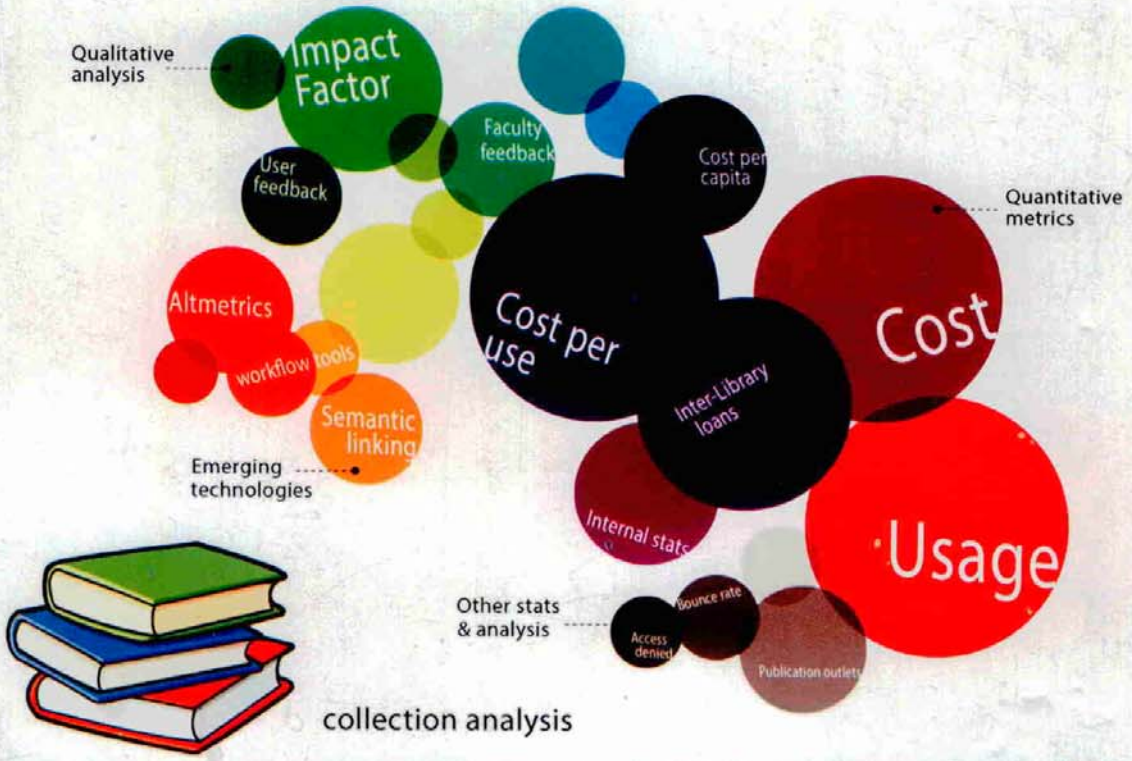
59th ILA International Conference

on

Managing Libraries in the Changing Information World: From Surviving to Thriving

Conference Proceedings



Chief Editor

Dr. B. Ramesha

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Yogendra Singh, Dr. N.S. Shokeen, Dr. O.N. Chaubey, Dr. Pardeep Rai
Dr. Pravin Kr. Choudhary, Ms. Hemavathi, Dr. Rishi Kr. Tiwari

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59TH ILA INTERNATIONAL CONFERENCE
ON
MANAGING LIBRARIES IN THE CHANGING INFORMATION WORLD: FROM SURVIVING TO THRIVING

Mahatma Gandhi Central Library,
Indian Institute of Technology, Roorkee
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2014

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FOREWORD

I deem it a great pleasure to pen the foreword to this volume of papers submitted to the 59th ILA International Conference on the theme *"Managing Libraries in the Changing Information World: From surviving to thriving"*. Next year it would step into diamond jubilee conference, and I wish it would be celebrated in a befitting manner. It would also be one of most gratifying event in its history and it is hoped that ILA will select a theme to mark that occasion and set a new revolutionary trend.

The theme of this International Conference is well thought of as Libraries, the legendary social and cultural institutions are on the cross road and on a turning point to reestablish their identity and strive for their survival. In this digital information deluge and with the advent of 'big data' era internationally information professionals are discussing on the survival of the libraries and expanding their horizon furthering their service to the society. Another most heartening expression of this conference is the venue of the conference - the IIT Roorkee, it has also a very commendable past which hails its genesis from the legendary "College of Civil Engineering" established in 1847, and probably the first of its kind in the country.

The conventional categorization of libraries as "Public, Academic and Special" is gradually on the vanishing trail and with the growth of the computer and communication networks the future can be visualizing a new paradigm "Integrated Library System". The libraries will have a new holistic image 'digital and/virtual libraries' and this would be one of the issue of change and of survival of libraries. There is need for a serious concerted approach to balance between them. Another area of concern is the advent of a new technologies like the 'cloud computing' 'big data' which are now being discussed on several platforms. In recent years the LIS professionals are writing extensively on digital libraries, RFID Technology, Web 2.0, and Open Source Software, Institutional Repositories and Scientometrics and Webometries. In this process the basic tools, techniques and methods of LIS which have a bearing of long term application and have been time tested are gradually disappearing from the profession. The advent of Free Open Source Software on Library Automation and Networking has diminished the knowledge of the basic approach through the systems analysis. The application of FOSS in libraries has brought some pragmatic changes no doubt, but the implementation has become very mechanical without much thought process on the study of cost-effectiveness of the change. On the other hand we have been discussing on the use study of e-resources and especially the Digital Library Consortia but the focus on the library use studies of print resources and other services has lost the sight. Our concentration is diverted to the build IRs but there was time when libraries were doing extensive documentation work of press clippings and news digests. It is observed from the sub-themes of the conference that areas like 'Knowledge Management' and 'Knowledge Organisation" is slated for discussion in the deliberations, but these subjects are closely related to information consolidation and repackaging and to the 'document description and representation'.

I wish the Conference a very grand success.

Bangalore
1st February 2013

(Prof. A.Y. Asundi)
Former Professor and Chairman
Dept. of Library and Information Science and Officer-in-charge, IT Centre, Bangalore University, Bangalore

PREFACE

We are happy to present this compendium of papers deliberated at the 59th ILA International Conference on theme "Managing Libraries in the Changing Information World: From surviving to thriving. The Indian Library Association (ILA) with its long legendry history and being the premier professional body of LIS professionals of India, has been organizing Annual conferences since its inception as one of continued educational objective. The coming next year, it would be its 60th Conference and a suitable theme would be on cards to mark that momentous occasion. ILA has always been considering the world wide thoughts that are implied on the changing role of libraries and there are contrasting and contradicting predictions being made on its survival and its very existence is feared in the digital era. This International Conference is discussing on several sub-themes which have been influencing of the changing role of libraries since last two and a half decades. This is aptly as "From Surviving to thriving", which shows that the impact of new technology is not a threat to their survival but act as catalyst to their flourishing. The courses of happening in the last two decades with the digital technology removing all bottlenecks of transformation of physical libraries, to virtual libraries and with the 'open system' trend setting in with the emergence of Web 2.0 the libraries have mapped a new landscape for their future and perpetual existence. It is now time to invest our thought on the areas that are influencing the libraries towards a new era and it has been a constant effort of ILA to bring these issues to the knowledge of the professionals in India. This conference has this aim and objective and with this thought in store for discussion has rightly chosen the theme.

The papers were invited from the scholars and professionals throughout the country and abroad on sub-themes as under.

1. Library and Information Science in Developing Countries
2. Managing the change in 21st Century
3. Innovative and Emerging Technologies
4. Human Resource Development for Managing the change
5. Copyright, IPR and professional ethics
6. Open Access to scholarly communication
7. Knowledge Management, Knowledge Organisation and Information Retrieval
8. Open Source Software
9. E-resources management

It is found from the contents of these sub-themes that several persisting issues will be discussed in the conference and it is hoped that the papers presented at the conference with resolve them suitably. The professionals at large are still not fully comprehended by the trailblazer technologies that are turning the libraries towards new imaginary and the visualization of such a situation is heavily blurred and unclear. It is hoped that the areas prescribed for the discussion in the technical sessions of the three day event will clear the clouds to some extent.

The volume consists of **165** papers scheduled for live presentation and **19** are slated for the poster presentation and abstracts. It is a matter of delight to know that papers are presented in all sub-themes and hoped that the delegates will be greatly benefitted with the scholarly content embedded in their presentations.

The Editors thank all the Authors for their scholarly and knowledgeable contributions and hope they continue to support the cause and mission of ILA towards continuous professional developments.

We heartily acknowledge our gratitude's and thanks to Prof. Ashu Shokeen, President ILA and all members of Editorial Advisory Board for assistance rendered in editing articles. We also extend sincere thanks to M/s Om Laser Printers, Delhi who has done tedious efforts in design, printing the volume in a presentable manner in a short span of time.

Thank you one and all

12th February 2014 EDITORS.

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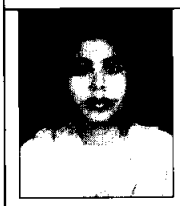
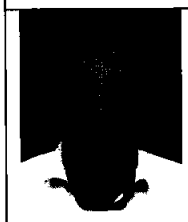
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Application of Web 2.0 in Library and Information Science: *A Needy Approach towards Automation*

Noor Bano **Afroj Alam**

Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better them ore people use it, consuming and remixing data from multiple sources, including individual uses, while providing their own data and services in a form that allows remixing by others, creating network effects through an architecture of participation, and going beyond the page metaphor of web 1.0 to deliver rich user experiences. A web 2.0 site gives its users the free choice to interact or collaborate with each other in a social media dialogue as creators of user generated content in a virtual community, in contrast to websites where users are limited to the passive viewing of content that was created for them. Examples of Web 2.0include social-networking sites, blogs, wikis, video-sharing sites, hosted services, web applications. The paper contains the substantial implication of the changing web as "web 2.0" for libraries and recognizes that while these implications keep very close to the history and mission of libraries. It describes the theory and definition to the practices of librarianship, libraries using these tools.

Web 2.0. Library 2.0. Face book. Flicker. You Tube. Copyright. Wikis and Social Networking Sites. Bulletin Board Service (BBS). Google Inc. Yahoo Inc.

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Citation Analysis of Pakistan Journal of Library and Information Science

Gurjeet Kaur Rattan



This study presents the results of citation analysis of all the articles published in the journal "Pakistan Journal of Library and Information Science" from the period 2006 to 2012. LIS professionals have used 848 citations for writing 40 articles during this period of seven years. Average citations per paper come out to be 21.2. So for as author pattern of citations is concerned, it is dominated by single authorship i.e. 59.55% of citations are single authored. The most cited form of citations is periodicals (51.42%) followed by other forms of citations like books (17.57%), web-sites (9.32%), theses (4.83%) and so on. Information Outlook is the most cited journal; it has been cited 44 times. The maximum citations (36.56%) are from the period 1999-2005. The percentage of e-citations is 15.45 and at the end a ranked list of cited journals has also been given. Bradford law of scattering has also been tested to this journal.



Bibliometrics; Citation analysis; Pakistan Journal of Library and Information Science; Bradford Law of scattering.

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Collection Development in Electronic Era

Lalita V. Khare



Collection Development is a crucial process in creating & building a library collection be it in an institution, college, school or a public library. It is a well designed activity for which a well defined policy is essential. The development primarily covered acquisition, selection, evaluation, preservation and weeding out materials/books/journals etc after assessing user needs. With the introduction of Internet and digital era, there has been a shift from hard copy format to digital formats .Accordingly the Collection Development Policy has been modified to include the digital content in a collection. Cost of building the collection have also to include the cost of technology and distribution of digital content also has to be revised.



Collection development, electronic resources, collection development Policy, Acquisition, Digital Era, Digital Resources, etc.

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Impact of Academic Performance Indicator on Authorship Pattern

Sanjay Kumar Kaushik



Teachers are the role model for the students in particular and for society in general. They are supposed not only to teach their students but also to contribute towards the research and development of their subject. To measure their performance there can be various methods such as the results of the students for teaching and the number of research publications in quantity and quality for research contribution. While implementing the 6th pay commission report University Grants Commission implemented a tool for measuring the performance of teachers in Colleges and Universities. This tool is called Academic Performance Indicator (API) based Performance Based Appraisal System (PBAS). With this tool the teachers and equivalent cadres in Library and Physical Education are evaluated during the process of their promotions and for direct recruitment also. The present paper is an attempt to find whether there is any impact of this tool on the number of publications made by faculty of M D University Rohtak during last decade. To conduct this study the data is taken from the Scopus database. The results indicate that during the last ten years the faculty had contributed nine hundred and four research contributions out of which 88% are in the form of articles in journals, 6% reviews, 5% papers in conferences and 1% others. While analyzing the data subject-wise it is found that Chemistry is on the top with 341 publications followed by Biochemistry (189), Phamacy (177) and engineering (105). Faculty also has foreign collaborations. South Korea(63) is the most collaborated-with country followed by USA(17) and Belgium(9). The top performer is Dr. C S Pundir(93) followed by Dr. A K Madan(55), Dr. Jagmohan(50) and Dr. J K Makrandi(50). Indian Journal of Heterocyclic Chemistry is the most favoured journal. It is evident from the results that 36% publications have been published during 2011 and 2012 that is after the implementation of API/PBAS in Haryana. The year-wise (starting from 2012) number of publications are 182, 143, 97, 63, 69, 62, 54, 73, 56, 55 and 50. The productivity of faculty has increased significantly after 2010. Hence I have enough reason to attribute this rise in number of publications as the impact of API. Secondly, while observing the authorship pattern in the form of single authorship V/s Joint-Authorship, no significant difference is observed after 2010. Still, joint authorship pattern dominate.



Research Contributions; Scientific Contributions; Scientometrics; Bibliometrics; Academic Performance Indicator

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Impact of Cloud Computing In Library

Nimbhorkar, S P **Zod, S J**



Today we are living in the age of information and with modern technology. Cloud computing is used broadly to describe nearly any type of virtualized computing environment where a library relies on a remote hosting environment for a major automation component. The objective of present paper is to study the impact of cloud computing on the modern education. The study also attempts the cloud computing one significant in the library services. Now a days information is available only on online and in digital format and need of information is high. So librarian should use the modern technology to store the digital information in a wide number which can be retrieving by various users.



Cloud computing, Library services, SaaS, PaaS, and IaaS.

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Knowledge Management: *Librarian as Knowledge Manager*

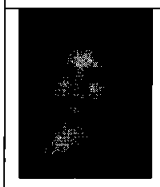
Archana Suroothiya

Abstract

This paper discusses the meaning of knowledge management. It explores how Information technology and related automated systems can support librarians endeavour towards better implementation of knowledge management. It mainly focuses on the concept of knowledge management and the role of Library and Information professionals in managing the knowledge. Increases in organizational information has created a great need to manage Knowledge to ensure effectiveness .Here librarian and libraries come into picture to play a key role in knowledge management process .Knowledge management in libraries and Information centres is concerned about how documents or the data may be organized, associated and retrieved so that meaningful information can be produced for a certain task. This paper also emphasises that librarian should train themselves and their staff to develop the appropriate knowledge management systems and use information technologies to equipped libraries to provide better, faster and pinpointed services to its users.

Knowledge Management, Information Technology, Librarian, Organized Information

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Management of E-Resources in Changing Scenario

Rajkumar Gajbe



We observed that Internet and Digital products has great impact on libraries amazing growth of electronics resources changed library operations dynamically that's why need of management of e-resources.

E- recourse, Management, Life cycle, User education

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Managing Digital Library with Open Source Softwares: *with Special reference to KOHA*

Ruchi Srivastava



With the growing technology, the challenges for librarians and libraries are growing with the same pace. Even the definition and role of library has changed for the diverse user community of the modern era. This paper discusses different open sources, different softwares available for libraries, initiatives by various organizations, advantages and limitations of open source, and detailed features of KOHA and its popularity in India.



Open Source, OSS, OSS for Libraries, Digital Library, Koha, IISERs, IISERB

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Ontology and Knowledge management

Rajani Meshram

Abstract

Knowledge management is not one single discipline. Rather, it an integration of numerous endeavors and fields of study. Ontology today is in many ways in a state similar to that of analysis in the late 18th century prior to arithmetization: it lacks the sort rigorous theoretical foundations needed to elevate ontology to the level of a genuine scientific discipline. This paper provides a overview of a number of key terms and concepts and also describe the role, uses and, types and principles of an ontology. Specifically, starting with some basic intuitions about ontologies and their content.

Knowledge Management, Ontology, Knowledge Organization, Engineering etc.

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Planning of Digital Repository in academic library: an overview

Mahendra K Sahu

Abstract: ***A digital repository is a device for organizing and storing digital content and accessed via internet, intranet. It supports research, learning and administrative activities of the institutions library. Now day's digital repository is highly essential for academic institutions for their research activity. This article given brief how to customize own digital repository to preserve the intellectual output and given access to the research scholar, student and faculty members of the institutions.***

Digital repository, resource for digital repository, Hardware/ software for repository/ Planning for repository / customization of repository.

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Radio Frequency Identification (RFID)

Rashmi Gupta **Shyam Bihari Gupta**



This presentation gives an overview of the current state of the art in the radio frequency identification (RFID) technology. Then it explores the brief introduction to the principles of the Radio Frequency Identification technology, current and envisaged fields of application, as well as advantages, concerns and limitations of use, comparison with the Barcodes Reader. This presentation concludes that RFID is a viable technology with many possible applications. However, only some of the impacts on organizations and society can be anticipated at present.



Radio-Frequency identification, RFID Technology for library Advantages & Disadvantages of RFID systems.

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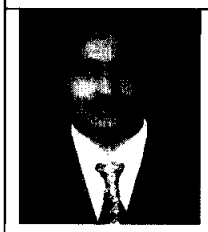
RFID - Application in Library

Vijay P Jadhao

RFID is the technology that is slated to replace barcodes in library application. It is a wireless data collection technology that uses electronic tags for storing data. It is based on microchip technology and the information contained on micro chips in the tags affix to library materials is read using radio frequency technology. In this paper distinguish that RFID'S advantages and disadvantages. it is better to study the system and plan it out properly. Hence guidelines to use RFID in library are also highlighted.

RFID technology, Bar code, RFID components.

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RFID: Modern Security Systems for Library

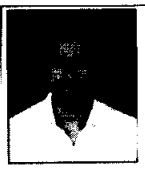
Praful Namdeorao Kadu

Abstract

Radio frequency identification is one of the fasted growing and most beneficial technology being adopted by the both industry and academia for increasing efficiency and improving the safety, security, productivity, accuracy and convenience. RFID the dedicated short rang communication (DSRC) system has been used in library for multiple purpose, it has provided a new way of success over bar coding and electromagnetic security system. In this article author has examined the potential of RFID in the sense of cost effectiveness safety, security and its other aspect.

Radio-Frequency identification, RFID Technology for library Advantages & Disadvantages of RFID systems.

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RFID Technology in the Modern Library

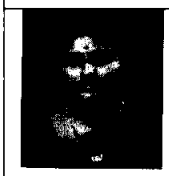
Sunita Shivaji Patil

Abstract

This paper have described about the requirement of libraries to sail with the current technology in order to provide effective and efficient services. The paper presents the in and out of RFID technology for the library and information system management. It gives a complete insight about the components and the application of each component in the library and how by implementing such a type of technology, in libraries the man power, energy, time duplication of work, and efforts can be saved .At the end highlight the advantage and threats of the technology.

RFID application, Automated Library system (ALS) ,Smart Card.

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Role and Challenges for Leadership

Om Pal Singh **Sandhya Rani**

Abstract

This paper is based on the concept of role and challenges for leadership. In 21st Century the leadership will become more important to the profession. This leader of future will be more than a good manager or someone who has attended the right course. A leader must have the experience, vision, integrity and an understanding of the potential of the organization and the people within it, desiring to take his/her place as part of the profession.

Leadership in library/organization, role of leadership, challenges for leadership

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Role of Digital Libraries in Modern Day Education System

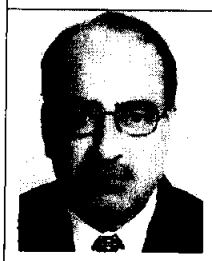
Hasan Jamal Abidi

Abstract

Digital Libraries act as the new source of knowledge in today's digital age so it only makes sense to closely studey and examine the effect of digital libraries and ebooks on the modern day education system. This paper is an effort in this direction and builds upon my previous papers on digitization of libraries and significance of ebooks and digital libraries in the 21st century. The traditional education system is bound to be affected by the changes in the way people perceive and obtain information. The most common way has been traditional books mostly available in libraries across the world. With the advent of new technology and increasing populaity of smart phones and tables, it is imperative to fully comprehend the corresponding change in the way information is retrieved and utilized specially by today's youth. Education system around the world has been greatly impacted by the options available today to share knowledge and fetch information through the digitization of resources and easy availability on the internet. This is an exciting time for the field of education as it opens new possibilities leading to reduction in cost, effective transfer of education, collaborative learning and much more. This paper tries to identify the trends and establish protocols around the utilization of digital libraries in the field of education

Radio-Frequency identification, RFID Technology for library

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Study of Impact of Information Technology on College Libraries in A.P

Bala Theresa, T **Revathi, G**

Abstract

Information and Communication Technology (ICT) is changing the work of libraries and information centers. Library automation activities are gaining momentum throughout the state. It is quite a good sign that SOUL – Software for University Libraries, is now available at an affordable cost as a comprehensive library automation package. However, librarians should be prepared to meet the challenges. They should acquire adequate knowledge about the hardware and software options available. All libraries should use standard software packages for automation and database creation to facilitate the exchange of bibliographic records between libraries. Databases may preferably be created in the MARC21 format because most libraries at the international level follow this. There is need for continuous monitoring of automation activities for improvement of the situation and for meeting the future needs. Therefore, it is concluded that the Status of computerization of library housekeeping operations and computer based library services of college libraries is in nascent stage. This study investigates the effect of information technology on college libraries and librarians. The report presents the analysis of data gathered through the questionnaire designed for the study. The questionnaires were circulated to Engineering colleges, Under Graduate colleges (both government and private). The respondents include both rural and urban colleges. Data collection was carried out through the informal method, user survey, and formal interview method. And the percentages are calculated to show the comparative analysis of the findings.

ICT, Information Technology, MARC 21, Library Automation

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The Role of Digital Libraries in Higher Education

Manmeet Kaur, **Rameshwar Dayal** **Pratibha Kathait**

Abstract

In today's world education is very important. Library plays an important role in for providing the better education; because we all know that libraries have a reservoir of knowledge. Printed Books are being converted in digital/electronic format in present time. Current generation is using technological products much more. Due to information explosion and busiest schedule of society; all want to complete much work at less time. With the help of technology, traditional libraries are going to up to date as per user's requirement. This work addresses some aspects of digital libraries that make them suitable to support higher education.

Higher Education, Digital Libraries, Education, Electronic theses and dissertations

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User Awareness towards Using E- Resources in Uttarakhand based Academic Libraries: *a Study*

Pandey, S N et. al



This article evaluates user awareness towards electronic resources by the users of academic libraries of Uttarakhand State with an objective to ascertain as to what extent internet as well as other traditional resources is being used in Academic environment. A study was conducted in Academic libraries to know the use of different electronic resources by faculties, Research scholars and students. The data was collected using questionnaires. Internet was found to be first extensively used E- resource to keep themselves up to date. This study also examines the problem faced by the users in accessing the E- resource and human interest towards the use of internet and Google search engine & finally paves the way for Academic libraries to plan and provide their services in a better way. The paper explains that the most of all respondent use internets for Email and use Google search engine where internet facilities are available. This paper reveals the different solutions and enhancing good efforts for positive direction also.



E- recourse, E- journals, E-databases, Search engine, Internet, Academic Libraries , Electronic Information Services, Library Management, ICT, Information Technology, Uttarakhand State.

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Benchmarking of Practices in Academic Libraries

Manjunatha M



The paper is about how to enhance the overall performance of academic libraries by adopting the best practices in every area of the services process. These best practices can be designed benchmarks and the same can be considered as standards for every activity in the context of Academic libraries.

Best Practices, Academic Libraries, Benchmarking

1. Introduction

Benchmarking is an ongoing, systematic process for measuring and comparing the work processes of one organization to those of others that exhibit functional "best practices." The goal is to provide an external standard for measuring the quality and cost of internal processes, and to help identify where there may be opportunities for improvement. To be effective, benchmarking should be integrated into operations throughout the organization and should be an ongoing process that analyzes data collected over time. It is a learning process that helps institutions discover how they can best improve the services, direct or indirect, that they offer to their users.

2. Process of Benchmarking

Benchmarking looks at how others achieve their performance levels and examines the processes they use. There are many different approaches to benchmarking, ranging from models of quality measurement to basic, pragmatic comparisons. Many organizations have an approach tailored to their own organizational goals and business needs. There are four key steps to any benchmarking process:

- Obtain a detailed understanding of existing service processes
- Analyses the business processes of others
- Compare 1 and 2 to find gaps
- Implement the steps necessary to close the gap

3. What is Benchmarking?

Benchmarking is an Academic technique to improve service performance. It is used to compare performance between different organizations or different units within a single within a single organization undertaking similar processes. It is an ongoing method of measuring and improving product, services and practices against the best that can be identified in any institute anywhere.

4. Why benchmark?

- To provide a reference point for our current approaches
- To ensure that the standards we aim for are set at an appropriate level
- To convince us we can do better
- To assist as a mechanism for measuring performance and ensuring improvement
- To counteract our tendency to be internally focused, by adding perspective and objectivity
- To assist in identifying best practice
- To improve process

5. The benefits of Benchmarking

Benchmarking enables organizations to compare their performance and approach with others and to identify elements that can be adopted and adapted in their Services. It can be a one-off event or a continuous process where organizations continually challenge and improve their practices.

- Increased competitiveness
- Improved professional relationship
- Proof of Library's value to the organization.
- Better and faster decision making.

6. Benchmarking in Libraries

Librarians in the public or private sector throughout the world have been encouraged to follow their institution's lead and conduct benchmarking studies to prove their value to the institution. Most of the librarians have started to comparative benchmarking study used mainly for justification purposes. Librarians can use internal and external benchmarking to improve their process and prove their 'value' to the organization. The key to benchmarking is to see what is being done differently and to assess the value of those differences to the library.

- **Internal Benchmarking:** In this method librarians benchmark their library against others in their organization or library system. way to involves the following steps:
- Identify internal benchmarking partner
- Collect an analyses the benchmarking data
- present results to management
- Develop Benchmarking measures
- **External Benchmarking:** External benchmarking allows librarians to witness, firsthand the work process of the libraries.
- Librarians measure their target library process that needs improving ;
- Other libraries measure the same Library process in their libraries
- Librarians adopt partner's best practice

7. Recommendations

The Benchmarking Team recommends several changes in procedure for future benchmarking projects:

- Try to garner grass-roots input in choosing a project, perhaps by issuing a call for proposals to all staff. This would help ensure interest among team members and cooperation in implementing changes at the level at which the changes would be made.
- Provide a basic how-to training class that can be used on demand for new groups embarking on a benchmarking project.
- Enlist original Benchmarking Team members to provide assistance as consultants/coaches for other groups wanting to benchmark a process or Services.
- Libraries should use Digital Software, and are Digital Library.
- Libraries should have technically qualified and non technical staff.
- Provide a support person to assist with compiling data, making travel arrangements, etc.
- Allow team members time away from their regular jobs, with someone assigned to help do the tasks they normally do.

8. Conclusion

Benchmarking is a complex process requiring a genuine search for improvement on the part of the initiating institution. A significant investment of time must be made to identify strategic areas for benchmarking, select individuals to participate in the benchmarking process, determine appropriate and meaningful measures, justify the processes selected, discern the best comparators, collect significant data for comparison, make the trip, and introduce the changes back into the organization. Although some processes will lend themselves to continuous improvement, others may require fundamental restructuring or even outsourcing. Work redesigns, whether incremental or radical, must be fully implemented in the organization before the project can be judged a success. Thus, although the formal benchmarking process can occur rather rapidly, the changes that benchmarking introduces into the culture of the home institution can be profound.

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Changing Role of Library Professionals in the ICT Environment

Namita Khot

Abstract

This article aims to help library professionals to cope with the tremendous change in the librarianship due to the revolution in ICT. The support of electronic services requires special skills and competencies. Today libraries are emerging as information resource centers, performing electronic cataloguing, electronic acquisition and serial control, electronic circulation functions. This article shows how librarianship has changed from traditional aspect to technological aspect. It also puts forth the competencies and skills required by the library professionals to manage the changes.

Librarianship, ICT competencies, Skill, Library Professionals.

1. Introduction

The Library is an important instrument of education. In the changing educational environment in India, the role of libraries in education, especially in higher education is very significant. The traditional concept of libraries which was completely based on print media is changing towards digital /electronic form with the help of information technology. In today's high-tech learning environment, the library as a learning resource is taking up increasingly more academic space and time in a life of a learner. The primary function of the library is to create awareness & initiate the students to feel library is an integral part of their career. The core objective of the library may evolve its collection & services mainly to reflect the curriculum requirements of its users. The technological development has made tremendous impact on every profession including librarianship. The library professionals have to cope up with the proliferation of information as well as high expectations of users. The new innovations and innovative ideas including artificial intelligence, robotics, CD/DVD-ROM, Networking, Barcode systems, RFID, Cloud computing all this comes under the Word Information Communication Technology i.e. ICT. There has been sea change in the librarianship due to revolution in ICT. "Librarianship is the professional activity of selecting, procuring, organizing preserving and making available data, information and creative and scholarly words and providing services that assist and instruct people in the most efficient ways to identify, locate, access and use information and resources. The increasing role of technology in libraries has a significant impact on the changing roles of the librarians.

2. Traditional V/S Technological Librarianship

Sl. No.	Statements /	Traditional Librarianship	Technological Librarianship
1	Regarding Collection	Storehouse of documents. Only Accessioning, Organizing retrieving & disseminating information in print form.	Change from paper to electronic resources because of ICT. Apart from regular processing of print form, Nonbookmaterial should be processed for dissemination
2	Collection Development	1. Only books & journals collection to be developed	1. Not Only books & journals but they have to deal with all the new formats of e-resources. Collection development of e-databases in the form of full text e-journal or bibliographical databases
		2. The print media is synonymous with common user & the same is valuable heritage also	2. While dealing with electronic media librarians have to deal with " access without ownership "issues involving E-product license agreements.

3]	Circulation	Simple Issue Return	On line service & as well as offline service. All the e-resources should make available where & when they are needed.
4]	Reference Service	Serving users to give traditional reference services in the library	Librarian has to serve through internet or online facilities along with traditional reference services. But providing online reference service is time consuming
5]	Referral Service	Traditional services like CAS, SDI.	Readers can be guided to refer another library through web OPAC
6]	Marketing Of Library	Through sigh boards, Guide boards, Information Brochure etc.	Web portal is a standard tool for marketing of services. Digital library services, electronic services can be provided through Web portal
7]	Role of Librarian	Custodian of reading material	Not only custodian but also collector & evaluator of information. So he acts as a information manager/information scientist

From all the above points it is seen that the traditional role of librarians as the custodians of their physical holdings is changing into one being responsible for the security of their electronic information as well a long with the system administrators. So library professionals have to be dynamic and well equipped with new technology. Librarians have to prepare their libraries in such a way so as to offer 24/7 anytime, anywhere access to the libraries. The librarians also have to redefine their roles and responsibilities according to the need of the hour i.e. from merely book keeping role of librarian to the information scientists who are managing the knowledge.

3. Skills required by the librarians in ICT environment

To meet the changing needs of library users, librarians are expected to continuously enhance their competencies and skills in the use of technologies in order to improve productivity, efficiency and competitivenessTo day we see that IT professionals who do not change with the technology always lag behind. Similar danger is observed over the shoulders of library professionals & Librarians must keep pace in developing their own competencies.

4. What are the competencies?

Competencies have been defined as the interplay of knowledge, understanding skills and attitudes required for doing a job effectively from the point of view of both the performer and the observer. The unique competencies of the librarian include in depth knowledge of print & electronic information resources in management of information services that meet the strategic information needs of the individual or group being served.Therefore every librarian working in this ICT environment should have the following competencies or skills-

- **Communication Skills-** The librarian is required to acquire communication skill for correspondence as well as oral communication. He should acquire competencies to function as a manager, organizer, leader, supervisors & Communication with different groups of people. Various sales agents for marketing of there products related to automation & Services of libraries approach to librarians from all over India. Therefore librarian must have competency to talk with them in English of Hindi.
- **User-Orientation Skill-** Orientation for user is the prime need of the libraries for smooth working of library. It helps users with the needed skills to enable them to make use of libraries & their resources in a user friendly manner. Librarian must be competent for using wide variety of methods to help users in information skills through lectures, practical sessions, printed guides, PPT presentations etc.

  ICT Skills- Information technology is developing day by day in all libraries & Information centre's .Therefore library professionals must have enough skills to handle these new technological

developments. He must have basic knowledge of handling computer along with LAN, WAN Networking and internet use. He should have enough skill to acquire knowledge of benefits & various schemes provided by library networks and consortia such as INFLIBNET, INDEST and DELNET.

- **Technology Acquisition Skills-** Librarians should have enough technical knowledge about how to use any machinery like computer, photo copier, scanner, printer etc. however technology is developing day by day, new IT applications are coming in market. So librarians should have skills and competencies in locating information about the latest technologies. They should have enough technical knowledge to discuss and bargain with the vender and take decision for suitable technology.
- **Information Retrieval Skills-** For providing various online services library professionals should be competent in using online database. He should have an ability to think in a logical and analytical manner to be effective in searching the databases. He should help users with comprehensive retrieval, bibliographic verification & SDI.
- **Information Repackaging Skills-** Because of information explosion lot of information is available in the various forms of resources. But these resources are just tools which have little significance. Unless and otherwise we apply them to create & improve products & services they do not become meaningful. Librarians are expected to provide value added services by carrying out searches across range of information resources, download the results, analyze and again repackage to suit the user need. Now a day librarians are also expected to develop specialized information products like databases of in-house products, searchable full text document files, create web page of library, develop institutional repositories etc.

Other than all the above technological competencies Librarians should have following basic skills-

- **Collection Development Skill-** Development of collection in this IT era is very challenging activity for library professionals. The selection of resources must fulfill the current needs of their users but also be capable of catering to the future ones. Hence librarians should have thorough knowledge of full range of current resources, both print as well as non print. They must keep them up date regarding the best textbooks, reference books, journals, electronic resources in specific areas while purchasing. They should know what is relevant & usable for the users.
- **Collection processing skills-** Librarianship attempts to relive the users from literature search activity by understanding the intellectual activity of evaluating, integrating, condensing & making available the latest required information. This requires a logical and analytical approach on the part of librarian, so that information needs of the users obtained could be analyzed & needed information be provided.
- **Managerial Skills**-Managerial Skills like planning, designing, developing and implementing are essential for efficient workflow and production. Technological librarianship needs knowledge of total quality management as well as human resource management.
- **Interpersonal Skills-** For effective librarianship librarians have to enhance their leadership ability. A leader should have identity, authenticity, open mindness, independence, responsibility, communicating, reasoning and problem solving abilities, maturity, clarity of mind and expression etc. He must encourage & inspire his colleagues to give their best to achieve a desired result. Leadership is one of the most effective tools of management and organization effectiveness depends on the quality of leadership.

5. Conclusion

Twenty first century is an age of digital functions. Information technology has made drastic change in the every field. Universities & other higher education institutions are undergoing rapid change

on the teaching and the learning process mainly because of e-learning. Library and information services can not lag behind and also require changing to the tune of the progress of the civilization, keeping in view the requirements of time, technological developments and global change. The competencies & Skills form the basis for the continued survival and growth of librarianship in the information age. Libraries must recognize the expanding nature of the challenge that confront them and the range of competencies that are required to ensure that the librarians have a viable tomorrow.

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Changing Trends of Job Opportunities and Employment for LIS Professionals in India: An Analysis of Job Advertisements

Manoj Kumar Sinha **Brojesh Kumar Pandey**

Abstract

The present study aims to identify and assess the job opportunities for the professionally qualified LIS professionals in the area of Library and Information Science. The data required to carry out the study have been collected from the printed weekly issues of 'Employment News' and the 'LIS Link: a 'LIS Job Portal'. The data collected have been represented through tables and figures. The data collected have been analysed to reflect the different aspects of LIS Profession, such as month wise, state wise, category wise (whether reserved or unreserved; teaching or non-teaching position), nature wise (whether permanent or temporary), source wise, level wise distribution of advertisements. Moreover, a preliminary data was collected after scanning the available literature and data pertaining to the number of library science graduates produced every year and their employability.

Job Advertisements, Job Opportunities-India, Librarianship, Print and Electronic, Media, LIS Professional-India

1. Introduction

Due to the rapid growth in the number of learning institutions all over the country, the necessity and the importance of libraries is also growing. Moreover, with the industrialisation, economic and social growth, many new professions have emerged in the last two hundred years. More particularly the 20th century has witnessed the growth of hundreds of new professions. Librarianship is one such profession that emerged in the 19/20th century when corpus of knowledge multiplied geometrically requiring rapid expansion in its nature of work and services of knowledge organisation, retrieval and dissemination. Thus, librarianship is a growing field, which has by now attained the status of a separate discipline in the universe of knowledge. With the introduction of information and communication technology, the definition of the Library as well as the Librarianship has changed. Earlier, the Library was considered as the store house of books and the Librarian, as the custodian of books. But now, the role of traditional librarian is fast evolving from the custodian of books to a facilitator who locates the right information. It is one of the duties of the Librarian to help users to find the right information at the right time as per their requirement and use it effectively and efficiently

Library & Information Science (LIS) courses have lot of potential to develop the knowledge and skills required to sustain and survive in the present day knowledge society. Globalization and liberalization has opened up multiple career options to the LIS professionals. The traditional roles of LIS have changed with the advances in Information and Communication Technologies. LIS professionals are expected to be academics of higher order with competence to work in a hypertext, networked, digital environment. Hence, the LIS education should impart the learners, the necessary skills to gain employment upon graduation and to develop the vision and understanding to help them cope better with the rapidly changing world. Now days, a number of career prospects are available in Library and Information Science. The qualified and trained professionals are employed in various libraries and information Centres. LIS professionals can select the type of library as per their own interest. Thus there is a very bright future prospect for LIS professional. And only the trained personnel in LIS can have employment opportunities in the various sectors.

2. Statement of the Problem

The statement of the problem of the study is entitled as "**Changing Trends of Job Opportunities and Employment for LIS Professionals in India: An Analysis of Job Advertisements.**" A comprehensive study on the job advertisements published in different media for the LIS professionals during the year 2011 is made. The introduction of ICT widens the areas in Library and Information Science. The Job Prospects thus, for Library and Information Science Professionals covers a huge area. Career in LIS is multidimensional, ever growing and bright. Besides, the last two decades have definitely witnessed the tremendous change in the library science profession and education system in India. With the advancement of IT, different new designations have evolved for LIS professionals. Thus it is very important to study the job opportunities for LIS professionals for fast dissemination of advertisement. The study aims to create the statistics of the job on various aspects and asses the demand for the Library Professionals in recent times. It is hoped that the study will be benefitted for both the LIS students and LIS professionals and let them know the market demand for the LIS professionals under various designations and the required qualifications and skills and also the need for further education and training.

3. Objectives

The main objective of this study is to present the statistics of the job on various aspects and asses the demand for the Library Professionals in recent times. With this main objective following are some allied objectives of the study:

- To analyse the trends of job opportunities for Library and Information Science Professionals on most diversified technological environment;
- To study the LIS job advertisements applying various study criteria like Month wise, State wise, Source wise, Category (Reserved/Unreserved; Teaching/Non-Teaching) wise, Nature (Permanent/Temporary) wise, Level wise etc;
- To present the current status of job opportunities for library and information science professionals at the national level in general;
- To assess the demand for the LIS professionals in the job market; and
- To know essential and desirable competencies, and other skills that employers advertise in jobs for the positions of professionals.

4. Scope of the Study

The study is conducted on "**Changing Trends of Job Opportunities and Employment for LIS Professionals in India: An Analysis of Job Advertisements .**". The study is confined to LIS Professionals in India. The media discussed for this study is confined to print version of the Employment News, and the LIS Job Portals mainly the LIS Link (http://www.lislinks.com). The study is also restricted for the year 2011. Some other media like some regional and national newspapers are also discussed. Care has been taken to cover and include all the advertisements published for LIS Professionals from the mentioned sources.

5. Delimitation of the Study

The present study was delimited to the two sources of information from where data pertaining to job opportunity and employment has been collected. These two sources are 'Employment News' and the 'LIS Link'. But there are many other national and regional print as well as electronic media which have not been consulted. There are many leading private and other institutions which sometimes may publish their advertisement in regional and other national newspapers. So, these types of advertisements have not been included in the present study due to paucity of time for completing this survey and analysis work within few months.

Thus the present study has been delimited to the job advertisements published in Employment News and LIS Link, and LIS Job Portal during the period January 2011 to December 2011. Due to the paucity of time, advertisements published in other media have not been taken into account. This may be taken as a pilot study to carry out the same study at large scale to draw some important findings pertaining to generation of fresh LIS graduates and giving job opportunity to them to earn their livelihood from the novel profession of supporting teaching -learning activities of the academic communities.

6. Review of Literature

Review of related literature is conducted to enable the researcher to get a clear understanding about the specific field of study. It also helps the researcher to have an insight into the tested methods, procedures and interpretations of similar studies conducted elsewhere. Due to paucity of space and limitation of words, the review of literature has been not given in this paper. For details of review of literature, authors may be consulted.

7. Research Methodology

Qualitative research methods are being used to conduct this study. This study is descriptive in nature with main objective to analyze the library job advertisements in Govt. and Non Govt. sectors of India to understand the nature and conditions of the job requirements set by the employers and other hiring agencies and the market trends in the era of technological advancements.

The Job advertisements advertised within the period from January to December 2011 have been selected for this study. The sources of these advertisements are mainly leading National and Local newspapers; especially the Employment News and the LIS Link which is a LIS Job Portal. Most of advertisements are downloaded from these sources or their reference were noted down and later searched from the newspapers. The data entry is done in MS Access and further the data has been tabulated and graphs have been prepared using MS-Excel and these data has been analysed to come upon generalised findings and a meaningful conclusion is drawn.

8. Data Analysis and Interpretations

The required data for the present study has been collected, during the period from 1st January 2011 to 31st December 2011 which has been analysed and interpreted using Content Analysis method. Content analysis is a research technique used for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use (Krippendorf 2004).

In this study, the required data has been collected mainly from two sources; viz. 'Employment News' and 'LIS Link' which is a LIS Job Portal. During the period of the study, the advertisement published in the weekly newspaper "Employment News " has been scanned and a total of 50 issues of Employment News between the above mentioned periods have been consulted and analysed for the purpose. Moreover the LIS Link, a LIS Job Portal have also been consulted and the required data between the period of study has been collected and analysed for arriving to the important findings as per the requirement of the objectives. Details of data analysis along with tables have been not included in paper due to space problem in the conference proceedings. Only major findings suggestions and conclusion have been given in this paper. Author may be consulted for details.

9. Major findings, Suggestions and Recommendations

9.1. Major findings

Based on the analysis and interpretation of data following findings are drawn from the study:

- **Media / Sources where Advertisements Published:** The entire study is conducted using the two sources, i.e. the Employment News and LIS Link, an LIS Job Portal. From the content analysis of the two sources, during the periods from January 1st to December 31st for the year 2011, it is found that out of a total of 277 number of posts advertised in the two mentioned sources, 139 (50.18%) number of posts is advertised in the Employment News, 102 (36.82%) number of posts is advertised in the LIS Link whereas. 36 (13%) number of posts advertised is found in both the two sources.

- **Month Wise Distribution of Posts:** While consulting the two sources, it is found that the frequency of distribution of number of posts advertised in different months is different. It is found from the study that that maximum no. of posts is advertised in the month of February, January and March respectively. Out of a total of 277 posts advertised , maximum (56.= 20.21%) number of posts are advertised in the month of February, which is the highest in the year 2011 which is followed by January (52 = 18.77%) and March (47= 16.97%). Whereas very less number of posts is advertised in the month of April, August and October (9 = 3.24%) posts are advertised in each of these months.

- **State Wise Distribution of Posts:** Moreover the study also reveals that the frequency of distribution of the published advertisements also varies State wise. It is found that out of a total of 28 states in India, the advertisements for the LIS professionals are published from 24 States. The highest no. of post for the LIS professionals is advertised for Delhi. Out of a total of 277 no. of posts, 96 no.(34.65%) of posts are advertised for the libraries and other govt. and non govt. institutions located in Delhi which is followed by Uttar Pradesh (38=13.71%), Madhya Pradesh (22=7.94%) and West Bengal (21=7.58%).Few no. of posts is advertised for Arunachal Pradesh, Assam Goa, Jharkhand, and Karnataka. Very few no (1 or 2) no. of posts is advertised for these states, the percentage for which being the 0.36% & 0.72%.

- **Category Wise Distribution of Advertisements:** The study also reveals the Category (Reserved/Unreserved) wise distribution of frequency of no. of posts. A good no. of posts advertised is reserved for different categories such as OBC, SC, ST, and for PH candidates. Out of a total of 277 no. of posts, 73 no. (26.36%) of posts is reserved for these different categories. And the rests i.e. 204 nos. (73.64%) of posts is unreserved. Out of the total reserved posts, the highest nos. (33=11.91%) is reserved for OBC candidates and the least nos. (5=1.8%) is reserved for Physically Handicap candidates.

- **Designation and Level Wise Distribution of Advertisements:** The study also shows the Designation wise frequency of distribution of no. of posts. Here the various posts published under different designations are included under 19 different designations. It is obtained from the analysis part that under variety of designations, the highest no. of posts is advertised for the designation, 'Library Assistant/Cataloguer'. A total of 40 (14.44%) no. of posts out of 277, is advertised under this designation which is followed by 'Library and Information Assistant' with 39 (14.07%) and 'Library Attendant' with 33 (11.91%) no. of posts. It can also be seen from the above table that only 2 (0.722%) posts are advertised for 'School Librarian' which is the least no. of post advertised under any designation.

- From the study it is found that, the various posts advertised under different designations are of two natures; either of Permanent or of Temporary/contractual nature. The frequency of total no. of posts is distributed between these two types of nature. It is observed that out of a total of 277 no. of posts, 230 nos. (83.03%) are of Permanent nature and the remaining 47 no. (16.97%) of posts are of Temporary nature.

- **Level / Ranks / Hierarchy Wise Distribution of Advertisements:** The job advertisements published are for different levels of LIS Profession. The advertisements published for various posts are distributed among three different levels, i.e. the Top level, Middle Level and the Bottom level. The various designations like Librarian in different institutions/organisation, Deputy

Librarian, Assistant Librarian, and the higher administrative posts are included under Top level. Designations such as PA, SPA, Library Assistant, Information Scientist, etc. are included in the Middle level and the designations such as Library attendant; Library Clerk, etc. are being included under the Bottom Level.

- It is found through the study that out of the total no. (277) of posts, 122 nos. (44.04%), are advertised for Top level; 82 nos. (29.60%) for Middle level and 73 nos. (26.35%) of posts are advertised for Bottom level.
- **Category Wise / Type of Job Wise Distribution of Advertisements:** In the Library & Information Science profession, there is the availability of both the Teaching/Non-Teaching type of jobs. Thus here, the total no. of posts advertised for LIS Professionals are distributed between Teaching/Non-Teaching categories. The study reveals that out of a total of 277 no. of posts, maximum no. of posts (259 = 93.5%) is advertised for non-teaching profession and few nos. (18 =6.5%) of posts are advertised for Teaching profession.
- On the basis of available data, every year in India, 2099 nos. of students get admitted in various courses like BLIS, MLIS, M.Phil./ Ph.D.
- Assuming 75% success rate, 1574 students pass out every year from various universities in India. But the no. of post advertised is only 277, which is only 17.60% of the total pass out students. This indicates that there is a huge gap between the Library Science graduates produced and their employability.

10. Suggestions and Recommendations

Based on the entire studies and analysis with the available data, the following suggestions can be made so that more and more jobs can be tapped by the LIS Professionals:

- There should be any mechanism which must be developed so as to track all the advertisements published for various institutions to different localities and also it must be maintained regularly.
- It is observed that the ratio of candidates acquiring LIS degree and their employability is 5:1 (approx.). Thus the ratio indicates a huge gap between the entities. On the basis of this, the following points can be recommended:
- The government should take initiative to create and recruit vacant positions for different institutions/organisation as and when necessary. The government should also pay attention to fill the different vacant posts in various institutions.
- The government, particularly the State governments should pay their attention to Public Libraries. State governments should implement Library Legislation so that as much posts can be created for public libraries.
- No further new Department for Library Science should be opened. There should be a regulatory body to monitor the syllabus, intake capacity, infrastructure for existing and emerging institutions offering Library and Information Science courses.
- There should be a Professional Body to look up the matters such as the advertisements published annually for Library Science Professionals, emerging human resources and the requirements.
- The Professional Library Associations like ILA, IASLIC, etc. should also collect and maintain records from different institutions and organisations about their library positions, their requirements, etc. and they should work for the well-being of Library Profession.

- To meet the current challenges in view of implementation of ICT in Libraries, the Library Science Schools in India should constantly upgrade their curriculum and train their students in such a way so that they can cope up with the emerging trends and can compete and sustain in this new environment.
- Moreover, the Library Professionals should see new avenues and new job areas such as in corporate sectors for their survival as IT Professionals are coming in our way to grab our job, if LIS Professionals do not make themselves fit in the new changing environment.

11. Scope for further Research

Due to the limitation of time, the researcher is unable to scan the newspapers published from different regions and localities. The work is carried out by consulting The Employment News mainly and partially the LIS Link. Thus the work is done on a small scale and a rough idea is produced. However, the work can be done on a large scale by scanning various sources of advertisements published from different regions and localities and also consulting different available LIS Job Portals, a relevant and a clear picture of the work can be arrived at. Moreover the work is done for the previous year (2011) only, which may be taken as a Pilot study for the further and preceding years. The same study can be done on last 5 years or 10 years to come on the concrete results/findings.

12. Conclusion

This is a preliminary study taking with consideration of advertisements published during the year 2011. This may be carried out over the period of 5 years or more to get a reliable picture for intake capacity of students and how many students are getting jobs may be analysed and discussed in details. It is very interesting finding that many universities have been offering LIS education at different levels (BLIS, MLIS, and M.Phil. /Ph.D. levels) but number of post for teaching positions are comparatively published in very less numbers which shows that teaching posts are perhaps not created in sufficiently or posts are perhaps kept lying vacant on account of various reasons, which needs a further investigation.

It is further suggested that more numbers of posts for teaching positions should also be created so that fresh NET and Ph.D. degree holders may get job for teaching or research. It has also been observed from the present study that number of vacancies for JRF/SRF have not been published during the year 2011, which needs serious attention from the university departments to bring more number of projects to engage fresh JRF/ SRF /RA for research in the area of Library and Information Science. The universities have been taking steps for opening NET Coaching centres for the students who want to appear at the Net examinations. The fresh LIS students pursuing MLIS course should be courage to attend the Net coaching centre and try to qualify NET/JRF exams conducted by UGC or SLET conducted by different state governments which will give an opportunity to serious MLIS passed out and Net qualified students to pursue research programme in universities.

From the data available for intake capacity for BLIS, MLIS, and Research Programme and number of fresh graduates who are passed out, it was found that the number of posts advertised for LIS jobs are very less when we compare it with the availability of job avenues / opportunities in LIS profession. Form the above findings it is evident that production of fresh graduates are more in comparison to the number of jobs available in the LIS job market which creates a serious problems for the LIS Professionals to in searching suitable jobs for themselves. There is a great competition amongst the LIS professionals to get job which needs attention of the State as well as Central Governments to create more job avenues for the LIS professionals in schools , colleges , universities, institutions Therefore the Government of India and the respective State Governments should also create/ sanction requisite number of posts in different Schools, Colleges, Universities, Institutions, Rural and Public libraries , Corporate sectors etc so that more and more fresh graduates may be appointed in the state and central governments educational institutions and public/ rural libraries and other government departments and ministries and special libraries. It is hoped that during XII plan , more and more posts will be sanctioned in the educational institutions while implementing the

recommendations of the National Knowledge Commission. The future of LIS professionals is bright and library profession sector would give more job avenues to the fresh library science graduates, post-graduates, and certificate, diploma degree holders in the coming years to come. There would be also more job avenues in the higher educational institutions like colleges , technical institutions , colleges and universities for higher as well as lower level posts.

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Creativity, Development and Innovation in Libraries

Lata Suresh **Pravin Kr. Chowdhary**



Library is a social institution entrusted with the sacred responsibility of collecting, organizing, preserving and disseminating knowledge. Due to phenomenal growth in information at an exponential rate, there is a 'paradigm shift' and the accessing and utilization of vast amount of information has become the major concern. Developments in computers and communication technology have revolutionized the modes and methods of information storage and retrieval. In fact the impact of information technology is visible in each and every activity of the library. The journey of a document right from its selection, acquisition and technical processing can now be planned and monitored in a much more effective manner. There is hardly any function of the libraries where IT has not shown its impact. The present paper discusses the developing skills for innovation in Libraries and how changes can be sustained and embedded in practice.



Creativity; Innovation; Digital Age; Role of Librarian; ICT Application; Competencies;

Introduction

The advent of the new millennium has been prefaced by a previously unknown expressed dissatisfaction. Users have become increasingly empowered and articulate in questioning in relation to both professional expertise and inadequate and poor quality service provision. Innovations and change are set to be integral component in the development and delivery of services rendered by a library. Creativity in libraries means adopting and implementing new ways of thinking in order to change the ways libraries work. This calls for a need to rethink and perhaps reject routine ways of working to question traditional approaches to problem solving and to adopt a willingness to work outside the conventional boundaries. Innovations and change are set to be integral components of any government's modernization programmes. The concept of the changing culture is certainly ruthless in that it addresses relationships and expects an attitude change which, if practicable is slow.

Creativity in Libraries

A Managing Director of the Australian company Cochlear Ltd, stated in a lecture that "*Innovation is not just the idea. Innovation can be achieved only when the idea has been transferred into an outcome which has value to the extent that people are prepared to pay for it*" . So innovation and creativity are the two sides of coin.

Creativity vs Innovation

Creativity and innovation are two distinct concepts that rely on one another. Creativity can be nurtured, or squashed, by environmental conditions, procedures, techniques, and interpersonal relationships. Librarians have it within their abilities to engineer workplaces that allow creativity to take root and flourish. Innovation is the outcome of creative processes. Making something that is considered new or novel is the result of a series of creations, some of which fail and some of which succeed, and all of which move the innovations forward. Innovations, also foster creativity. By introducing a new element into the mix, innovation opens up new paths for creation. Both creativity and innovation are intrinsically beneficial for library services. Libraries exist in a marketplace that is more crowded with goods and services than ever before. People have a seemingly endless array of options for fulfilling their information and community needs.

The pace of change is always accelerating. Creative and innovative libraries will be able to adapt to these changes, while libraries that don't innovate their service designs on a routine basis will quickly lose traction. It's true that not everything that's new is by definition good. Creativity and innovation entail risk and risk is good for libraries. Librarians with low risk tolerances will not be able to sustain the environment necessary to

support creativity or innovation. We must accept the inevitable failures that result from trying something new and welcome them as learning experiences.

Role of Librarian

A librarian must be an institution which readily changes to incorporate new ideas and new ways of doing things.

-through our academic programs and our research and development. For this to happen we must all concentrate more effort on understanding and, when necessary, changing the institutional culture.

We can do this by

- *sensing and understanding the environment to prepare ourselves for early adoption*
- *bringing together the intelligence and creativity of our staff so that we can engage in continuous learning and, thus,* ***innovation***
- *applying what we have learned to enable us to take timely and purposive action*

As a librarian our mission is to foster quality learning, teaching and research for the institute we are working for and its communities through *innovative* and effective access to resources and excellence in service. The Library is committed to meeting the needs of users by taking a leadership role in linking the institute to information in a rapidly changing environment. The Library develops *innovative* strategies to select, organize, provide access to, and preserve information resources and the education users about their utlilization. Innovative activities have high priority in the library strategic development plan, but there is nothing in our budget for these activities (for both staff and equipment).The source of motivation for library staff **must be something like the sense of mission or high professional awareness.** For eg. regular staff training sessions on the general topic of information technology and its impact on the librarian and end user can be helpful in this regard. The enormous increase in Internet-based communication serves to shift attention to the virtual, rather than the physical, library. Digital reference services, free access to large-scale data banks and secure retrieval become vital areas of professional development, and there is certainly more to come in this decisive domain of innovation. The librarian's traditional role as 'cultural custodian' or, in the 1980s as 'cultural guide', is downplayed in favour of the librarian's function as effective information disseminator assisting in the user's development of information literacy. The creation of knowledge is no longer the prerogative of formal settings such as schools and work places; and hence the introduction of the term knowledge society is paralleled by a shifting emphasis from education to learning. The competences necessary to advance a knowledge society have to do with creative ways of thinking, acting and cooperating so that existing knowledge is not only preserved and stored, but so that new forms of knowledge are developed and new types of action designed. The development of creative competences is closely related to people's active appropriation of media and ICTs. Today it is possible to digitize all forms of signs (e.g. text, sound, live and still pictures). Thus, the last decade has witnessed a technological and economic convergence of telecommunication, mass media and ICTs. It is becoming less and less feasible to isolate ICTs as separate technologies; and it is becoming evident that the knowledge society.

Role of Information Technology

Today we are living in the age of technology. Use of computers has become a common activity in each and every field of knowledge. Before the invention of 'paper' or the print media the information was preserved on the stone slabs, clay tablets, lather and pieces of wood. Libraries were the store house of the knowledge. Books were kept in the libraries and only the staff working in the library knows about the contents of the books and readers' access to the library was very less. But now the scenario has changed. Over the past few decades, rapid changes in IT have drastically changed the functions and activities of libraries. Exponential growth has made the manual system redundant giving way to computerized information storage and

retrieval tool, which has in turn increased operational efficiency. The application of IT in libraries is quite obvious as it has created a new type of work culture, influenced interpersonal relationship and transformed traditional library services into new information services. It has enhanced the ability of libraries to serve the users to participate for maximum participation in the new world of networking. Improvement of library services is becoming a necessity for meeting the exceeding users' expectation. Importance of digital libraries services due to its multifaceted features and as a provider of access to broader audience of users is much more.

Essential Competencies

LIS professionals should play a role that is efficient and skilled in all the functions related to their work place. The art of the librarianship should be able to make its impact perceptible to the users and finally have to showcase that the art of librarianship is for the betterment not a hindrance for the user activities. They should pay serious attention towards developing and enhancing their core competencies. Competencies that are defined as the interplay of knowledge, understanding skills and attitude required to do a job effectively and efficiently from the point of view of both the performer as well as the observer.

The most important and unique competency of the librarian include in-depth knowledge of print and electronic information resources in the respective areas of specialization of any institute and also the information services to complete the information needs of the user community being served. In the 21st century LIS professionals are experiencing the consequences of three major paradigm shifts. These are:-

- The transfer of paper to paperless media or electronic media which is the is the dominant form of information dissemination, storage and retrieval. The first and foremost shift convergence of different media, such as text, graphics and sound into multimedia resources has a direct impact on this transition.
- Increasing demand for accountability with focus on quality customer services, performance measurement, bench marking and continuous improvement is the other part of this exponential change. But many organisations are facing the paucity of funds and cost cutting due to their financial resources hence providing quality Library and Information support is also one of the shifts.
- Developed or the new form of work organization such as end-user computing, work-teams, downsizing, re-engineering, outsourcing, etc., are some of the other reasons of this shift.

The information needs of users are also influenced largely by the ICT. The users all over the word are connected to masses of information. The users are adopting information patterns to meet new media, ongoing browsing and the ability to find quality information through world wide web.. Therefore, at present two types of information users are there: (1) fully having the knowledge of the latest Information Techniques (II) others are neo-literates or having accustomed to the changing environment.

LIS professionals hence, can enhance the productivity of those engaged in knowledge creation and its dissemination by playing a more practical role rather than the passive one. In this changing dimension, LIS professionals may have to assume the role of analysers, synthesizers and interpreters of information, as in the case of traditional methods in the libraries like acquiring and giving information when it is demanded by any individual or organization. It means they need to be proactive to provide the services to the users' community before hand.

With the transition of such functions as scanning, filtering, acquiring, selecting, organizing and packaging the exposition of information todays' librarians' or information professionals are known as Cybrarians. For surviving with their changing role from "gatekeeper" to 'gateways of information', LIS professionals need to perform their role and should be skilled enough as a trainer in providing information literacy and helping users to fulfill their demands more efficiently .

Library Collection Development

Libraries in India are increasingly facing the enunciation and adoption of new disciplines that is creating a need to develop a mechanism for determining adaptability and acceptability for generating the pattern of collection development. It is a highly challenging task for information professionals because the focus is not only to meet the demand of today but also for the future. It means the professionals of today must have a proper knowledge the Aim, Mission, Vision and the Objectives of their respective organization to fulfill the demands. Professionals should also carry a regular SWOT analysis (strength, weakness, opportunity and threats) of library personnel working in their department. Professionals should also do regular updates of vendors profile and their services. Adopting new techniques like: web browsing, relevant search engines, meta search engines, web resources, databases, directories and other E-information resources would also help in increasing the collection development process in the library.

Collection process and Knowledge Analyses

LIS professionals require information skills for analysing the quality of information and apply the evaluative criteria applicable to both print and electronic resources such as, author's credentials, peer review and reputation of the publisher to judge the authority of the source. LIS professionals should have an expertise to recognize and evaluate documentation for the information source, such as research methodology, bibliography or footnotes, distinguish between primary, secondary as well as tertiary sources (print and non-print) in the requisite discipline/s evaluate their appropriateness to the information need.

Knowledge Retrieval

To access the appropriate from the free flow or the flood of knowledge that is required by the user is the biggest problem in the information age. Here LIS professionals need to play the role of retrieval supporter. Retrieval supporter means assisting or guiding users to retrieve proper information using information technology and guiding them to identify the new and emerging resources that can be assimilated to integrate into the organization to impart competitiveness.

User-education

User education helps to make the users aware about the new information available and to enable them to make use of library resources user-friendly. Library orientation, induction and information skills training etc. comes under user-education skills. LIS professionals should use wide variety of methods to help users in information skills through lectures, practical 'hands-on' sessions, workbooks, printed guides, videos and demonstrations. Now a days the Social Networking sites, Blogs, etc. play an important role in this field.

Collection Service Skills

Library professionals aim to provide the right information to the right user at the right time and at the right cost. LIS professionals have been delivering a wide range of information products and services to meet the needs of their users. It is now must that LIS professionals keep themselves updated in every way.

Upgrading LIS Education and Training

Upgrading themselves (LIS professionals) in the modern techniques could enhance the profession and provide librarians with the means to propel the profession to greater heights and aspiring professional in LIS. Allowing library users to manage their accounts online and providing a forum for users to leave feedback, share recommendations and get information quickly and easily will enhance engagement with the users.

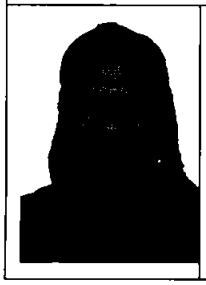
Conclusion:

ICT has brought many new avenues for librarianship to increase their own capabilities to organising and retrieving information in the 21st century. Libraries are responding to a need to reduce costs by changing the shape of their organisational or funding model. This type of change is also driven by an increased appetite ownership, and a merging of the geographical boundaries between individual services and entire local authorities. The information needs of user community and the overall changes that have taken place due to need based adoption of ICT. But in India, it is having a peculiar problem as regards to organization of libraries is concerned. There are more than 60% libraries those are continuing with traditional management and organization of their activities. Consequently, the LIS specialists, academicians, librarians, information managers and intellectuals concerned with the development of libraries should give a serious thought regarding the future course contents of LIS education in the country to enhance the professional skills. Libraries, today, need to anticipate and respond to changes in this age of rapid growth of information, information sources, technological advances and changing user demands. We need to respond quickly and position ourselves to provide useful and relevant services .

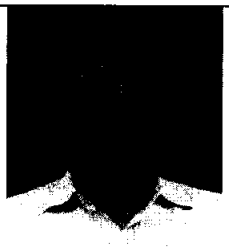
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Curriculum Standardization in LIS Education System in India

Babita Garg



In this paper an attempt has been made to picturise the present status of our Library and Information Science Profession in India and also providing the an insight about the Standardization of curriculum of Library and Information science Education system of India



LIS Education, LIS Curriculum, Curriculum Standardization

1. Introduction

India has witnessed a slow and steady growth of Library and Information Science (LIS) education. The foundation of LIS education in India dates back in1911 when W.A.Borden (1853-1931), an American disciple of Melvil Dewey,for the first time started a short term training programme in library science atBaroda under the patronage of Maharaja Sayajirao III, Gaekwad of Baroda (1862-1939). Four years later in 1915, another American student of Dewey, Asa Don Dickinson (1876-1960), the then librarian of Punjab University, Lahore (now in Pakistan) started a three-months apprentice training programme for working librarians (Satija, 1993 p.37). Before independence, only five universities (Andhra, Banaras, Bombay, Calcutta and Madras) were offering the diploma course in library science. After independence, new colleges, universities, educational institutions andlearned societies were emerging and the need for professionally qualified personnel to manage their libraries was realized. As a result, the number of library science schools started to increase. Library associations which exist at various places started providing training courses.

Dr S.R. Ranganathan started a certificate course at Madras Library Association in 1929 which was taken over by the University of Madras, and in 1937 the course was converted into Postgraduate (PG) Diploma in Library Science. This was the first diploma programme in Library Science in India. University of Delhi was the first university to establish a full-fledged Department of Library Science just before independence in 1946, and started admitting students to the PG Diploma in 1947. In 1951, the diploma was changed to Master in Library Science (M.Lib.Sc). Later, between 1956 to1959, six new LIS departments were established (Mangla, 1998, p.287) at Aligarh Muslim University, M.S.University of Baroda, Nagpur University, Osmania University, Pune University and Vikram University. Since 1960s, the number of LIS departments established has continued to increase.

During this period, several institutions played important role for the development of LIS education. University of Madras started her first PG Diploma in library science. University of Delhi contributed many firsts such as the starting of Master in Library Science in 1951; which in 1972, on account of a major course revision was renamed Master in Library and Information Science (MLIS). The department name was also changed to Department of Library & Information Science. The course on 'Computer Applications in Libraries' was introduced for the first time in the MLIS programme in 1972. The M.Phil programme started in1978. The first Ph.D. was awarded to D B Krishna Rao in 1957, under the guidance of Dr. Ranganathan. At that time it was the only university in the whole of the British Commonwealth conducting Ph.D programme in LIS.

2. The Present Scenario

Library & Information Science has reached the height of a full-fledged discipline in the present era with many universities offering M.Phil. And/or PhD in the subject. Though there are still doubts among LIS professionals themselves so as to determining its acne under the faculty of science or humanities or social science stream. Most Indian universities have placed it with Journalism and Education in a separate faculty consisted of the trio.

Initially, the librarians were much thought of as custodians mould rather than from a service oriented angle. The education also conforming more to that respect but gradually shift came towards use and one eye-opener in this direction is the great 'Five Laws' of library science by S. R. Ranganathan, the father of Indian Library Science. 'Custodian' and 'Curator' concept gradually replaced by the concept of 'Depth Classification' by him and his worthy disciples Ganesh Bhattacharya and Neelameghan. In fact the journey for the Colon Classification was one that led Indian Library Science towards 'Facet Analysis' and 'Analytico-Synthetic' ways of subject building.

3. UGC Efforts Towards Quality Of Lis Education

Concerted efforts for the improvement of the quality of LIS education in Indian universities are evident in the recommendations of various Committees constituted by the University GrantsCommission (UGC) since its inception in 1956. Some notable examples are:

- Ranganathan Committee on Development of University and College Libraries, 1959.
- Ranganathan Committee on Library Science in Indian Universities, 1965.
- Kaula Committee on Curriculum Development in Library and Information Science, 1993.
- Karisiddappa Committee on Curriculum Development in Library and Information Science, 2001.

The recommendations made by these committees at different points of time provide valuable guidelines in respect of standardization of curriculum, enrolment, infrastructure, quality of teachers, teaching and evaluation methodology, research programs, etc. But very little has been done to implement the recommendations. Apart from the above mentioned committees, efforts for developing standard pattern of LIS education are also evident in the recommendations of the UGC Panel of LIS appointed in 1979 and 1982 respectively. It needs to be mentioned here that the model curriculum for different levels of LIS education suggested for the first time by the Curriculum Development Committee (CDC) (University Grants Commission, 1993) raised awkward question 'Is the LIS curriculum intended to match the specific requirement of any particular LIS department of the given university?'Each LIS department has its own objectives and own organizational framework, which is particular to it. Hence, rather than functioning as some kind of master plan for a curriculum, the modular structure of curriculum was suggested in an evaluative study of the first CDC report (Basu & Sarkhel, 1995).Subsequently, the model curriculum of LIS suggested by the second CDC was based on modular approach and the modules incorporated in the model curriculum could be used as a basis for designing an actual curriculum, keeping in view the local conditions and needs (University Grants Commission,2001). But unfortunately this model curriculum was not adopted by most of the universities, as the role of the UGC is more of recommendatory in nature than accrediting.

4. The National Policy On Library And Information System

In the year 1985 the Indian Library Association (ILA) and the Raja Rammohan Roy Library Foundation (RRRLF), both prepared separate drafts of National Policy on Library and Information System. In fact, due to continuing debate on National Policy on Education that finally took shape in 1986, both these efforts were made. The ILA draft devoted one full section on manpower development . It proposed the establishment of a National Centre for Education and Research in Library and Information Science. The RRRLF draft called for uniform pattern and standards for LIS education for the entire nation. It also stated that research and specialised courses may be offered by universities as well as leading research and library promotional organisations such as National Library, DRTC, INSDOC, RRRLF, etc. In October 1985, the Government of India set up a Committee on National Policy on Library and Information System (CONPOLIS) under the Chairmanship of Prof. D.P. Chattopadhyaya. Its report entitled National Policy on Library and Information System—A Presentation was submitted in 1986, and was subsequently assessed by an Empowered Committee chaired again by Prof. Chattopadhyaya to draw up an action plan11. The Empowered Committee in its report submitted in March 1988, recommended that IT should be used as a tool for maintenance of standards in LIS education. Professional development activities be strengthened in a

systematic way. An accreditation agency for LIS courses was suggested to check falling standards due to proliferation of schools. It was also suggested to establish a National Centre for Higher Education and Research in LIS.

5. Students' Selection Criteria

Library and information science is slowly becoming popular, students with better qualifications are joining the course but they are not enthusiastic in opting for library science as their first choice. Therefore, more attention towards selection criteria is needed to attract the best brains. Even to attract middle level talent, incentives like scholarships and fellowships are needed. Merit (as in many universities) should not be the only criteria for admitting the students. Admission test and interview should be adopted to select appropriate students, with pleasant personality, good general knowledge, communication skill, inborn love for books, aptitude towards librarianship and desire to serve others.

6. Apprenticeship Programme

All professional courses need adequate practical training as merelyincentives like scholarships and fellowships are needed. Merit (as in many universities) should not be the only criteria for admitting the students. Admission test and interview should be adopted to select appropriate students, with pleasant personality, good general knowledge, communication skill, inborn love for books, aptitude towards librarianship and desire to serve others.

7. Problems of LIS Education In India

A close examination of the past studies (Mangla, 1998; Singh, 2003) reveals that there are lots of problems that confront the LIS education in India. These problems may be summarized as follows:

- Unplanned proliferations of library schools.
- Lots of variations in syllabi and no norms or standards are maintained in regard to course contents.
- Lack of consensus regarding duration of the LIS courses at various levels.
- Student-teacher ratio.
- Lack of uniformity in
- Teaching aids.
- Inadequate training facilities to update the professional competence of in-service teachers. Existing
- UGC refresher courses failed to provide needed expertise and skills to meet the growing complexities of information environment.
- Lack of internal quality assurance and accreditation mechanism.

Thus, it transpires that no library school in India conforms to the norms or standards and they are facing multifarious challenges. All these warrant continuous review, discussion, experimentation and feedback for standardization of LIS education at this moment.

8. Levels Of LIS Education

The LIS education in India is offered at various levels such as certificate, diploma, degree, Associateship in Information Science (AIS), M.Phil and Ph.D. These programmes are offered on regular basis as well as through correspondence courses or distance education. Details about the types of courses are as follows.

- **Certificate Course:** Certificate courses are mainly conducted by library associations; however, some departments in universities and affiliated colleges are also conducting this course. The duration of the course varies from few months to one academic year. The courses aim to train the students for semi professional or junior level jobs after high school or senior secondary education.

- **Undergraduate Diploma Course:** The Diploma courses are conducted at two levels, that is undergraduate and postgraduate levels. Undergraduate courses are conducted by women polytechnics as a two-year course after higher secondary or intermediate. It prepares students to be junior librarian and hold library assistant positions.

- **Postgraduate (PG) Diploma Course:** PG courses in some selected LIS areas of specialization are offered at the university level as a one-year course after the Bachelor of Library and Information Science programme. At present, only three universities and one deemed university are offering these programmes (Association of Indian Universities, 2003). They are

    - University of Kerala, PG Diploma in Information Technology ;
    - University of Mysore, Post MLIS Diploma in Library Automation;
    - Gandhigram Rural Institute, PG Diploma in Archives & Documentation Management (UGC Model Curriculum, 2001, p.102); and
    - University of Hyderabad, PG Diploma in Library Automation and Networking (Association of Indian Universities, 2003, p.2)

- **Bachelor of Library and Information Science (BLIS):** This is a one-year degree course conducted by universities after students graduate with a basic degree. However, in some colleges, Library Science is offered as an optional subject at the Bachelor of Arts level. For this, the students opt for Library Science as one of the optional paper, along with other optional papers in social sciences or the humanities. Students passing with this option would be considered at par with other degrees (UGC Model Curriculum Report, 2001, p.97). Bachelor's degree prepares students for professional positions in college and university libraries or as a school librarian. At present, 120 Indian universities are offering BLIS.

- **(e) Master of Library and Information Science (MLIS):** It is a post-graduate course offered after BLIS. Presently, a total of 99 universities are offering MLIS, 21of them are offering two-year integrated course (Table 1 & 2) directly after BLIS. Many of the universities, which were initially offering BLIS and MLIS courses have now switched over to a two-year integrated course. The North East Hill University (NEHU) was the first

9. Library and Information Science Education in India

University to start the course in 1986, followed by the University of Madras in 1988. In 1989, Madras also started MLIS through distance education (Patel and Krishan Kumar, 2001, p.211)

- **Associateship in Information Science:** Since 1964, the Indian National Scientific Documentation Centre (INSDOC) New Delhi has been offering a two-year programme in documentation, which in 1977 the programme was renamed as Associateship in Information Science (AIS). On the 30th September 2002, INSDOC merged with the National Institute of Science Communication (NISCOM) and was renamed the National Institute of Science Communication and Information Resources (NISCAIR). The qualification for admission to the NISCAIR's programme is a master's degree in any subject or a BLibSc /BLIS with three years library experience. The Documentation Research and Training Centre (DRTC), established in 1962 in Bangalore, is also awarding AIS. Admission

requirement to DRTC is a bachelor's degree in library science or a master's degree in any subject with a minimum of two years library experience.

- **Advanced Training Course in Information Systems Management and Technology:** This one-year advanced training course in Information Systems Management and Technology is provided by the National Centre for Science Information (NCSI), an autonomous organisation under University Grants Commission (UGC) located at Indian Institute of Science (IISc), Bangalore. (Dutta and Das, 2001, p.25).

- **Other Specialised Programmes:** The Indian Association of Special Libraries and Information Centers (IASLIC) and the National Archives of India also offers specialised courses. IASLIC offers a one-year diploma programme in special librarianship and the National Archives of India offers a one-year diploma programme in archives and related subjects (Patel and Krishan Kumar, 2001, p.212).

- **M.Phil in Library & Information Science:** This is a research programme offered by university departments after one's completion of MLIS. The University of Delhi started this programme in 1978, followed by many other universities such as Andhra, Tirupati, Annamalai, Vikram (Ujjain), and Gulbarga. At present there are 16 universities (Table1 offering this programme. The basic requirement for admission is similar in allthe universities but the duration of the course may vary.

- **Ph.D. Programme:** This is an advanced level research programme being offered after the completion of MLIS or M.Phil degree in library science. Today, 64 universities in India are providing facilities for the Ph.D programme. The general qualification for admission is MLIS. However, LIS teachers and librarians in lecturer's scale areexempted from this requirement.

- **D.Litt. Programme:** Two universities, Banaras Hindu University, Varanasi and Utkal University, Bhubaneswar offers D.Litt. programme in library science. So far only one D.Litt. degree had been awarded in India since 1992 by Utkal University, Bhubaneswar, to Dr D.B.Shukla on the topic 'The work and impact of a pioneer in library and information science: a critical study of the works of Prithvi Nath Kaula'(Kumar

10. Emerging Trends

Departments are carefully viewing their curriculum to put more emphasis on emerging areas like computer and communication technologies, and reducing emphasis on traditional techniques like classification and cataloguing. Departments have started establishing their own computer labs and are emphasizing upon practical training on the use of IT, making the students competent to work effectively and efficiently in the electronic information environment. The trend of offering two-year integrated courses is emerging to eliminate duplication of course contents at BLIS and MLIS levels and providing sufficient time for teaching computer and communication technologies, and relating it to library work through practical training.

The beginning of PG Diploma courses in some specialized areas, like Archival and Documentation Management, Library Automation, Networking and Information Technology, etc. With the introduction of Information Science curricula, there is greater emphasis on teaching LIS related to information organizations that offer specialized services. As a result, Data Banks, Information Analysis Centres, Translation Centres, Patent Libraries have marked the beginning of a new milestone in the global view of information activities.

Like industrial and production management, quality standards are also now being applied to libraries, leading the trend of emergence of ISO certified libraries in India. Therefore, LIS departments are also introducing components of total quality management in curriculum. More LIS departments are getting independent status and privileges like other departments of the university in terms of full-time teachers and full-time head.To face the technological challenges, more existing faculty members are engaging themselves

in computer and IT related courses. New faculty positions are created and filled up with the LIS professionals having computer and IT related qualifications.

More Continuing Education Programmes (CEP) are being organized in the field of computer and related technologies and LIS departments are playing an active role in organizing such courses.

A growing number of LIS departments are developing their own websites to provide information about themselves. With the growing impact of the Internet on LIS, new areas such as digital libraries, electronic publishing, online resources, metadata and information architecture are reckoning as nascent fields of LIS research.

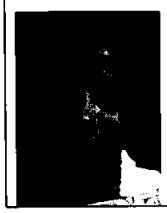
11. Conclusion

Today, the LIS profession has attained the status of a full-fledged discipline in India. However, it has low recognition and has not been regarded at par with other well-known professions. As a result, most students do not opt for librarianship as a first choice of study. National bodies such as ILA, IATLIS and IASLIC should give serious thinking to find the timely solutions for the problems prevailing today. There should be a National Accreditation Body to apply rigorous parameters before granting accreditation to a library

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E-Learning Awareness among Students of Library and Information Science: *A Case Study of University of Rajasthan, Jaipur*

Raj Kumar Bhakar **Archana Saxena** **Rajinder Kaur Gill**



Article related to e-learning awareness among the students of LIS Pursuing B Lib & M Lib Science of University of Rajasthan, Jaipur Rajasthan e-learning was important and major source of learning among new era learners. E- Learning tools delivered through a computer using CD Rom, Internet and Intranet, it may be text form, audio, animation, Photo and Video. The main purpose of this study is to find out the awareness of e-learning among the students of library and information science regarding the Information and Commutation Technology.



E-Learning, awareness, Library and Information Science

1. Introduction

The definition of learning is the act of retaining new information, new skills, or new abilities. We gain the ability to do something through learning though ICT. E-learning refers to use of electronic media and information of communication technology in education. E leaning is broadly inclusive of all forms of education technology in learning and teaching. E-learning is inclusive of and is broadly synonymous with multimedia based training web based training, on line education, virtual education and digital education collaboration. All of these alternative name **emphasigh** a particular aspect delivery method.

E-Learning include various types of media that text, audio, images, animation and training, video and also included technology application and process such as audio or video tape, satellite TV., CD Rom, and computer-based learning as was as local intranet/Extranet and web based learning. E- Learning can occur in or out of the class room. E-learning can be self paced or may be instructor- led. E-learning suited to distance learning and flexible learning, but it can also be used in conjunction with face to face teaching, in which case the term blended learning is commonly used.

Present era is information era and information is available in the format of e-information. So it is compulsory to know about e-learning to learners. E-learning refers to the use of technology in learning and education. There are several aspects to describe the intellectual and technical development of e-learning which can be categorized as under.'

- E-learning as an educational approach or tool that supports traditional subjects.
- E-learning as a technological medium that assists in the communication of knowledge.
- E-learning its self as an educational subject, such courses may be called information and communication technology.
- E-learning administrative tools such as education management and information systems.
- E-learning is a study medium without teacher and physical class room.
- E-learning is beneficial economically because this is a paperless.

2. Aims and objective of the study

- To want to know the use of information and communication technology among LIS students.
- To find about the knowledge related to web resource.

- To know about the constricted/tool use of e-learning tools in studies.
- Want to know the current trends with students of LIS.
- Deals to of the study are the students of library and information science, studying at university of Rajasthan, Jaipur, Rajasthan, India in the session 2013-2014.

3. Research Methodology followed

The present study will be focus on awareness of e-learning among LIS students. For purpose of the study, prepared a structured questionnaire and distributed to all LIS students, B. Lib and M. Lib science of university of Rajasthan. Survey research method was applied for the study and purposive sampling method was used for this survey. 100 questionnaires were distributed of library and Information Science University of Rajasthan of Rajasthan and 90 students responded.

4. Analysis and Interspersion of Data

The manual method was applied for processing of primary data. Total 90 questionnaires were received back from responded. In excel sheet, a table was prepared for each question and then answers from each questionnaire was filled up. Every counted question was written in tabulation for summarizing data.

1. **Do you access to networked computer?**

Figure No. 1

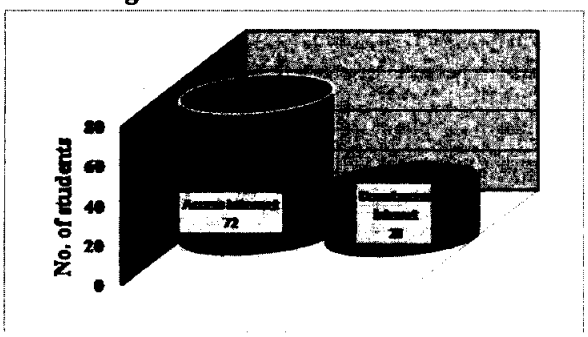
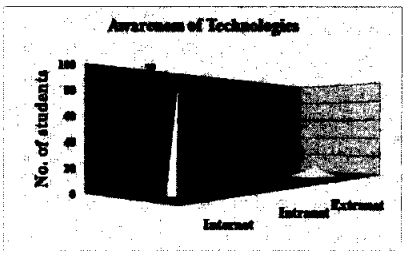


Figure no. 1 that no. shown the result of the networked computers. Out of 90, 72 students are aware of the access of the networked computer. Nowdays Internet is a part of day to day life shown it will give a positive sign those new learners of aware of new technology.

2. **Are you aware following technologies?**

Figure No. 2



Result of figure no. 2 shown that most of students are aware of Internet but half of them are aware of Intranet and few of them are aware of extranet. These show that students generally use of internet and access resources but they are not aware interdepartmental of interconnection.

3. **Are you having knowledge of following Tools / Services?**

Figure No. 3

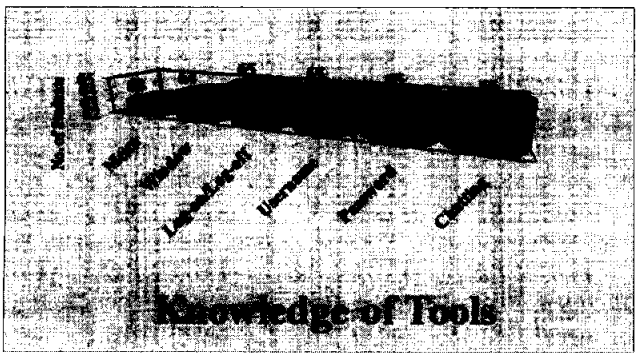
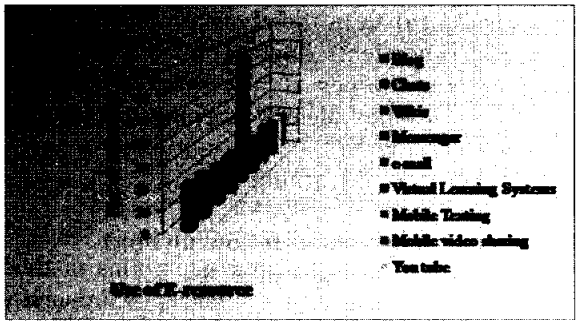


Figure 3 shows that out of 90 respondents 65 students have knowledge of Log-off/log on, User name, password, chatting and 63 and 64 students have aware of menu and window. The study show that this basic technology should be must in the students.

4. Are you use/consultation of e-resource or tools for studies?

Figure No. 4



The result of Figure 4 show that most of students (60 out of 90) are use e-mail as a source of communication and interchanging the knowledge each other and exchange the documents etc, but on other side above graph has shown a negative the awareness of other resources of studies like blog, wikis, chat, messenger etc. It is also shown that e-mail is an important tool for fast communication.

5. Are you awareness regarding the following?

Figure No. 5

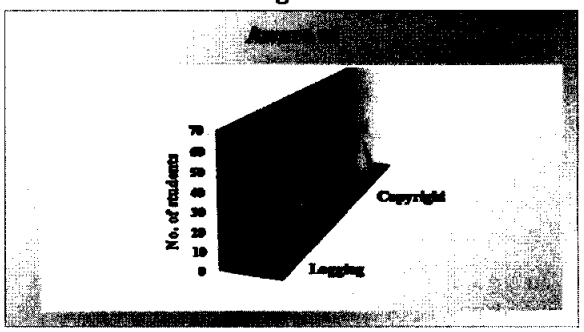
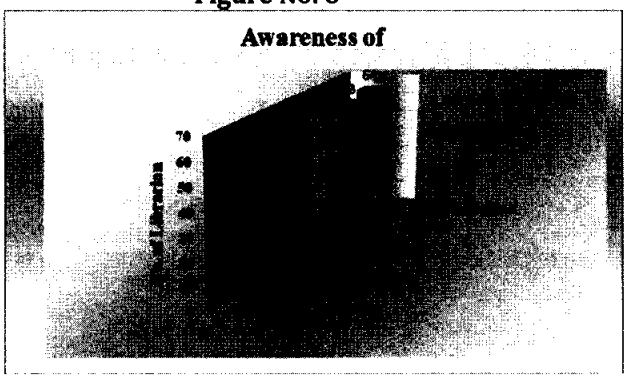


Figure 5 reveals that out of 90 respondents 63/64 students are aware of Logging, downloading/uploading and copy right in there studies. The result show that 19 -19 students have knowledge of Navigation and basic application. Basic application is a urgent need for today information ear, so students should be must aware of this applications.

The data in the above graph shown that most of students using internet but very remarkable number of students are unaware of toolbar and browser, tool, which are very useful in internet surfing. Mostly students are aware of the www word, search engines and TCP IP. The awareness of www show positively results of the respondents.

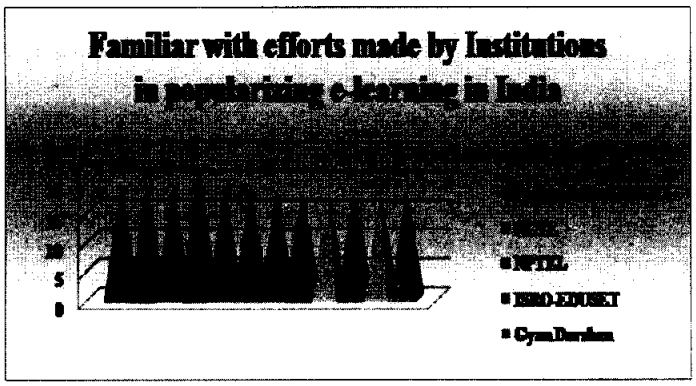
6. Are you awareness of the following?

Figure No. 6



7. Are you familiar with the effort made by the following institutions in popularizing e-learning in India?

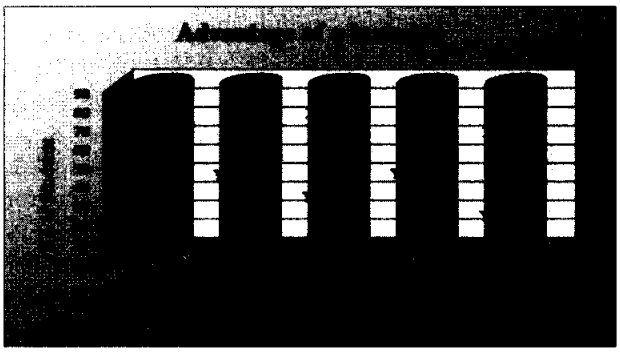
Figure No. 7



Collected data of figure no. 7 show that we know that e-learning resources made by UGC, NCTE, NPTEL, AICTE-INDEST are very popular and important for their enhancement and research work and development of our country, but results of study show that bad impression about the student awareness. So investigator strongly suggested that our LIS school to promote the awareness of above e-learning resources among the students.

8. As per your opinion advantage of e-learning is

Figure No. 8



The analysis of data in the above graph show that out of 90 respondents 88 respondents are agree that e-learning studies is a very cost effective, flexible and facilities lifelong learning. The mostly students fell and agree
with benefits of the E-learning.

9. Are you known about following link?

Figure No. 9

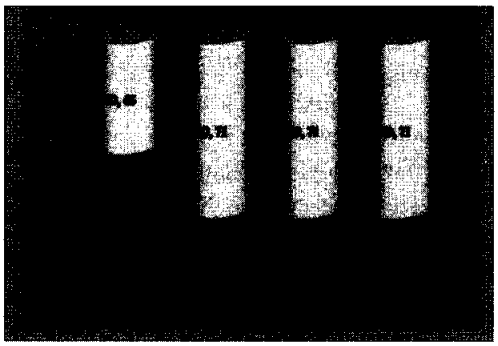


Figure no. 9 show about the knowledge of respondents about DOAJ (Directory of Open Access Journal), Open access search engine NISCAIR full text e-journals. The study shown that a few of respondents are aware of the DOAJ and other link, because these links are very useful for their study.

10. Do you want to give any suggestion about change of syllabus of LIS in University of Rajasthan?

Figure No. 10

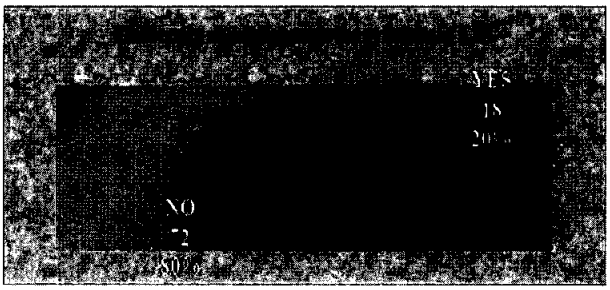


Figure no. 10 shown that mostly respondents are satisfied with their syllabus. They were not wanted to change the syllabus.

Figure No. 11

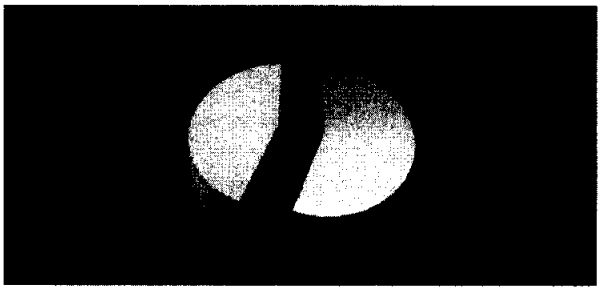


Figure no. 11 shown the percentage of male and female.

Figure No. 12

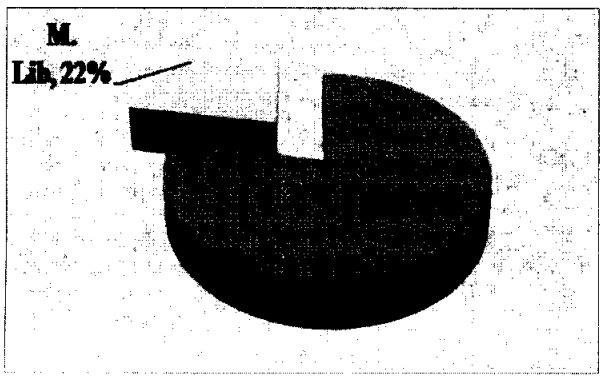


Figure no. 12 shown the students percentage of B.Lib and M.Lib Science

5. Suggestions

Learning is important tools of new students of LIS. Under this study it is found that more orientation of students is needed to exploit the present e-learning resources. And they feel that is a big opportunity to have a class to online resources. Some most of suggestions are listed below :-

- **LIS School Promote the awareness:** investigator strongly suggested that LIS school to promote the awareness of above e-learning resources among the students.
- **E-learning should be compulsory part of the study:** - e-learning should be the part of B. Lib science and M. Lib science level of education of library and information in India, so more students will be aware of online resources.
- **Availability of computer lab:** - E-learning awareness in students in depends in the availability of information and communication technology and on line practice by the teachers/ workshop in charge.
- **Important participation of library professional and teachers:** - library professional and teachers can play a vital role in the increasing of e-learning awareness. Today class rooms and libraries are acquiring e-learning resources to help the users of libraries. This process can be test in order to cover more and more students.
- **New creation of e-learning resources**: - today various e-resource available on internet but they do not complete local needs. Localization information is compulsory. Indigenous e-learning resources should be created and should be available to all members of society without ant discrimination.

Above results shows that e-learning our need.

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E-Learning and its Impact on Digital Library and LIS: *A Bird's Eye View*

Swapna Athavale



The paper gives a bird's eye view of e-learning and its impact on digital library and its services, about how e-learning metadata can be enriched through digital libraries , ways of improving information access in e-learning by integrating digital library and ontology , significance of e-learning on library science education. The plethora of digital resources augmenting the e-learning process and the role of librarian which have undergone changes with the advent of information technology to impart effective e-learning programs. The crucial new technological breakthroughs like web 2.0, e-learning standards like LOM, content management are taken into consideration.



E-Learning, Web2.0, E-Learning tool, Digital Library

1. Introduction

E-Learning "is a means of becoming literate involving new mechanisms for communication: computer networks, multimedia, content portals, search engines, electronic libraries, distance learning, and Web-enabled classrooms. E-Learning is characterized by speed, technological transformation and mediated human interactions". Terms that are commonly used to denote e-learning are 'online learning, 'tele learning, 'virtual learning, 'computer-assisted learning', 'web-based learning' and 'distance learning'. **Stokes (2000)**

Today most of the e-learning activities are delivered using Internet. Some of the present applications of e-learning are on-line training, distance learning with threaded discussions or interactive bulletin boards, website-based curriculum, courses that post assignments online, correspondence course style, read and test programs etc.

2. E-learning tools

A plethora of ICT or virtual communication tools are now available that are employed in e-learning process.[3] Most prominent among them are: e-mail, Mailing lists or Listservs Newsgroup or usenets , Bulletin boards , Instant messaging , Polling , Web-forms , Chat or conferencing , Internet telephony , Videoconferencing , Blogs , Learning portal or web-based training portal. A library professional is using most of the above mentioned tools in organizing modern library services like alerting the readers about new relevant references by e-mail, integrating information from various sources and disseminating it to the concerned users or group of users by mass messaging, setting up bulletin boards and blogs devoted to special professional topic or theme and conducting web based surveys to assess the quality of services and usefulness of library material.

3. E-learning and Role of Digital Libraries

E-learners and traditional learners now have access to universe of digital information. Challenges and opportunities which digital libraries bring to the support of e-learners and new ICT technologies and educational models , requires librarians to re-evaluate the way they develop, evaluate and disseminate resources and services. E-learning is much more than just providing different forms of material to the e-learners. With the plethora of heterogeneous resources it becomes important that digital libraries should maintain learning object repositories along with learning object metadata which helps the e-learner to evaluate and understand the resources according to his/her personalized needs.

The digital library serves as a facilitator in organizing and providing knowledge and resources to its users. A focus on collaboration between library and faculty improves course design support teaching and learning objectives, particularly when it involves students' contribution and feedback. All the parties should have the common vision in which each one participates actively by contributing their skills and perspectives to the building of genuine partnership. Considering library as an active partner of the learning community, helping learners to become 'information literate'.

As we all know that librarians in a traditional library setting have been providing metadata in the form of catalogues to locate library resources which becomes all the more important for electronic resources. With e-learning and digital library services, and to solve the problem of information overload maintenance of learning object repositories will serve the user need and preferences. Learning object repositories (LOR) become a crucial element of any lifelong learning scenario as they give support to the learning process. Therefore digital libraries, as providers of heterogeneous educational resources, are also essential. Actually, digital libraries are also a target for personalization purposes, especially when they are integrated in a virtual learning environment (Ferran et al., 2005).

Learning online needs appropriate metadata for describing the content in order to retrieve and select it and online learning needs metadata for describing not only the content in itself but also competence and user preference. Learning objects can be considered 'any entity digital or non-digital which can be used' re-used or referenced during technology supported learning". LOM (2000). If digital library is focused as a collection of educational material it may be useful to think of it as repository of learning objects. Librarians describe the resources of catalogues and other collections through metadata in order to facilitate efficiently the delivery of information. The resource descriptions enable users to discover and identify existing materials and to evaluate and distinguish between different sources and allow the option to personalize information presented via learners' information profile. (Foster-Jones and Beazleigh, 2002).

Metadata provides controlled and structured descriptions of resources through searchable access points such as title' author, date, location' description' subject' but can also provide interpretative information about the relations between the resources. (Friesen,2002). But all the needed information cannot be stored into the learning objects in the form of metadata, as they would become too specific, thus reducing reusability, which is the main goal of learning object repository. For supporting use of external structures need for ontologies will serve the purpose which describe the relationship between all the elements in the learning scenario.Ontologies can be used to better describe such elements incorporating a semantic level of information which can be used to enrich the learning process(Sicilia and Garcia-Barriocanal,2005)

Learning object repositories will become a basic piece of any learning environment, providing users with high quality contents, properly described and supported by means of metadata' taxonomies and ontologies. The integration of such repositories into the learning process is a key issue for ensuring proper use, not just being a mere space where to find educational resources·

Web 2.0 is a vision of the Web in which information is broken up into "micro content" units that can be distributed over dozens of domain. The Web of documents gradually and smoothly changes into Web of data. The e-learners are not just looking to the same old sources for information. Now they are looking to a new set of tools to aggregate and remix micro content in new and useful ways. [10] [11]Libraries worldwide are trying to maximize online access to enhance transparency of library operations and increase interactivity thereby adding new value to the users with increased library usage some of these are: Based on web 2.0 technologies, libraries are setting up blogs for online library reference services. Libraries today rely more on informal and instantaneous communication via instant messaging and wikis. Libraries are offering more space within their walls that congregate the digital natives online. Promoting library collections and services through Face book, RSS Feeds and widgets.

4. E-learning and LIS:

With the technological advancements in the field of library & Information science and emergence of ICT, terms like metadata, thesaurus construction, digital library software, web2.0, institutional repositories etc. in LIS, and to learn and understand these terms the need of the hour is to impart education and training to the students on these LIS topics with the help of e-learning tools.

Predictions regarding future usage of E-learning in LIS education LIS schools must model use of emerging technologies to deliver instruction and provide hands on opportunities for students to function effectively in digital environment. The significant factors which encourages the LIS academics to embrace e-learning tools and technologies and support LIS education process. It also deals with management part of Knowledge resources and the problems faced in managing these resources.

Suggestions for LIS schools to solve problems of Knowledge representation (KR) were like building consortia among LIS schools. LIS schools must have better trained and skilled librarian for electronic resource management. Database management and use of CD-ROM and DVD: LIS schools should maintain a database which contains all lectures and individual instructions wherein users log in using their user name and password and frequent updating of the web pages and some significant KR can be preserved in the form of CD and DVD.

The traditional teaching methods' should be adopted to provide the basic knowledge and to develop skills in carrying out library housekeeping operations, and e-learning should be adopted for the continuing education in LIS. According to Kishan Kumar and Jaideep Sharma the use of blending method in LIS education will help to retain students in LIS courses. As a result LIS e-learner will be in a better position to manage electronic information sources effectively and electronic library, therefore more capable to provide effective services to his e-learning users.

5. Role of librarian in e-learning

Application of ICT in to the libraries requires on the part of librarian, improvement of different kinds of skills and knowledge and with better personal, professional and technological competencies, it will help them to have bright future in modern libraries. The librarian as a member of digital library design team is perhaps as one of the roles identified. However apart of digitization and text encoding projects, the current development of digital library-like systems is taking place outside the library environment where inclusion of digital librarian in the design team is not given and colleagues from other disciplines must be convinced of the librarians' potential contribution. For example the team developing the higher level skill for the industry (HLSI) repository of e-learning materials did not initially include librarians but growing problems with retrieval led to recognition that librarians had a key role to play primarily, in the areas of metadata creation and controlled vocabularies (Ryan and Walmsley, 2003). In context of e-learning and e-scholarship, librarian must have grip over wider understanding of the context in which they are working to communicate effectively.

Librarians should select, locate and describe quality internet resources and help to provide access to journal databases and e-book collections providing link to full text from wide range of online resources and publications including scholarly journals. To develop this framework library works with faculty, researchers, scholarly societies and publishers in developing and managing collection of these enriched online resources. Librarians should develop on-line tutorials for using various electronic resources and services in the e-learning environment, so that it can reach the remote users which could be provided from the library's website. Librarians should be aware of the emerging standards and frameworks like IMS, Learning object metadata (LOM) etc. They must develop ability to work as part of e-learning teams, to develop and organize content for e-learning programmes and to support and understand unique needs online learners.

6. Challenges of E-learning

Some challenges of e-learning systems which need to be tackled are content organization, Knowledge representation and access management. As document collection in e-learning systems is mixed media material as well content is being added, deleted, modified or removed by teachers and sometimes learners also contribute if collaborative activities by students are encouraged. Thus collection side should be flexible in content representations, friendly in content management and intuitive in user interface.

Missing contact of face-to-face interaction between student and teacher is another knowledge representation challenge through which students get the benefit of straightforward and intuitive knowledge of teachers which needs to be retained in an e-learning environment. As students have an advantage of accessing interacting with learning material directly without the need of teacher, it also poses access management challenges which requires e-learning systems to have multiple access and interaction methods to accommodate students various needs and preferences.

However e-learning supported by digital library has eliminated the constraints of space and time for imparting modern education and training, particularly at higher levels. On the higher end of the spectrum, the development of the concept of web intelligence, which incorporates practical utilities of artificial intelligence and advanced information technology in the next generation of web related products like intelligent web services, semantic markup, and web mining are expected to boost the e-learning in significant way as discussed below. For example a proposed expert system called **educational servers** would have enough capability to arrange for personalization of learning tasks **to act as an intelligent** tutor with both domain and pedagogical knowledge. It would keep track of the learning progress of individual student and deliver the course accordingly. The advanced technique of web mining, which collects globally distributed content and knowledge from the web, refreshes and structures it continuously, and tracks its usage, would greatly assist this process.

7. Conclusion

E-learning environment though seems not as cost effective at the beginning but gradually and in the long run will only need maintenance of services. E-learning is changing the face of library and the librarian in terms of resources and services provided by the library and the role of librarian as a facilitator, who has been continuously helping the learner by providing him course specific material in different forms from all over the world. And the e-learners are in turn benefitting through well-designed e-learning programs. Learning object repositories will provide users with high quality contents, properly described and supported by means of metadata, taxonomies and ontologies. But along with this there are certain issues and challenges which need to be dealt with e-learning systems in terms of content organization, Knowledge representation and access management issues and above all to provide personalized services according to user need and preferences and tracking user understanding in the e-learning process. To achieve this, the faculty, the library, the IT, and the instructional design departments need to collaborate in developing infrastructure. And at last but not the least E-learning success is determined by the satisfaction in the learning process achieved by each student, and this satisfaction is directly related to the degree of interaction with learning resources, with the teacher and the other students in the virtual classroom, and the flexibility of the learning process in itself.

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E-mail Discussion Forum in Library and Information Science in India

Umesh Dhanraj



This paper analyzed the importance and use of E-mail discussion forum. Its benefits in the field of importing knowledge in the present scenario. E-mail discussion forum give us comprehensive information by sharing the problem forum proves that "Sharing information improve one's knowledge."



E-mail discussion forum, LIS forum, E-mail.

1. Introduction

Library is the 'soul' of an educational institute. It can be never be separated. Today, there is a great scope for the enhancement of the libraries. Science has proved as a boon for this field. By the application of new techniques, we can facilitate our work and make it more interesting. In this world of globalization. Speedy network and fast accession of knowledge and information is necessary or rather it has become an inevitable element for the development of the students in particular and the world in general.

Hence, Electronic mail, Discussion forum, List servers, Mail servers, LIS forum, Discussion boards all this serve and cater the needs of the libraries and the students. They play a significant role in the spread of knowledge throughout the world.

This study, has been initiated on the premise that the hybrid nature of electronic mail – having elements of interpersonal and mass communication – calls for more research based on organizational and mass communication theory, such as media richness, social influence, mass media models, and the diffusion of innovation theory.

2. Review of Literature

Previous research efforts have shown that many people engaged in planning related activities have reported that list-serve E-mails led to the development of the E-mail Inverse Importance Index grounded theory, which holds "The more important a sender perceives an item of information to be, the more people he or she will send it to in a mass distribution electronic mail. Inversely, the more people who receive the mass distributed E-mail, the less important the receiver will perceive the information to be to himself or herself directly.

As foreshadowed by early studies of the impact of technology in organizational communication, E-mail quickly became a frolic method for communicating with co-workers. Its popularity was not without obstacles, however. Hunter and Allen (1992) found media richness was a key factor in employ's ability to successfully adapt to the use of electronic mail in the office. Phillips and Eisenberg (1993) recommended that electronic mail be used with strategic purposes in mind to maximize its effectiveness.

As the newness of electronic mail wore off, researchers began to question the universal efficacy of technology. For example, D'Ambra et al., (1998) acknowledged that computer-mediated communication was the basis of electronic communication in organizations, but they found evidence to challenge the media richness of E-mail because of the multi-dimensionality of the technology. In short, E-mail messages were not always equitable in their ability to reduce ambiguity for recipients. E-mail overload was recognized as early as 1997 by Berghel, who even coined the term communication slavery in response to employees' perceptions about the role e-mail had come to occupy. At the top of the list of concerns was interpersonal abuse and indiscriminate mass mailings (Berghel, 1997).

Even as the promise of E-mail was beginning to come over scrutiny, employees continued their ambivalent relationship with electronic communication. E-mail, with distinct advantages and disadvantages compared to face-to-face communication, was viewed to be both a tool and a torment (Goldhaber, 2001). On one hand, 80 percent of employees favored the use of E-mail for business related communication, compared to phone conversations, because of the convenience E-mail provided for use with more than one person and ease of keeping a copy. However, the interpersonal dynamics of E-mail were so different than face-to-face dialogue that Barnett (2003) found E-mail was not a substitute for a meeting. Notwithstanding that E-mail's ability to transmit information rapidly across space and time, Barrett found that the limited number of opportunities for input circumscribed E-mail's effectiveness to facilitate meetings.

Forums are the discussions groups from different fields of professions, people from different subjects, associations, organizations. To know latest developments in their profession, get help from each other, to know employment opportunities, to know forth coming conferences, seminars, and to seek advice from elderly professionals. LIS Forums and Groups main intention is to discuss, exchange ideas as well as to fight for common cause for the betterment of profession. Library Science profession itself is profession which fulfills others information needs.

LIS forum is one of the early internet tools for discussing among the core interested groups. E-mail discussion forums are one of the early applications of e-mail developed on networks like Bitnet, which have become very popular on Internet now. Using e-mail as the medium, forums enable informal communication among a group of people in a specific area, irrespective of their geographical location. Computer software used to set up and operate a forum on a network computer is called as the list server. The email facilities are currently free service provided by many search engines groups. Number of emails can be created from different groups of service providers. There are several groups such as Yahoo, Google, etc.

3. Forums, Forum Addresses and Forum Software

Discussion forums, also known as "Lists", "Computer conferences", "Mailing lists", "Discussion groups", "List servers" or "Mail servers", are those in which a person (scholar, professional, etc.) can carry out discussion with a group of people having similar interests. The discussion is carried out either by putting question to such forums or by letting others to know about latest things happenings in that particular area. Discussions are carried out using e-mail. The terms "Discussion forum", "Forum", "Mailing list" and "List" are used interchangeably.

The operation of discussion forums is automated and controlled using a computer program, called the list server. It resides on a network computer, which can be used to set up and maintain one or more lists covering different topics. It maintains names and e-mail addresses of all people who are currently subscribed to different forums. This address list is automatically updated whenever new subscription requests are received. When a person mails one message (called a "posting") to the list server, it then "explodes" the addresses and sends copies to each member of that list.

4. Communication in Library and Information Science (LIS)

Many difficulties face LIS related services providing professionals as they attempt to measure and report the value of their units' operations to the higher authorities. Determining the value of a unit's operations is traditionally approached quantitatively through the use of techniques such as cost-benefit analysis and return on investment calculations. However, the intangible nature of LIS makes a quantitative evaluation challenging because of the absence of isolated, identifiable products or outcomes. Furthermore, it is often difficult, if not impossible, to disaggregate the causes of specific benefits or cost savings. However, it has been reasonably accepted that the seamless communication can help the LIS professionals in providing best services to the library users.

5. Importance of the Study

Web-based Discussion Forums, Email discussion groups are no wonder undoubtedly the best ways of resolving any of the problems we have under the Sun. Not just that, we get wide exposure to the area that we are researching and delving into. At the same time, the topic that we are researching and resolving the problem in the discussion forum, also becomes like a knowledgebase, which search engines help future readers to make use of the same.

Discussion boards can be used in many ways, but some principle advantages exist however you use them. The main benefit of asynchronous (not real time) communication is that anyone can join and read forums at any time convenient to them, catching up with messages already posted. People can reply at once, or go away and think about their answer before coming back to reply; or indeed, as in a real discussion, they can simply listen without contributing at all. Discussion boards are generally archived, so one can print a particularly interesting or relevant discussion, equally they can return to it at a later point when further contributions may have been made.

Discussion boards can be seen as impersonal, with no face-to-face interaction, however the level playing field they create allows the participants (LIS professionals in this case) to contribute as equally as more dominant personalities in the field. Should it prove necessary, individual users can be temporarily 'blocked' from posting to allow others to have their say. Additional features, such as enabling 'anonymous' posting, ensure that 'stupid' questions can be asked with impunity.

6. Conclusion

Working in the field library science, it is essential that, holding communication with our collogue In the same area. In the field of library and information science, librarian play a vital role in the field of library an information science so that creative awareness among the LIS professions olds staff & student community spread. E-mail discussion forum is a very useful relevant information. Every information is not knowledge but if LIS, professional gone through the proper methodology or one's problem and follows the steps then if is becomes knowledge. E-mail discussion group one undoubtedly the best ways to resolving a problem. This study provides a snapshot on the use of social networking in academic libraries through a review of available literature and an examination of libraries preserver on the most popular social networking sites. User can search for information and retrieve old massage form the achieve. One has to be professional with the intellectual capability to anticipate adopt to them, Find pragmatic solution to the challenge that come up with every change and infects develop the capability to become the change agent.

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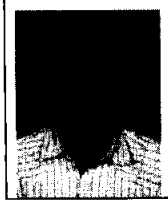
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Implementation of E-learning using Moodle Open Source Software: *A Case Study of Jaipuria Institute of Management, Jaipur*

Raj Kishor Kampa



The purpose of the paper is to design and development of e-learning at Jaipuria Institute of management using Moodle open source software. The study covers the structure, content, and usages of e-learning system at Jaipuria Institute of Management, Jaipur. This paper examines the possibilities of applying open source software (OSS) in the teaching and learning process of the institute. The institute has successfully implemented e-learning using Moodle open source software. Through this e-learning platform, the institute provides 24*7 access to course contents to the students and conducts online quiz and survey.



Online learning, E-learning, Virtual learning environment, technology-based learning, Open Source Software, Moodle.

1. Introduction

Many research studies reveal that the traditional pedagogy through books and figures seems not enough. The advent of information and communication technology (ICT) has supplemented the traditional face-to-face teaching and learning process with various virtual or electronic learning (e-learning) systems and opened up a new avenue for open learning which is more social and participatory in nature. In today's education, e-learning is the fastest moving trends to help prepare the students for in-depth in interactive instructional environments, thereby enhancing their learning opportunities in both online and traditional pedagogy. Due to immense pedagogical benefits of e-learning, which is peer based self-directed, is used as a tool for supporting a style of learning by various institutions around the world. They uses various proprietary as well as open source teaching and learning applications such as Blackboard, WebCT, Moodle, Sakai, ATutor etc. to provide 'anytime' 'anywhere' earning experience. The proprietary e-learning softwares are very expensive to buy their license, so it is not economically feasible for the institutes of Third World countries to buy these software. To leapfrog these technological advancement open source software (OSS) offers the best solution. There are many e-learning OSS available which are designed to address all facilities of proprietary software. Consequently, it solves many problems. The most robust e-learning OSS is Moodle, which is widely known as learning management systems (LMSs). It is the most used e-learning OSS by the most of universities and educational institutes around the world to develop a professional and more interactive environment. In India most of premier educational institutions like Indian Institute of Management, Indian Institute of Technology, central universities have started using Moodle since it is inexpensive tool for creating professional educational environment. Jaipuria Institute of Management Jaipur has successfully implemented Moodle to supplement face-to-face traditional course.

2. Aim and Objectives of the Study

- To provide collection of learning methods using information communication technology the students
- To provide interactive instructional environment to the students
- To enhance the learning opportunities of students in both traditional and online pedagogy
- To develop virtual learning environment using open source software
- To provide 24*7 'anytime' and 'anywhere' access to course contents to the students.

3. Methodology

This paper examines the possibilities of applying open source software (OSS) in the teaching and learning process of Jaipuria Institute of Management, Jaipur. Moodle, Modular Object-Oriented Dynamic Learning, was downloaded from www.moodle.org and installed. It was customized and theme of the home page personalized. The course contents of PGDM 2012-14 and PGDM 2013-15 were created. Several orientation programme were conducted for the students to provide hands-on training on how to use the e-learning platform (participate in quiz, submit assignment, collaboration). Training programme were also conducted for faculties to help learn how to create, upload and manage their courses.

4. Jaipuria Institute of Management, Jaipur: an overview

Jaipuria Institute of Management, Jaipur was established in 2006 under the aegis Jaipurias family. It educates graduates in management; and offers a well crafted 2 year full time AICTE approved Post Graduate Diploma in Management. The institute follows a trimester system of study and the entire 2 years programme divided into six trimesters. It follows continuous evaluation system to measure the learning outcomes of students. That is why each courses are assessed the learning of students by conducting quizzes, assignments, case/exercise analysis, discussion /report submission, project / term paper, mid-term examination and end-term examination.

5. Moodle Overview

Moodle, Modular Object-Oriented Dynamic Learning Environment, is one the most famous learning management systems (LMSs) around the world. It was developed by Martin Dougiamas. In the academic arena, Moodle is the most sought media tool that is widely used across most universities to develop interactive educational environment. It is user-friendly and easy to customize open source for e-learning. Though, it was originally developed for Linux OS, now it is compatible with various Windows and Macs OSs. Moodle supports myriads of features. They are:

- Quiz
- Assignment submission
- Survey
- Wikis
- Chats
- Lesson
- Glossary
- Forums
- Online calendar

Besides this, Moodle provides the following benefits

- 24*7 'anywhere' anytime access
- Upload and download course material in any format
- Link to other resources available online/locally (linking to youtube video, flicker etc.)
- Create rich content HTML per se

6. E-learning Management System @ Jaipuria Jaipur

Course/e-learning management system is developed in the institute is developed using Moodle to help the course instructors to create quality online course, thereby manage the outcomes of the students. With the help of computers/laptops/Ipad/smart phone, the students participate in a course (Kampa, 2012).

- **Create Categories and Courses:** Jaipuria e-learning system powered by Moodle open source software can be accessed by providing user ID and password. After supplying the log in password, the users will be landed in *home page* of the website.

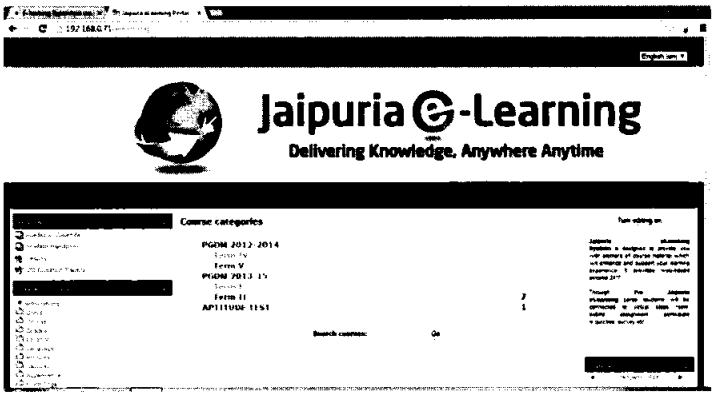


Figure 1 - Home page

Once log in to the e-learning system, the course creator/teacher/administrator can create course category and course by *turning edition on* option. Moodle has various options for course formats like LAMS (Learning Activity Management System), SCORN (Sharable Content Object Reference Model), social format, topic format and weekly format. Since the institute has only 2 year PGDM course, 2 course categories i.e. PGDM 2012-2014 and PGDM 2013-2015 have been created. Each course category has sub-categories according to their Trimesters (Figure 1 & 2).

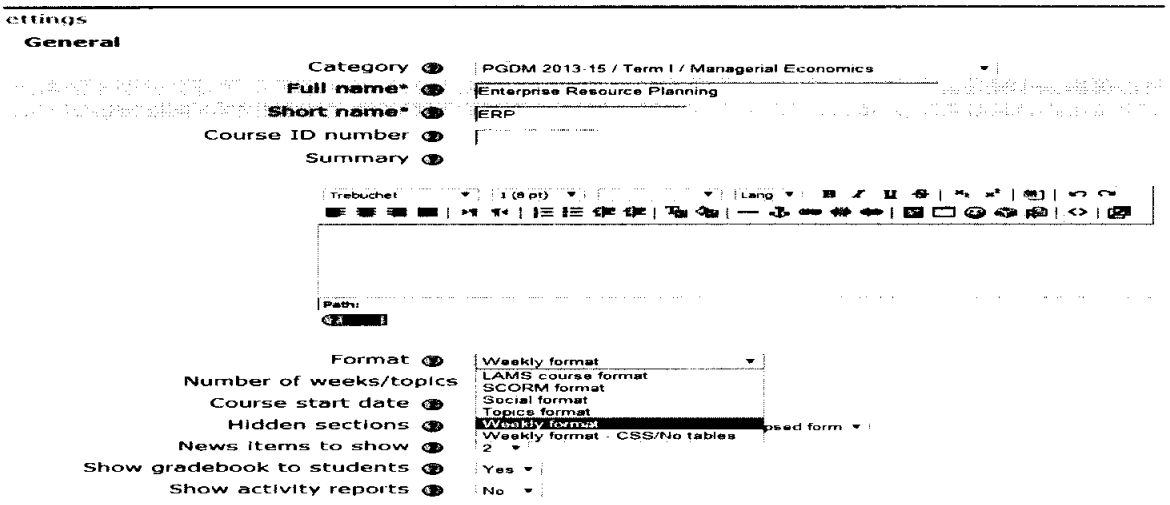


Figure 2 Creating Category and Courses

- **Adding Teachers and Students:** Teachers and students can be added to Moodle by using administrative block. All the students of PGDM 2012-2014 and PGDM 2013-15 batches were added and they were given unique log in Id and password to access the e-learning portal. Likewise teachers were added and assigned as teachers of their respective courses. Orientation classes were conducted to make them aware about working of the e-learning portal.

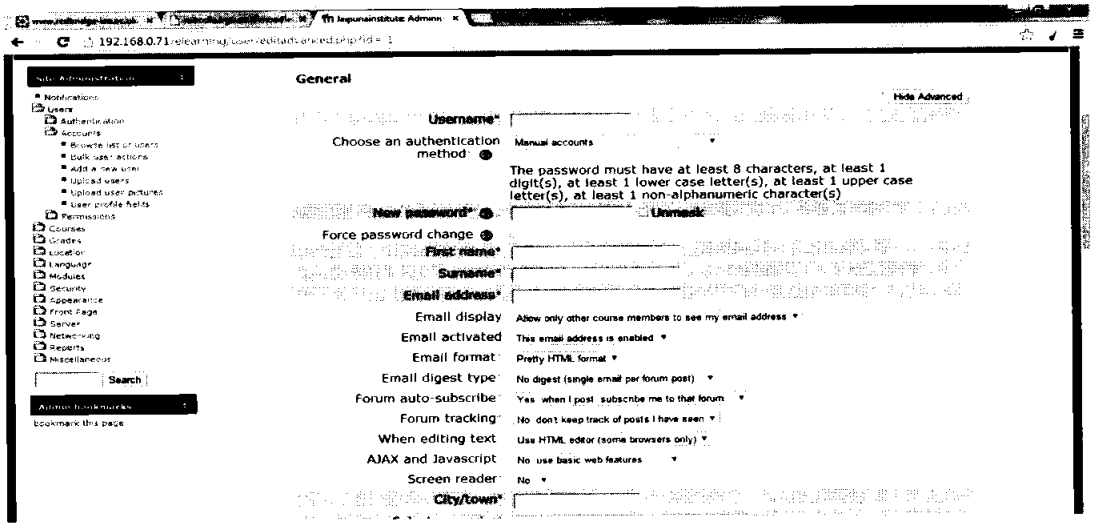


Figure 3 Adding Teachers and Students

- **Adding Course Materials:** Static course materials can be added that the student reads, but student does not interact with. All the course materials: course outline, old question papers, PowerPoint presentation, and related reading materials have been uploaded in the e-learning portal to facilitate 24*7 access to the students.

- **Adding Quiz :** Quiz building is quite easy and flexible in Moodle. Rich text HTML editor is available in each quiz question; it helps to add image file, text file, movie file etc (Figure 4). Quiz is the major activities to assess the understanding of the students. The institute used to conduct quiz on paper. With implementation of Moodle, the institute is now conducting quiz online, which is more convenient and easy. Consequently, the institute saves a lot of papers and toners.

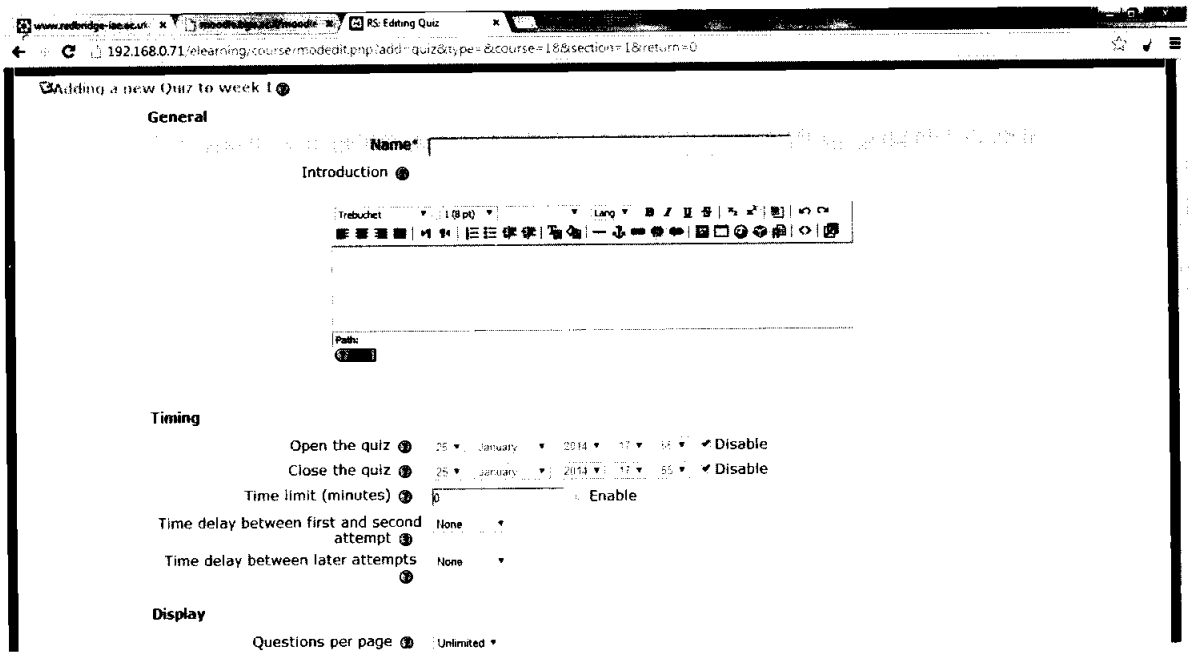


Figure 4. Adding quiz

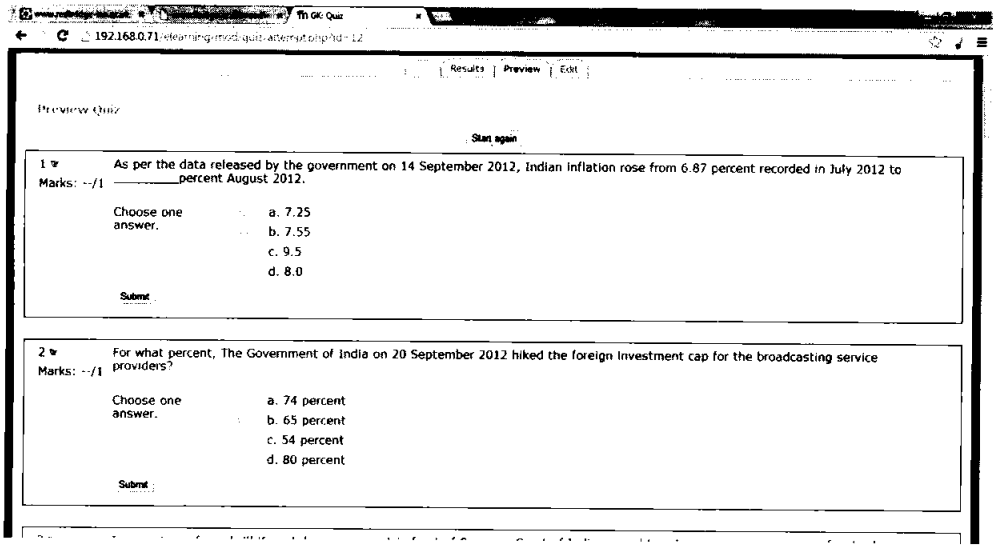


Figure 5. Quiz Questions

7. Conclusion

Since e-learning offers immense pedagogical benefits, it is used as a tool for supporting a style of learning by various institutions around the world. In India many institutes/universities of repute have started implementing e-learning to supplement the traditional pedagogy. Further, e-learning helps students engage in social interaction and collaboration. Consequently, it improves learning skills of the students. The license fee of proprietary e-learning software is very high, so the Moodle open source software offers the best solution to implement virtual learning environment. Through adoption of Moodle, the students, teachers and other agencies will be benefiting a lot to experience collaborative learning.

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Library and Information Science (LIS) Education especially in Hindi Speaking regions of India: Some Contemporary Issues

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The digital revolution has brought series of transformation that direct effected library and information science education. Application of technology has opened up new vistas and thus, all LIS schools should think seriously in terms of the changing context. Students need to be given adequate knowledge of computers (including hardware), computer and communication technologies, networks and networking, operating systems, Internet concepts, database management systems, with adequate practical exposure to handle these technological devices. The research paper throws light on burnt issues as LIS education satisfied the global needs, curricular/courses activities relevant to our regional and national needs, faculty position and qualification of faculties, internship programmes, physical facilities, infrastructural facilities, departmental buildings, financial resources and satisfactory level of LIS education. These issues are discussed in this paper refers as contemporary issues and suggests possible solutions and recommendations.



LIS, Hindi Speaking Regions, Contemporary Issues and Information Technology

1. Introduction

Library and Information Science is an interdisciplinary field that applies the practices, perspectives, and tools of management, information technology, education, and other areas to libraries as the collection, organization, preservation, and dissemination of information resources. Library and information science is a discipline concerned with study of the principles and skills required for systematic collection, organization and use of society's information resources in libraries. It is also concerned with the forces governing the flow of information resources and creating ready access to these resources. It is in the realization of the significant role played by information in the development of a nation, that library and information schools were set up. They are expected to train and produce the needed manpower for the nation's information work. At present, there is a great demand for the services of information workers (librarians, archivists, documentalists, corporate information analysts) in the job market (Ozioko and Nwabueze, 2010). Library science (often termed library studies, librarianship or library and information science) is an interdisciplinary or multidisciplinary devoted to applying theory and technology to the creation, selection, organisation, management, preservation, dissemination, and utilisation of collections of information in all formats (Reitz, 2004).

LIS education is as entailing librarianship, information management, records management, archive practice, and teacher librarianship. However, there is no generally agreed-upon distinction between the terms library science, librarianship, and library and information science, and to a certain extent they are interchangeable. The technology has allowed ever new ways of creating, storing, organizing, providing information and the user expectation enhanced the role of LIS professionals has increased. Therefore, the manpower that come out in market should well verse in ICT based LIS education. Present society demanded engine guru, effective net worker, service coordinator, information evaluator and marketer, keen innovator, prompt learner, information counselor, team worker and many more. So, LIS schools should prepare manpower for such roles, and they should have desired competencies and skills. LIS education should be revamping their facilities, reviewing their educational programs, well trained faculty, and building a curriculum with a difference that may match the needs of knowledge society. Therefore, it was necessary to investigate that LIS education in Hindi Speaking Regions prepares students with global competencies and skills and curricular activities relevant to our regional and national needs. If not so than find out the reasons and suggested the solutions.

2. Objective of the Study

The main aims of LIS education are to provide trained manpower. Application of information and communication technologies has revolutionized the whole concept of libraries. Now the objectives of LIS education also changed. The manpower should train to be more practical oriented and should be equipped with intensive and extensive knowledge on the use of IT in libraries. Therefore, the objective of present study was to investigate LIS schools of Hindi Speaking Regions are producing its outcomes in term of changing context.

3. Scope of the Study

The scope of the present study was confined to show the contemporary issues of LIS education especially in Hindi Speaking Regions of India.

4. Methodology

Maximum data was collected by survey method. Primary data through questionnaire and secondary data by books, journals, and websites etc. collected data was shown in tabular form.

5. Review of Literature

Vishwamohan, V and_Yadagiri Reddy, J (1986) Accreditation of LISc Education in India : Standards and the process. Moran, Barbarab (1991) Evaluation of faculty in schools of Library and Information Science : An element in educational excellence. Vashishth, CP (1992) Advancement of librarianship in India. Chakrabarty, Bipul Kumar (1993) Information manpower : strategic issues for development. Basu, Ashok and Sarkhel, JK (1995) UGC – CDC recommendations on curriculum development in Library and Information Science, 1993 : A review. Isaac, KA (1996) Future prospects for education for librarianship in India. Munjoo Munshi Usha (1996) Library and Information Science Education scenario : Past, Present and future with special reference to reinvesting the curriculum of 21st century Varalakshmi, RSR (1999) The integrated Library and Information Science education programmes : Conflict between expectations Vs reality. Ramesh, LSRVC and Nagaraju, AVSS (2000) Restructuring Library and Information Science curriculum for quality assurance in Indian Library services. Singh, Sewa (2000 Library and Information Science training education curricula and national approach. Rawtani, MR and Khan, Shakeel Ahmad et.al. (2002) A regional study of Library and Information Science education in India : Some observations. Vibhuti, Nataraj (2002) Improving teaching effectiveness in Library and Information Science education. Singh, S P (2003) Library and Information Science Education in India: Issues and trends. REITZ (JM) (2004). Dictionary for Library and Information Science. Kumar, PSG (2005) Are we on right line in Library and Information Science curriculum development? Ramesha and Ramesh Basbu, B (2007) Trends, Challenges and Future of Library and Information Science Education in India Tripathi, Tridib (2007) The trends and issues of library and information science education towards developing competencies in digital era : An analysis. Ozioko, R E and Nwabueze, A U (2010) Justification for Library and Information Science Reform. Tariang, Bikika Laloo (2010) Library Science Education in practice. Malhan, I V (2011) Challenges and Problems of Library and Information Education in India: An Emerging Knowledge Society and the Developing Nations of Asia. Tella, A and ISSA, A O (2011). Library and Information Science in Developing Countries: Contemporary issues. Tumuhairwe, Goretti Kabatagare (2013) Analysis of Library and Information Science/Studies (LIS) Education Today: The Inclusion of Indigenous Knowledge and Multicultural Issues in LIS Curriculum.

6. Analysis and Interpretation of Data

The analysis of data had shown the LIS education satisfied the global needs and curricular activities relevant to our regional and national needs. It will also judge the position and qualification of faculties according to norms. It will also reflect light on physical and infrastructural facilities, departmental buildings and financial resources. Finally, it will be investigate the satisfactory level of LIS education of Hindi Speaking Regions is up to expected mark.

- **State-wise Universities**

The present study included more than 150 universities that are imparted education in Hindi Speaking Regions. Hindi Speaking Regions are those where most of the population communicates in Hindi. They are UP, MP, Rajasthan, Bihar, Jharkhand, Chhattisgarh, Haryana, and Uttarakhand. There are total no. of universities that imparted LIS education are 37 among them 06 central universities, 02 deemed universities and rest 29 are state universities but deemed universities was excluded from the study. *(In Jharkhand state, none of the below services as self explanatory with tables does not exist.)*

- **Details of the LIS Education satisfied the global needs:** The purpose of present table is to know the opinions of various *faculty members* of LIS schools about the competencies and skilled of the student are up to the standard exist or not.

Table 1 - Details of lis education satisfied the global needs

S.No.	Items	States : No. of Universities Surveyed = 35								Total	%
		UP	MP	Raja sthan	Bihar	Chattis garh	Jhar khand	Hary ana	Uttara khand		
1	Fully	-	-	-	-	-	Nil	-	-	-	-
2	Partly	13	07	04	05	03	Nil	02	01	35	100%
3	Not at all	-	-	-	-	-	-	-	-	-	-

All faculty members have given the opinion their outcome are partly competent as per the need of globalization, it will be a serious problem and draw a question mark against the existence of LIS education.

- **Details of Curricular/Courses activities relevant to our regional and National needs:** The aim the table was to know about curricular/ courses activities relevant to our regional and national needs.

Table 2 - Details of curricular/courses activities relevant to our regional and national needs

S.No.	Items	States : No. of Universities Surveyed = 35								Total	%
		UP	MP	Rajas than	Bihar	Chatti sgarh	Jhar khand	Haryana	Uttara khand		
1	Fully	-	-	-	-	-	Nil	-	-	-	-
2	Partly	10	06	03	05	03	Nil	02	-	29	82.85%
3	Not at all	03	01	01	-	-	-	-	01	06	17.14%

None of the schools of library and information science was not fulfill all needs of regional and national aspects at the present time.

- **Statewise details of faculty position:** The aim the table was to know actual position of faculties in LIS departments.

Table 3 - Statewise details of faculty position

	State	Position of the faculty			
		Professor	Reader	Lecturer	Contract/Guest
1	MP	02 (HSGU, JU)	06 (HSGU, JU, VU, MGGU) (1,2,2,1)	06 (HSGU, JU, VU, DAV, RDU, MGGU, MPBOU) (1,1,1,1,1,1)	12 (HSGU, DAV, JU, VU, MGGU) (1, 5, 2,1,3)
2	UP	04 (AMU, BRAU,BHU & BU) (1,1,1,1)	09 (AMU,BBRAU, BHU,BU, DBRAU & SSV) (4,1,1,1,1,1)	14 (AMU,BBRAU, BHU,BU, DBRAU & LU) (4,3,3,2,1,1)	06 (CCSU & CSJMU) (3,3)
3	Rajas than	Nil	04 (KOU, MSU & University of Rajasthan) (1,2,1)	04 (KOU, MSU, JNSU & University of Rajasthan) (1,1,1,1)	Nil
4	Bihar	Not available	Not available	07 (KSDSU, LNMU, NOU, PU, TMBU (1,1,1,1,3)	Not available
5	Chhatis garh	01 (MCNUJ)	02 (GGU, PRSU)	03 (GGU, MCNUJ, PRSU) (1,1,1)	Nil
6	Jhark hand	Nil	Nil	Nil	Nil
7	Haryana	01 (KU)	06 (KU & MDU) (3,3)	04 (KU, MDU) (3,1)	09 (KU & MDU) (5,4)
8	Uttara khand	Not available	Not available	01 HNBGU	Not available
9	Total	08	27	38	27

Above table shows that only 8 profesors, 25 readers and 45 lecturers are teaching in 35 LIS schools. Several LIS schools are imparted courses through contact basis / guest faculty.

- **Details of Faculties Qualification:** The purpose of this table was to find out the qualification of faculty in various schools of LIS in Hindi Speaking Regions.

Table 4 - Details of Faculties Qualification

S.No.	Items	Positions :			Total	Percentage
		Professor	Reader	Lecturer		
1	D.Lit	Nil	Nil	Nil	-	-
2	Ph.D	08	25	34	67	19.14%
3	M.Phil	-	-	07	07	20%
4	MLIS (NET)	-	-	09	09	25.71%
5	Any other	-	-	17	17	48.56%

Almost all the faculties have the degree of Doctor of Philosophy (Ph.D) in library and information science. There are some faculties who have extra qualification as certificate in foreign language, MBA, Diploma and degree in information technology, Diploma and degree in computer application and Certificate in e-resources etc.

- **Details of Project/Internship Programme for Students:** The aim of table was to know that how many Hindi Speaking Regions provide the project or internship training to their outcomes. Only 9% schools of LIS are involving in project/internship program.

Table 5 - Details of Project/Internship Programme for Students

ITEMS	States : No. of Universities Surveyed = 35								TOTAL	%age
	UP	MP	RAJASTHAN	BIHAR	CHATTISGARH	JHARKHAN.	HARYANA	UTTARAKHAND		
Project/internship	02	Nil	NA	NA	NA	Nil	01	NA	03	8.57 %

- **Details of Physical Facilities and Infrastructural Facilities:** The aim the table was to shows physical and infrastructural facilities.

Table 6 - actual position of faculties in LIS departments

S.No.	States	Sufficient Physical Facility		Satisfactory Growth Of Infrastructural Facilities	
		YES	NO	YES	NO
1	MP	05	02	05	02
2	UP	10	03	03	10
3	Rajasthan	01	03	01	03
4	Bihar	03	02	-	05
5	Chattisgarh	03	-	03	-
6	Jharkhand	Nil	Nil	Nil	Nil
7	Haryana	02	-	02	-
8	Uttarakhand	01	-	01	-
9	Total	25/35	10/35	15/35	20/35
10	Percentage	71.22%	28.56%	42.85%	57.14%

Only 71% LIS departments have sufficient physical facilities in all aspects to run educational program efficiently and only 29% LIS departments have proper infrastructure facilities.

- **Details of departmental building:** The aim of the table was to know that how many Hindi Speaking Regions universities have its own departmental buildings.

Table 7 - Details of departmental building

Items	Position	States							
Department		UP	MP	Rajasthan	Bihar	Chattisgarh	Jharkhand	Haryana	Uttarkhand
Buildings	Yes	10	3	3	2	3	Nil	2	1
	No	3	4 NA	1	3	-	Nil	-	-
Total	**Yes 24/35**								
	No 11/35								
%	**68.57%**								
	22.85%								

As table shows 69% LIS departments are run in its own departmental building while 23% LIS courses run in other departmental building.

- **Details of financial resources:** The aim of the table was to know that the financial assistance was sufficient or not. 23% LIS departments have sufficient financial resources while 66% LIS departments have partly financial resources

Table 8 - Details of financial resources

Items	Position	States							
Financial		UP	MP	Raja sthan	Bihar	Chattis garh	Jhar khand	Haryana	Uttar khand
Resources	Fully	3	3	1	-	-	Nil	-	1
	Partly	10	4(NA)	3	5	3	Nil	2	-
Total	**Fully 08/35**								
	Partly 23/35								
Percentae	**22.85 % 65.71%**								

- **Details of satisfactory level of LIS education up to expected mark:** The aim of the table was to judge the satisfactory level of LIS education. All states are supported partly.

Table 9 - Details of financial resources

Items	States : No Universities Surveyed = 35							
	UP	MP	Rajasth.	Bihar	Chattis	Jharkh	Haryana	Uttarakh
LIS Education	Partly	Partly	Partly	Partly	Partly	Nil	Partly	Partly

7. **Contemporary Issues:** The contemporary issues particularly in Hindi Speaking Regions:

- The faculty of Hindi Speaking Regions strongly opinioned that the outcomes are partly competent as per the global needs. It is to be a serious problem and draw a question mark against the existence of LIS education.
- The library and information science schools were not fulfill all needs of regional and national aspects at the present time.
- The faculties were not recruited as per national knowledge commission recommendation. Several LIS departments were running through contract or guest faculty. In many schools, there was only one full-time teacher assisted by a few part-time teachers, teaching many courses up to Ph.D level.
- Lack of ICT access to LIS students and faculties.
- The majority of the LIS schools, particularly after the submission of the Curriculum Development Committee (CDC) report in 1992, are offering courses on computer applications theoretical because most of the schools do not have well-equipped computer laboratory.
- New LIS schools are opening at a fast pace without the basic minimum facilities, resulting in mass production of professionals with sub-standard education and having least or no exposure to practical librarianship thus, creating an increasing problem of unemployment in the job market. In some universities, the trend of self finance has started. This has resulted in passive teaching-learning processes. Competition in the job market is increasing day by day as production is much more than the demand.

- Only few schools of LIS were involving in project/internship program.
- The LIS schools are not having sufficient physical and infrastructural facilities. Lack of financial assistance to the departments. Lack of financial resources to augment and adopt the latest innovative means.
- Lack of a unique accreditation system has to be monitored.
- The Satisfactory levels of LIS schools are not up to expected mark.

8. Suggestions and Recommendations:

- It is recommended that there is a need to reorient Library and information Science Education to reflect global changes and evolving market demands. There is a need to maintain interaction and collaboration LIS students and the faculties to create dialogue for students' field work and internship. Fieldwork training to be introduced for LIS students so as to impart practical experience and give them opportunity to practise what they learn in classes.
- The curricula have been found to be good but there are a number of constraints as observed to the implementation to make the curriculum meaningful and produce the needed result. Due to lack of adequate faculty strength Hindi Speaking Regions library schools are letting the courses go on as they are going on.
- The standards and norms of education are prescribed and adherence to them be made mandatory. Unfortunately, there is no national accreditation body for LIS education. The curriculum should be geared towards meeting local, national and international information needs for development and align it to the expectations of the job market and to produce such manpower that can multitask. Some courses should be imparted by practising librarians, while the faculties should undertake practical attachment in libraries in order to update their skills and keep abreast with market trends.
- The curriculum is ever expanding and developing. But there is still the need to teach the basic fundamentals of the subject, ensuring that manpower are equipped with the skills and knowledge to undertake the activities that will be expected from them in their library and information field. They should also be equipped to address complex information problems, encompassing the skills needed in the rapidly expanding virtual world.
- The teachers handling the training of the students in the Hindi Speaking Regions library schools need to be re-trained in the modern theory and practice of information and communication technologies if they are to meet with the demands of the society and the job market in the next millennium. There is no doubt that in the 21st century, the job market both locally and internationally is likely to become more complex. Therefore, only expertise can get successful employment.
- There is a need that all the organizations running LIS courses without adequate facilities be abandoned. It is desirable that the library schools in India should adapt themselves to the changing situations so that they can turnout better outcomes who can meet the challenges posed by the changing environment.
- The System of apprenticeship or practical training must become an essential component of the programme, to make the students proficient to handle the live situations of practical librarianship. There is also a need for more practical orientation and learning by doing provisions in the present courses of study. This is possible if some provision of internship is kept at all the library schools
- Better schools having adequate finance, physical and library facilities, equipment, and qualified and experienced faculty is the need of the time. The LIS schools should aim at educational excellence capable to successfully perform their role in the fast changing information needs of the society using new information technologies.

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LIS Education requires both classroom teaching and also Internship for the full benefit of the LIS Profession

Kabita Mukhopadhyay



The main objective of the study is to pick up the main lacuna of LIS education in the present situation. The changing and challenging environment of Library and Information world is urgently needed the vocational training to meet the demand of the profession. Not only the classroom teaching is sufficient, it also requires the Internship like the medical practitioner.



LIS education, Challenging environment of LIS world, Class Room teaching, Internship.

1. Introduction

The main objective of LIS education is to prepare the library professionals in such a manner, that they can able to accept the challenges of the present time, specially when the world revolutionized by different type of informations and the students of library sciences should be trained up in such a manner that they can able to face the demand of changes taking place in the universe of knowledge. Following Dr S.R. Ranganathan, LIS education should be of demand based and the students should be trained up in such a manner that they can meet the challenges of the future.

2. Objective of the study

To understand the actual lacuna of LIS education in the perspective of its practical application I have done a survey, one in the year 2007 and another in the year 2012. Survey of 2007 was mainly based on the direct interview of the LIS students and the report of the survey 2012, was mainly based on the close observation, and face to face consultation with the new professionals of the field.

AS a library professionals as well as councillor of Netaji Subhas Open University (NSOU) my experience expresses the opinion that library and information science is such a practical based paper which is in need proper vocational training for its successful application. The paper like classification, cataloguing, indexing and others require practical classes but not only class room based practical classes but also require vocational training where the students gather knowledge at the grass root level. Only this knowledge can help the library personnel to work successfully.

3. Opinion of the new professionals in the field

Hardles before the new professionals: Since 1990 a rapid changes have noticed in the field of library profession, especially due to the huge application of IT in this field. This IT field is developing with changing and challenging demand of the information requirement.

This IT field demanded the practical knowledge of the professionals, without vocational training one new comer cannot able to cope with the demand of the practical field. A professional should be motivated by the challenges of their jobs and desire to serve the community and their descripline. The carricula of LIS education in different institute are confined within classroom teaching.

4. The result of the survey

The students of LIS (The University of Burdwan and Netaji Subhas Open University) education are very much interested to take a practical training, attach with any Academic library after the end of their class room teaching and before getting the final pass certificate.

The opinion of the new comer is something exceedingly unhappy because they are not able to take a confirm decision, how and from where they start their work successfully. They will take a hard situation to tackle the different technical work, specially the work related with traditional library work to digital world, that is a complete changed environment.

As per my practical experience, many newly joined professional visit my library off and on to gather a laboratory experience from my working place and they also try to acquire a practical knowledge from a running library.

5. Requirement of the LIS education

From the survey as well as empirical observation it is comes to light that just like Medical education and Law education Library and Information Science also require Internship course before the completion of the course. The suggestions may jotted down one by one :

- The LIS education should have a practical oriented curriculum and have every opportunity to get a practical experience from the study.
- The practical knowledge of the professional should be incorporated with the LIS education, which may help to bridge gap in between the theoretical knowledge and practical experience.
- The different university and adjacent college library should be used as laboratory for practical training of the student. Just like the 'physicians' the LIS students also have a chance to remain as Interne in University library or college library or may be in a District Library.

6. Conclusion

The socio-economic environment of 21st century is mainly depends on different type of informations. The unprecedent growth of Information generation has led to the transformation in libraries and information centres. To give the efficient and right time information services the information professionals should dependent on new technologies and gadgets. At present the library includes different sophisticated tools which make it easy to find the best information resources and services. To make successful the professionals the LIS education should not only confined within the class room teaching, it requires also internship.

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Postmodern Trends in Library and Information Science

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In this paper an attempt has been made to trace the post modern trend of Library and information science.Traditional concepts of knowledge, meaning and communication in library information science are facing a crisis; they are unable to adequate characterize and structure the experience of interacting with the modern academic library. The emergence of this crisis has been preceded by the advent of sophisticated information storage, processing, and retrieval technologies that are significantly transforming the nature of the library experience for both the librarian and the user. The epistemology of library science must become explicitly recognized as a significant problem to be addressed by library scholars.



Post modern trends, Libray Scienc

1. Introduction

Very often it is said that the modern age, that great edifice which like a colossus bestrode first the Western World and then the entire globe, has modern era. It is the approach that includes the creation of atmosphere, an, atmosphere which approaches man in his essential nature. In the first place post-modernism gives us the opportunity of looking at our own thoughts and seeing to what extent we have compromised with modernism in our own thoughts and seeing to what extent we have compromised with modernism in our own understanding of things. Postmodernism can be recognized by two key assumptions. First the assumption that there is no common denominator in nature or truth or God or the future those guarantee either the One-ness of the World or the possibility of natural thought. Second assumption that all human systems operate like language, being self reflexive rather than referential systems.

Postmodernism designates a multitude of trends – in the arts, philosophy, religion, technology and many other areas – that come after and deviate from the many 20th century movements that constituted modernism. Widely debated with regard to its meaning and implications, postmodernism has also been said to relate to the culture of capitalism as it has developed since the 1960. In general, the postmodern view is accepting of the fragmentation on contemporary existence. Postmodern architecture, in distinction to the view of Modernism an orthodox, austere and formally absolute, is characterized by the incorporation of historical details in a hybrid rather than a pure style, by the use of decorative elements, by a more personal and exaggerated style, and by references to popular modes of building. Practitioners of postmodern architecture emphasizes elements of metaphor, symbol and content in their thinking and their work. They share an interest in mass, surface colors and frequently use unorthodox building materials. "Any of several artistic movements since about the 1960s that have challenged the philosophy and practices of modern arts or literature. In literature this has amounted to a reaction against an ordered view of the world and therefore against fixed ideas about the form and meaning of texts. In its reaction against Modernist ideals, postmodern writing art emphasize devices such as pastiche and parody and the stylized technique of the antinovel and magic realism". Postmodern... implication!

Post-modernism has many interpretations and no single definition is adequate. Different disciplines have participated in the post-modernist movement in varying ways... In literature, writers adopt a self-conscious intertextuality sometimes verging on pastiche, which denies the formal propriety of authorship and genre. In commercial terms post-modernism may be seen as part of the growth of consumer capitalism into multinational and technological identity. In architecture, traditional limits have become indistinguishable, so that what is commonly on the outside of a building is placed within, and vice versa & quot; its all-embracing nature thus makes post-modernism as relevant to street events as to the "avant grade", and is one of the

major focal points in the emergence of interdisciplinary and cultural studies. Traditional concepts of knowledge, meaning and communication in library information science are facing a crisis; they are unable to adequate characterize and structure the experience of interacting with the modern academic library. The emergence of this crisis has been preceded by the advent of sophisticated information storage, processing, and retrieval technologies that are significantly transforming the nature of the library experience for both the librarian and the user. The epistemology of library science must become explicitly recognized as a significant problem to be addressed by library scholars.

2. Rationality, Order and the Search for Truth

In the Western literary tradition, the library has long been taken as a metaphor for order and rationality. It represents, in institutional form, the ultimate realization of a place where each item within it has a fixed place and stands in prior relationship with every other item. The rationality of the library in many ways represents the description of nature idealized by the institutions of positivist science. As the library imposes a completely consistent system upon a collection of unique texts, so positivist science seeks the system by which unique observations derived from nature can be ordered and classified according to a set of general principles.

A library is a place where knowledge is first classified and then kept, stored in texts of all kinds such as books, periodicals, and audiovisual materials. Such an understanding imposes a rigid structure of expectations that come to define the library experience for both librarian and library user. The reference interview, for example, comes to represent an interface where texts, and hence their information, can be located and acquired. Indexes, catalogs, and other information retrieval systems act as road maps to navigate this environment of knowledge. For both positivism and the library, the dominant metaphor is that of "the search". In the library, the search is among structures for a truth that will alleviate a specific "information need". The structure to be discovered/searched is preordained, either by a supreme being or by a librarian. Indeed, the image of the "librarian-god" is common in the literary portrayal of the library.

This stereotype behaviour may, at first glance, seem trivial and unimportant, but library practitioners seem to be at a loss as to how to change this). Such images serve to reinforce, in their very triviality and harmlessness, a particular network of power relations that connect the librarian, the user, and the text. In this network, the librarian's domain is that of the creation and maintenance of order, and the library user represents a threat to that order.

Eco's fortress library is a place of ultimate rationality and order. It represents a universe of knowledge, truth and moral order unto itself. On one level, one can describe the librarian's role as simply a guardian of the texts who keeps the physical books ordered and safe from harm. It is the librarian, and the librarian alone, who determines the truth of an individual text through his knowledge of where that text is located in the labyrinth. In the positivist world view, "truth" of an event in the world is "discovered" by understanding its relationship to other events according to the rules of an underlying structure that cannot be observed directly. In Eco's positivist library/labyrinth, the "truth" of an individual text is known relative to the underlying classificatory system of the library. It is this system that is so fanatically protected by the monks in Eco's novel, even to the point of murder. Both systems are known only to "experts" (the scientist, the librarian) who have had the appropriate training. Only the librarian can make appropriate inferences regarding the "truth" or relevance of an book given their privileged knowledge of the underlying system of classifications.

In contrast to the librarian, the library user is a person who must disrupt and ultimately prevent the realization of the ideal library. There is an inherent and powerful tension between the ideal library's goals of order and completeness with the goal of providing a user with service, since allowing texts to circulate inevitably introduces disorder. Such tensions structure the experience of the modern library environment for both librarian and user. Users are often overawed by the library. The sheer volume of texts the library contains is intimidating enough, but an equal, if not greater, problem is how to navigate within and around

these texts to find the one that is needed. The user must engage with the rationality of the library directly and must submit to its version of the order of things before the user can find what he/she needs. It is claimed by their creators that such systems of classification are designed with the goal of facilitating access to texts. However, viewed in the context of the tension between maintaining order and providing service, such systems can also be perceived as barriers that serve to deny that same access. A user will usually feel confident that the needed text or information is available in the library. However, the prospect of embarking on the tortuous path that must be traversed in order to locate that text may evoke a sense of fear and uncertainty.

Post-modernist philosophy took its origin from the anti-humanist novels and short stories of the 1950s and early 60s. But as a philosophy it has attacked man chiefly on the level of his rationality. Post-modernism has attacked modernism's grand schemes or meta-narrative *because* post-modernism has called into question the idea that man is capable of seeing the truth enough to construct such intellectual edifices. Post-modernism is deeply hostile to systems or schemes that purpose to *describe* reality, because they are seen as in fact attempts to *prescribe* or *circumscribe* reality, to control others by setting up the bounds of reality and thus of behavior. Not only the statement of grand meta-narratives, but "any claim to the theoretical pursuit of truth will raise the question: What is *really* behind this claim? As we will see below, post-modernism is generally not interested in arguing truth claims, but simply refuses to accept their possibility.

Table 1 : The Modern and Post-modern periods of Information

The Modern Era	The Post-modern Era
Read	Interact
Write	Orchestrate words, sounds, graphics
Not enough information	Too much information
Finding information	Filtering information
Information expensive	Information free
Linear growth	Exponential growth
Databases	Portals
Static, final version	Many changing versions
Letters to the editor	Chat rooms
Author intermediated by publisher	Author is publisher
Scholarly journal	Web site

Post-modernism, like information society theory, is a complex field with many different conceptions that are too numerous to discuss exhaustively here. Post-modernism is the cultural backdrop for the information society. It can be considered an artistic movement-one that breaks with modernism. He roughly defines post-modernism as a rejection of grand narratives and claims it is the cultural equivalent of the post-industrial society. Post-modernism offers a worldview that emphasizes the individual and celebrates relativism.Libraries should be particularly concerned with post-modernism's hostility towards "anything which smacks of arrangements ordered by groups" and "judgments from anyone on high" (Webster 233). Classification schemes are seen as disingenuous in the post-modern view. We are trying to impose the grand narrative of organization on our varied resources. Through its rigid classification system, the library imposes its privileged understanding onto all knowledge and inadvertently creates an image that is decidedly un-post-modern and therefore distasteful to members of the information society. Because they celebrate relativism and reject universal truth, post-modernists also suspect the notion of an expert. Librarians must recast themselves without espousing our expertness, without claiming that we know the only correct way to conduct information seeking.

Societal transformation, as seen in theories of the information society and Post-modernism, examines movement not only in labour trends and technological developments, but also in culture. The economy has become more dependent on information and postmodernism has emerged and flourished in

this environment. All of these factors should be considered when rethinking reference and instruction in academic libraries. The scholarly workstation has revolutionized scholarly work. Today, one may assume that younger scholars in the industrialized world possess access to the Internet from their desks. Shortly, the generation of computer-shy older scholars will have retired. Meanwhile, a large proportion of the world's scholars will become plugged into the web. The active desktop metaphor of obliterates the distinction between local files and hypertexts on the Web. File transfer protocols permit scholars to share documents. Listservs, bulletin boards, newsgroups, chartrooms, electronic conferencing, etc. have turned the scientific community into a global village. The technologically advanced scholar can turn his desktop computer into a web server. There is no longer a problem of disseminating hot, new information.

The scholar as publisher can now advertise and disseminate his work to the web public. The personal web site plays to the scholar's hunger for recognition. Students worldwide are attracted by a scholar's personal collection of documents and links. During the Renaissance, students would travel for months to be present at a lecture by an academic superstar like Galileo. During the Modern period, one had to subscribe to costly scholarly journals. In the 21st century the academic superstar scholar/publisher will transcend the constraint of the academic journal as well as the institutional constraint of the university by attracting digital pilgrims to his web site. We are about to enter the Post-modern information era when scholars will be information entrepreneurs.

University libraries and university administrators recognize that the digital revolution will reduce their costs. Extraordinary serials inflation are driving universities away from paper subscriptions and towards digital copies. Universities will seek to retain the intellectual capital of their scholars, instead of buying it back from publishers. In the Post-modern information era, universities will work to retain the scholarly products of their faculty, package these as courses and vend these as products. This practice has already been established in the Modern period by the Harvard Business School that vends books, business cases and other products of its own faculty. The Association of Research Libraries maintains a web site to chart the impact of changes of electronic scholarly publication on research libraries.

The digital revolution has also changed the nature of documents. Scholars can now accessorize their writing by including active objects like applets, scripts such as JavaScript and VB scripts, hypertext links, database interfaces, spreadsheets, images, etc. The typical scholarly product is now a hypertext, or a cluster of hypertexts. Scholarly journals can not compete with the Web in either speed of transmission or complexity of scholarly product. As older print-bound scholars retire, a new generation of Web-sophisticated scholars will seek Web-based channels of communicating. For scholarly journals still clinging to the print paradigm, this is asteroid time in dinosaur land.

The Post-modern period is characterized by free and plentiful information that originates on the desks of the world's scholars. By the year 2000, 75% of all data will be born digital collections. The "portal" paradigm supersedes the database paradigm: Moreover, as television, telephones and computers converge into one integrated network of communications and entertainment, companies of all sorts see portals as a possible key to the future strategy. The power to funnel users to certain advertisers and content sites is worth millions of dollars in revenue. The search engines have become to the Internet what Windows is to the computer desktop.

Clearly the "journal serving the Post-modern information science community will be web based, not paper based. As the embedded links in this essay illustrate, authors will use active content that can be only fully utilized online. Given that changes in technology are the intellectual substance of information science, one can anticipate authors illustrating future scholarly essays by dynamically linking to interfaces, portals, web tools, etc. A paper journal in an academic field that turns on information technologies is simply non-competitive. We must invent "JASISWeb."

What would be the relationship between JASIS web and the articles that now constitute the journal? The only reasonable economic model is to give these articles away free. For example, this essay will always be

freely available from my web site. By putting this essay away free to the world, what possible economic model could a publisher employ? Who would pay money for a copy of this essay when it is available free? Publishers get anxious at proposals to give articles away free because the prevailing economic model in the Modern period was selling these same articles. In the network economy, however, these articles are no longer are our product. They are merely advertising that draws as worldwide audience to the JASIS products:

- **Personality** The worldwide audience will visit the JASISweb to interact with authors. One may interact with an author via a chat room, or vicariously by viewing the earlier versions and ancillary documents of authorship. This is not a new phenomenon: Media stars and personalities already make themselves available for chat at specific times on the web. Web sites devoted to one topic are common; Each "article" in JASISweb would be a separate address where one could find earlier versions, author reflections, reader comments, author responses, etc. The accumulation of traffic at the site of an "article" would indicate its importance.
- **Experience** The worldwide audience will visit the JASIS web to experiment with information science tools, programs and processes. Our distinctive expertise is information science processes and programs. Scholars will visit the site to view most avant-garde information science technology.
- **Context** The worldwide audience will visit the JASIS web for our selection of information science links. As an expression of our expertise, these links to documents, people and other sites will reflect our information science view of the Internet world.

The competitive advantage of JASIS web is that the world considers us masters of information science. The world will travel to JASIS web to find the wealth of information science laid out before them: the people and their writings, exemplary tools and engines and the links that express the information science perspective. This is what we have been doing for fifty years. It is time to transform our journal to continue the task in the Internet age of the 21st century.

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Reinventing Academic Libraries in the Digital Environment for e-Teaching and e-Learning

Leena Khullar



The use of information and communication technologies (ICT) has become a vital part of teaching and learning in Higher Education. This paper is attempt to find out the use of information and communication technology [ICT], through academic libraries in e-teaching and e-learning. Its key focus and emphasis is on how the academic libraries influence the changes in teaching and e-learning. Understanding the impact of e-teaching, e-learning and e-education is seen as fundamental in moving forward so that we can make greater use of the opportunities provided by the Internet. This paper points how the modern academic libraries provide technology based information anywhere, anytime besides providing resources for innovative and lifelong learning. It also discusses the way the modern academic libraries are related to e-learning and how librarians can help in providing services and material for e-teaching and e-learning.



Academic libraries, e-education, e-learning, e-teaching, ICT, digital libraries.

1. Introduction

Academic libraries are considered to be the nerve centres of academic institutions as they support teaching, research, and other academic programmes in various ways. They act at various levels (national and international), to ensure that the knowledge can be put forward in e-learning for the benefit of teachers and learners directly. With the advent of computers, the nature of libraries and information centres has changed dramatically. Computers are being used in libraries to process, store, retrieve and disseminate information. As a result, the traditional concept of library has changed. Today library is not only a place to access books but it has also become an advanced media centre which includes CD-ROM, Internet, and remote access to a wide range of resources. Libraries have now been changed into digital institutions. Gone are the days when a library was judged by its quantitative resources. Today, libraries are surrounded by networked data which is connected to the vast ocean of Internet-based services. Similar is the case with e-teaching and e-learning.Demographic changes, technological advances and globalization have totally changes the concept of education. In today's senario what is important is not only to implement e-teaching and e-learning in academics but how to get the best out of it.

2. E-teaching and E-Learning

E-learning is an approach that utilizes the web and technology tools to facilitate communication and learning in a collaborative educational context. It enhances the learning experience, facilitating peer-learning and granting independence of study. E- learning also collaborate, build and discover new learning communities and explore newer resources in their interaction with information, materials and ideas with their students and colleagues.

The e-education involves e-teaching and e-learning along with the various other administrative and strategic measures needed to support teaching and learning in an online environment. It will incorporate a local, regional, national and international vision of education. Again, e-learning comprises the acquisition as well as use of knowledge distributed by electronic means. "E-learning is Internet-enabled learning. It provides faster learning at reduced costs, increased access to learning, and clear accountability for all participants in the learning process".But it can also isolate the learners, depriving them of the social support of a conventional classroom.A comparison of some aspects of conventional learning and e-learning are shown in Table 1 below:

Table 1 - Aspects of conventional learning and e-learning

Conventional learning	E-learning
Students attend a school in their local community or attend a boarding or correspondence school. Classes are scheduled according to school hours and timetables. Classes are synchronous. And teachers and students interact in real time. Students are generally enrolled with one school. Teachers work in one school.	Students participate from a variety of locations and may "attend" multiple learning institutions and/or their local school. Students may determine the times when they access e-learning opportunities. Classes may be synchronous or asynchronous. Students may take classes from more than one school. E-teachers can work in more than one school.

3. E-Learning and Teaching Resources

- **LearnHub**: LearnHub is a network where members can create their own communities, share lessons, chat and teach each other, free of cost. In learnHub,schools create their own virtual classrooms where students complete assignments, play games and share photos and text.
- **Moodle**: Moodle is a free open-source course management software,which is designed to help teachers. Microsoft Education Labs recently announced a new Live@edu plug-in for Moodle. it provides lesson plans, assignment and quiz-making tools for teachers. Teachers can also access some other sources like Outlook Live for e-mail, Office Live Workspace for document sharing, and Windows Messenger for chat and Windows Live SkyDrive for 25 GB of storage.
- **YouTube Edu**: YouTube Edu allows students and teachers to access lectures from leading educators across the country. One of the most popular Channel of You Tube Edu is the National Programme on Technology Enhanced Learning - a collaboration launched by the Indian Institutes of Technology and Science in Bangalore.
- **Scitable**: It has been launched by Nature, to help high school and college students, in the field of science. In scitable teachers and students can upload their contents for exploration and discussion at wider platform.

4. Advantages of e-learning

E-learning is mainly used for distance learning and can be collaborated with face-to-face teaching, which is commonly termed as "Blended learning".

- Main aim and advantage of e-learning is flexibility, convenience and the ability to work at his place where internet connection is available. Thus e-learning allows learner to learn conviniently, in accordance with his/her daily commitments.
- Secondly, e-learning courses are economical as compared to face to face teaching; learners don't have to pay again for repeating the e-learning course, as in case of classroom teaching.
- Thirdly, learners can communicate wih their teachers, other fellow beings,and their course class mates, from far off distances, which is not possible in case of class room teaching.

Though e-learning has a capacity to remove many barriers and hurdles faced by traditional learning, but the best approach is to combine the best of human and machine teaching and mentoring capabilities.

5. Disadvantages of e-learning

- In the case of e-learning, face to face interaction, with teacher is not possible.
- E-learning has totally abolished the concept of "Guru – Shishya (student-teacher)" relationship.
- Lack of human interaction (among student –teacher, among student-student)is also felt by e-learners, though they have audio or video based web conferencing programs. E-learning and ICTs can educate people but they can't embed moral values in them, which are essencial in becoming good human citizen, above and over good human being.

6. E-learning activities

Information available on the Internet and the institutions offering e-learning programs reveal that the most e-learning activities are related to supplementary on-campus courses at initial level. Studies reveal that Information Technology and Business Management are the two disciplines, that are making significant use of e-learning.

In the developed countries, Universities are more interested in improving their on-campus programs by using e-learning to offer more flexibility and content. Institutions worldwide have adopted learning management systems (LMS)-software developed for administration and teaching. This software enables the institutions to treat enrolement data electronically, offer electronic access to course materials and carry out assessments as well as offering online interaction between faculty and teaching. Two leading commercial vendors of LMS software (Blackborad and WebCT) are significant, but now days there is a trend of "open source" software. Although, the multiplication of software platform for e-learning reflects the novelty, and dynamism of LMS,it also represent a waeteful duplication of effort. It might correspond to an over-emphasis on the technological infrastructure, when the real challenge lies in making innovative and effective use of the functionalities offered to faculty and students.

7. Academic Libraries and E-learning

According to Thomas K Storey, Corporate Communications & Public Relations OCLC Online Computer Library Center " Libraries are keenly interested in integrating their systems and services into learning management systems environments because today's students are creating e-portfolios to organise and track their work. They wish to search and discover from within the learning management system and create dynamic information and learning sets on the fly. Integration efforts will have to accommodate these organisational and learning activities".Academic libraries serve the educators, including the new generation of teachers who works in an Internet environment in both regular and virtual classroom situations.Academic librarians generally serve the subject experts in providing information regarding teaching, learning and research. Now days, e-learning has been integrated in the curriculum of most of the universities. From the library side it has been a great opportunity to integrate the library resources and services in support of learning, teaching and research. Most of the modern academic libraries are digital and e-learning can effectively take place in a digital environment.

The academic libraries should also take an initiative towards building of an e-learning support centre would involve training of the academic staff .As a part of this initiatives an **educational technology unit** will develop which includes smart classrooms, along with video conferencing and assignment tools. They (tools), which will enable flexible learning and teaching of students while sitting at their own place. As faculty and instructors have started adopting e-learning strategies as a part of their teaching schedules, libraries are also playing a key role, by helping them in finding and organizing resources to complement programmes and courses. OCLC have suggested that resources must be integrated for academic libraries at the point of need to make these more effective.

8. Role of academic libraries in e-learning

The teaching-learning is a delicate process which needs to be standardized throughout the world. ICT and academic libraries can help in this standardization, as academic libraries are now in the digital era. So these libraries are in capacity to enhance its services and help the faculty and students in the process of e-learning, through e-publications. Large number of e-publications have been brought out through the world,which are easily available in the publisher's website via Internet. Today's libraries have been redesigned, with the application of IT equipments, by creating local area network and procuring required hardware and software.

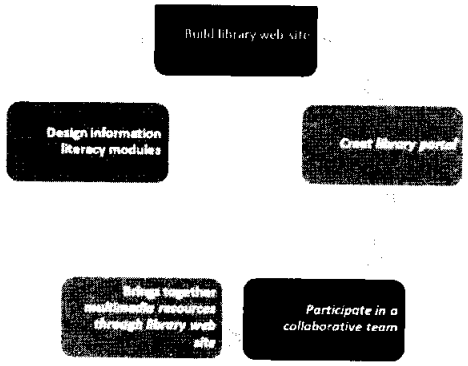
Some famous publishers have created state-of-art IP based searching and linking functionality and navigation through simple user interface. Academic libraries are procuring those e-publications, which are best suited for its users. Presently available e-resources are of various types: standards, patents, gateway portals, e-journals,e-databases, e-books, e-reference books etc. some of the prominent e-resources are listed below, along with their websites.

- **Indian standards** are available in CD-ROM.
- **Indian Patent** Databases are available on Internet at http://www.indianpatents.org.in. Patent database are also available on CD-ROM.
- **Gateway Portals:** it includes published journal articles, abstracts, reports, technical magazines, international news papers etc. Some of these gateways are:
- **J-Gate**: it is a multidiscipline gateway. Website is www.j- gate.informindia.co.in
- **JCC@Indest**: it covers various subjects. Website is www.jcc- indest.informindia.co.in/
- **SciGate:** it covers disciplines of science, engineering,medical and management. Website is www.ncsi.iisc.ernet.in
- **OpenMED@NIC:** It covers medical and allied sciences. Website is www.openmed.nic.in/
- **E-Journals:** Full text articles from journals, periodicals, conference proceedings and citation indexes are available on different subjects. Some of these resources along with their websites are listed below:
- **ASME Journals:** it covers full text journals and transactions in mechanical engineering. Website is www.asme.org/Publicatios/journals/
- **ASCE Journals:** Civil engineering journals and periodicals are available. Website is www.asce.org/journals/
- **Science Direct :** it covers journals, magazines, abstracts, citation links, conference proceedigs on computer sciences, physics etc. website is www.sciencedirect.com
- **Project MUSE:** It covers different subjects, mainly humanities, social sciences and literature. Website is www.muse.edu/journals
- **E-Databases:** many bibliographical e-databases on various subjects like chemistry, physics, mathematics, computer science, microbiology etc are available. Some of these are mentioned below:
- **MathSciNet:** Database of more than million abstracts and reviews of mathematics publications. Website www.ams.org/mathscinet/
- **SciFinder Scholar:** it includes Chemical Abstracts. Website www.cas.org/products/sfacad/index.html
- **CAB Abstracts :** database covering millions of records ofplant sciences, agriculture, microbiology etc. website www.cabi.org/

Academic libraries apply these communication technologies in support of e-learning and e-research by providing seamless access to electronic resources like online catalogues, databases,multimedia, online journals, digital repositories, electronic books, electronic archives and online electronic services. The utilization of these technologies and services by academic libraries has benefited both on-campus, part time as well as distance teachers and learners. They (teachers and learners) can be benefited by undertaking learning and research without being in the library.

- **Steps to start up with e-Learning in libraries**

The demand for e-learning is growing day by day. As a result, library services have taken on another dimension. Following are the steps to start the process of e-learning, with the help of libraries:



- Build a **transparent library web site** where navigation to help tools is easy and direct.
- **Create a library portal** on each course-specific web page. Design a standard library template that is offerd as one of the course tool modules when websites are being populated. The library page should include descriptions of key tools in the discipline, links to databases, electronic reserve readings, bibliographies, help guides, and contact information for the librarian specialist in that area.
- **Participate in a collaborative team** to enhance a course with some aspect of learning technology.The librarian played various roles from project manager to resource collector and navigator and technology teacher.
- **Create a library website that brings together multimedia resources** that faculty could integrate into e-learning modules or use in the classroom
- **Design information literacy modules** for specific online or face-to-face courses. Use activities, which support course content and extend information finding, analysis, and evaluation in a particular subject area.

9. Services of academic libraries

The librarian of academic library plays a dedicated role in supporting teachers and learners in e-education by providing tools and services to them. As a part of e-learning, an academic library must provide the following **services** to its users (students and staff).

- **E-mail** new acquisition list to the heads of concerned departments regarding arrival of new books of their concerned subject and intrest.
- **View your patron** record to see materials borrowed by an individual user with an option to renew the borrowed materials without visiting the library.
- **Request for materials** that are borrowed by another user. Upon return of the material, communication is sent to the user who made the request to come and borrow the material.
- Users can suggest additional items that the library should acquire based on their needs. This request can be made online.

- Materials placed on **reserve** by lecturers for specific courses.
- **E-mail communication** is provided through the system to enable a two way communication between the user and the library.
- **Online charges and fines** are made available to users.

Many librarians especially university librarians are working with online course developers as well as instructors in traditional courses to provide online guides and help for library research.

10. Conclusion

E-learning is mainly associated with the field of advanced learning technology (ALT), which deals with both the technologies and associated methodologies in learning using networked or multimedia technologies. 'E-learning has created an environment in which change is the norm culturally, institutionally and technically', says Ms Albanese.In the digital educational environment, libraries are challenged to integrate and expose their services and content into the e-learning system, as well as take on new duties, such as creating content and managing digital repositories.Librarians are also taking a leadership role in creating new knowledge bases and assisting faculty and students to build and structure specialised databases. E-content supports e-learning and is considered to be a heart of e-learning. Online articles, streaming video, audio segments, images, specially designed websites and unique learning objects - these electronic elements are created to enhance courses and improve learning. An Academic Library must have an effective e-learning strategy and a good combination of the technology and the content it carries.It is quite understandable that an e-learning environment can provide both students and faculty with a sustainable infrastructure and seamless access to knowledge, course content, information resources and services. Librarians and academicians should collaborate to evaluate and provide links to authoritative web resources related to programmes and courses taught.

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Relevance of Dr. S.R. Ranganathan Five laws of Library Science at Present Scenario in the Electronic Age

Subrata Bose **B. Naga Mohan Rao**

Abstract

Function of any library is to acquire reading material relating to the interests of the users and organizing the collected material in such a way that they should be readily available to the users. It is not possible for individual to collect required information/documents. It is confirmed that the libraries are playing a crucial role in the information organization and dissemination. Dr. Ranganathan'sfive laws, on the other hand, provide a paradigm of how libraries function, how they grow and serve and provide us a frame work through which to examine our libraries. This paper analyses, relevance of Dr. Ranganathan five laws of library science at present scenario.

Five Laws; Dr. Ranganathan; Information Laws; Library Science

1. Introduction

Computer has influenced many fields and information activities of the library, an interpretation was created that the computer is capable of doing many library operations. Documentalists have been attracted by computer mainly for speed in handling of data and the ability to provide the answer in the form of print (Guha,B, 1983). Many people see a 'library simply as a bunch of books on the shelf, most with numbers and letters to their spines. They also understand that there are rules regarding checkout and other procedures. Both the call numbers and the rules usually are seen as manifestations of librarians, near compulsive capacity for organization. Truth is that rules are for the benefit of patrons and follow logically from the laws of library science. Any collection of books that is effective, functional, or useful abides by the laws of library science (Leiter,R.A, 2003) In 1931 Dr. S.R. Ranganathan formulated the laws of libraries and its users. 'Profound messages are hidden in these laws and it is likely that this profoundness will continue to increase as librarianship advances further' (Jayarajan, 1992) The five laws of library science are ;

- Books are for Use
- Every Reader his or her book
- Every book its reader
- Save the time of the reader
- Library is a growing organism

Presently the study is on the relevance of the laws of library science at present situation. 'Books, reader, and library are the basic elements of Ranganathan laws still work very well. (Noruzi, 2004).

The attitude and, information requirements of the readers have been changing rapidly. The word 'Information' replaced the term of documents/books. We can examine the laws in terms of changes taking place. Cloud computing has large potential for libraries. Libraries may put more and more content into the cloud. Using cloud computing user would be able to browse a physical shelf of books, CDs or DVDs or choose to take out an item or scan a bar code into his mobile device. All historical and rare documents would be scanned into a comprehensive, easily searchable database and would be accessible to any researcher. Many libraries already have online catalogues and share bibliographic data with OCLC. More frequent online catalogues arelinked to consortium that share resources.(Gosavi, et.al. 2012).

2. First law Books are for use

This law emphasizes that library is not only a store house of the books. It should be service oriented. Because 'closed access, if not chained libraries, highly restricted use. Libraries run by scholars or clerical staff was the rule of the day' (Jayarajan,1992). Presently the law can be read as :

2.1. Information for Use

The word books to be replaced with the term 'information' because the concept of the book is disappearing, now a day's no user intend to use conventional document for a piece of information he required. Hence, the role of libraries changing in-terms of collecting documents to collecting information. The library hours, library furniture, library staff, cumbersome book selection processes has been changed. Now libraries role is to collect information, store in electronic format provide online to the required users. Facilitates retrospective search and selection of documents as and when demanded by users. However, librarians must know that users, their needs, and materials for their research or that they wish to read. Information must be appropriate to the needs of all the users. The librarian must keep needs of libraries in mind, they should make sure that user can find the information needed easily. It means the librarian not only familiar with the conventional document, he must also well aware about the electronic equipments and electronic resources to make information for use. 'library that is open to the public, eliminates print resources in favour of an electronic version of the material that is only accessible to certain users with passwords are all modern equivalents of chaining books to the shelves. And all bring into question whether the library is adhering to the first law (Leiter,2003).

3. Second law Every Reader his/her book

This law emphasizes organized cooperation between libraries at different levels, ensures the use of resources providing library services to all the users. 'A library must formulate policies that ensure that the collection it is building and maintaining is adequate to fulfill the expectations of its users. In other words, the collection must be appropriate to the library mission, (Leiter, 2003). This law can be read as;

3.1. Every information for his/her use

This has many implications for the information. They reveal that the fundamental need for balance between making information resources and the basic right of all users to have access to the information. This means information dissemination and diffusion important. The most important task of the library is to collect information, keeping in view of the need of the users. Means are limited, wants are unlimited. Hence, proper choice of information is essential. It is not the size of the information collection, but the choice of the information collection that helps in the fulfillment of the second law.

4. Third law Every book its reader

This law emphasizes that every document/book there must be a reader. The emphasis was on book selection, access to documents, shelf arrangement, cataloguing etc. this law can be read as;

4.1. Every information for its users

Here we find two changes, one 'Information' replacing the word 'book' and 'reader' replacing with the 'users' because the term 'book' restricts the choice of the users, where, the 'information' gives elaborate access to the contents. The term 'readers' can be replaced with the 'users', because the readers using the acquired information for different purposes. There are many ways and purposes of using the information. Users are not only readers they are developers of new information. The process of book selection has been changed to process of database selection. This facility provides effective contact between the database and its users. If a user interested in a piece of information, may not be available in the library, but by allowing the user to browse the database may find alternate information which satisfies his requirement.

5. Fourth law Save the time of the Reader

Here we must recall Dr. Ranganathan statement, that right information at right time to the right users.The emphasis was to save the time of the reader by adopting suitable measures and procedures, i.e location of library, open access, shelf arrangement, cataloguing etc. Presently the emphasis of saving the time of the reader increased in many fold. With the concept of databases, web based services, when we click a mouse of the computer we get the information in such a way that user get completely confused.

He may not be able to decide which web page fulfills his requirement. ' The web consists of contributions from anyone who wishes to contribute, and the quality of information or the value of knowledge is opaque, due to the lack of any kind of peer reviewing. Moreover the web is an unstructured and highly complex conglomerate of all types of information carriers produced by all kinds of people and search by all kinds of users. (Bjoneborn and Ingwersen, 2001).Here the role of librarians comes into picture. The librarian, library staff must collect and place the information in such a way that it saves the time of the readers/users. The format of the user requirement changed, but concept of save the time of the reader has not changed. Saving the time of the user means providing, thorough access to information resources. In order to save the time of the user, web sites need to effectively and efficiently design systems that will enable the users to find what they are looking for quickly and accurately, as well as to explore the vast amount of collection of information available that could potentially be useful.(Noruzi, 2004). Saving the time of the reader means providing efficient, thorough access to materials. Due to technological advancement it made possible to save the time of the reader/user, by providing the users right information at right time. 'One of the first big shifts in how libraries manage resources was the move from print-journal purchasing models to database-subscription and electronic-journal purchasing models. Libraries found this transition helped them scale their resources and provide better service just by thinking a bit differently about how they provided journals. Likewise, current cloud-computing initiatives allow technologists to think about how we handle our computing resources. Shifting to cloud solutions gives libraries an opportunity to save time and resources and also re-allocate resources to improve service'(Mitchell). The law can be better read as '**Save the time of the user**'.

6. Fifth law library is a growing organism

The emphasis of this law was planning and organizing libraries keeping in mind the future growth, may be in a library size, library catalogue, reader, and circulation of books, staff etc. Library takes in materials regularly and frequently. It assimilates what it needs, and discharges its waste. At present the concept of growing is not taken change, where as the format of the 'growth' has been changed. Presently most of the libraries are providing databases/web based services to the readers/users. Much of the progress achieved in providing library services. Computers, servers, printers, occupying most of the space of the library, apart from this within no time gadgets are getting outdated and must be replaced with the higher versions. Now documents replaced with the computer equipment.

Hence, growth is not in terms of documents, but growth in terms of equipment the law can be read as '**Information Centre is a growing organisation**'.

7. Conclusion

Dr. S.R. Ranganathan five laws have implications for organization, administration, and services in general. Whether one looks to Ranganathan original five laws of library science or to any one of the many new interpretations of them, one central idea is immediately clear; libraries and the information sources to serve people information needs. Most of the libraries are providing information in the form of databases, web based services. The collection of documents decreased, whereas the collection of electronic resources and equipment increased. The laws are essential but context has been changed. At present situation these laws better be suggested as:

- Information for Use
- Every information for his/her use
- Every information for its users
- Save the time of the User
- Information Centre is a growing organisation

The 'user is still in need of a better deal and library resources continue to remain under-utilised or un-used. Definitely the increasing use of technologies has made some difference or improvement to the information provision function. But the credit for that should go more to some other profession' (Jayarajan, 1992). User needs and characteristics can build tools to meet the information requirements. The five laws concisely represent the ideal source and organization.

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Study of the library and information centers in Higher Education Institutions in ICT age: *An analysis of selected university libraries in Jaipur, Rajasthan*

Vinay Singh Kashyap

Abstract

The present study furnishes an idea to refine resources and service set up of University Libraries in the modern context of ICT in Jaipur, Rajasthan. It also defines the major issues and challenges faced by the knowledge custodians. The study defines the major thrust areas of library and information centers which are to be taken care while reengineering the university libraries.

University Libraries, Information /Knowledge Resources, Information Services, Collection development, ICT

1. Introduction

Education aims at the exchange of knowledge, the inculcation of values and the imparting of vocational skills. The academic library as a place holds a unique position on campus. No other building can so symbolically and physically represent the academic heart of an institution. A university library is a part of a university set-up. Therefore, it exists to serve the objectives of its parent organization. It also aims at the advancement of the functions of its university. The library, which is still a combination of the past (print collections) and the present (new information technologies), must be viewed with a new perspective and understanding if it is to fulfill its potential in adding value to the advancement of the institution's academic mission and in moving with that institution into the future. Keeping in mind the above facts the current study was planned to know the organisational system, resources and services of the university libraries in Jaipur, Rajasthan.

2. Aim and Objectives of the Study

The principle aim and objective which prove utility of present investigations are as follows:

- To study the organisational system of University Libraries
- To delineate the limitations or problems, which seem to discourage the development of resources in ICT age
- To improve the organization and planning of efficient library services with available recourses in Libraries.
- To evaluate the real strengths and weaknesses of university library

3. Methodology

Rajasthan is the first largest state of India. Its western part is Thar Desert and Aravali mountain range bisects it into two parts. Its area is about 342,239 sq. km. with 33 districts (Figure 4.1). The present population is approximately 68,621,012. The literacy rate in 1951 was 8.95 percent, which rose to 67.06 per cent in 2010.

Rajasthan has a long history in Higher Education. At present there are fifty plus universities along with one central university. Some of them are recognized by UGC/AICTE/ICAR and other apex body. Seven universities are of specialized nature. Their collections, services, clientele, requirement are of a special type. They do not fall in the conventional / general university because impart education in the specialized field of

Agriculture, Engineering, Technology, Ayurveda, Law , Education, Sanskrit and Jainology, Journalism and Medical.These can be classified as below:

Table 1: Classification of University based on types in Rajasthan

Classification of Universities in Rajasthan	
Types	**Number**
Central University	01
State Universities	18
Deemed University	07
Private University	32
Total	**58**

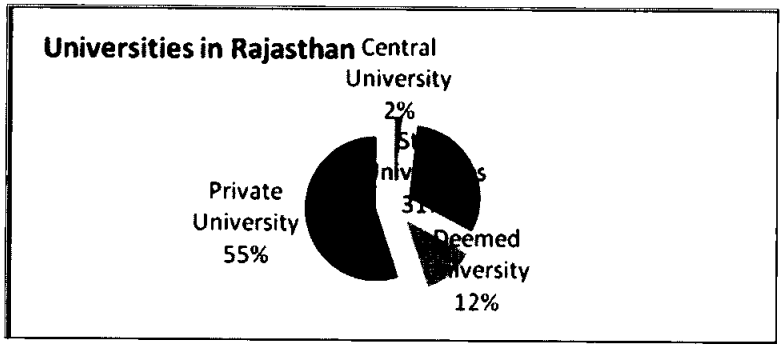


Figure 1: Classification of University based on types

The Figure1 represents the percentage of the universities in Rajasthan. The maximum 55% are private universities which have been established within last five years under the State Act for Private universities. Maximum 17 private universities exist in Jaipur. Table 2 is the classified list of university in Jaipur based on type and Table three is the alphabetical list of universities in Jaipur, Rajasthan.

Table 2: Classification of University based on types in Rajasthan

S.No.	Name	Type
1	Amity University	Private
2	Haridev Joshi University of Journalism and Mass Communication	State
3	Homeopathy University	State
4	IIS University	Deemed
5	Jagadguru Ramanand Acharya Sanskrit University	State
6	Jagannath University	Private
7	Jayoti Vidyapeeth Womens University	Private
8	JK Lakshmipat University	Private

9	JECRC University	Private
10	LNM Institute of Information Technology	Private
11	Mahatma Jyotirao Phule University	Private
12	Mahatma Gandhi University of Medical Sciences and Technology	Private
13	Maharaj Vinayak Global University	Private
14	Malviya National Institute of Technology	Deemed
15	Manipal University	Private
16	NIMS University	Private
17	Purnima University	Private
18	Pratap University	Private
19	Raffles University	Private
20	Rajasthan University of Health Sciences	State
21	Rajasthan University	State
22	Suresh Gyan Vihar University	Private
23	University of Engineering and Management	Private
24	University of Police, Crime and Criminology	State
25	Vivekanand Global University	Private

Table 3: Classification of University based on types in Rajasthan

Classification of Universities in Jaipur	
Types	**Number**
Central University	00
State Universities	06
Deemed University	02
Private University	17
Total	**25**

4. Organisational structure of University Libraries in Jaipur

The successful library building is one which clearly and directly expresses and provides for the functions that are performed within it. It should be well borne in mind that some of the general principles of planning which could serve as criteria in the light of which the building plans can be critically reviewed in the frequently changing technological environment. Below table gives the statues of library building in Universities in Jaipur.

Table 4: Statues of Library Building in Universities of Jaipur

Statues of Library	Number
Independent	3
Part of Administration Block	8
Part of Academic Block	10
Partially Independent	4
Total	**25**

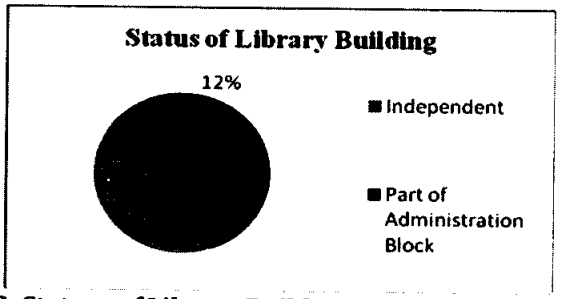


Figure 2: Statues of Library Building in Universities of Jaipur

The figure states that 40% libraries are the part of Academic Block; 32% are the part of Administration Block and only 12% are Independent Library building. Rest are Partially Independent, means the entrance and exit is apart from the main building of which they are the part.

In our spot study, we come to know that the process of ICT applications has been started in all the university libraries by making suitable changes in the existing buildings.

The below figure define the computerization of the Libraries. 30 % Libraries are still traditional and rests are Hybrid Libraries. The diagrammatic representation in Figure 3 presents the style of functioning in University libraries. It revealed that 30% libraries were traditional in their working style. Only 40% university libraries were fully-automated and 30% libraries are partially-automated. 20% libraries are rendering electronics services. As such, 70% library buildings are considered to be suitable for IT application. The use depends upon the working and opening hours of Library. The impact of ICT has made Libraries available 365X24X7. The e-resources and networking has ensured the users to get maximum information within time through their PC /Laptops and smart phones. The library can be carried anywhere and can be accessed any time with the ICT applications.

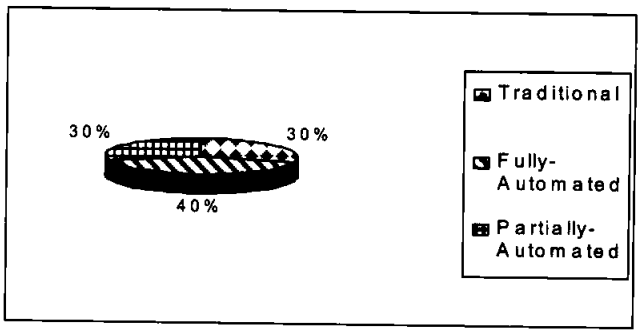


Figure 3: Style of Functioning in Library in Universities of Rajasthan

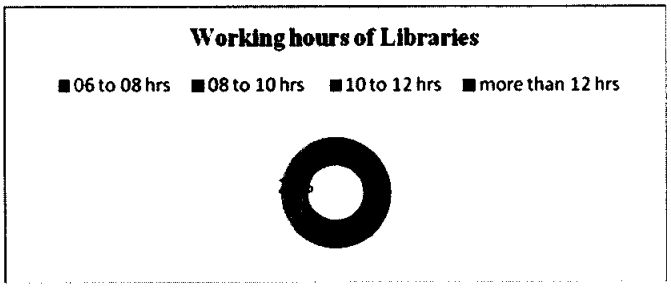


Figure 4: Working hours of Libraries

The Figure 3 represent the working hours of the university libraries. 44% university libraries offer their services for ten hours and 8% university Libraries work for more than 12 hrs.

The functioning efficiency of university library depends basically on the performance of their staff working there in. It is therefore, imperative that sufficient strengths of library staff should be available for rendering services to the clientele in the library- both professional and semi professional. The number of library personnel no doubt varies from library to library due to variation interest of university authorities regarding library services and availability of funds provided by university administration. The recommendation of Dr. Ranganathan Committee of 1957 for Staff Pattern has major impact on all the university libraries. The present statues of the staff is as below

Table 5: Statues of Library staff in ICT age

Number of Staff members	Number of University Libraries
>50	20
51- 100	4
< 100	1
Total	**25**

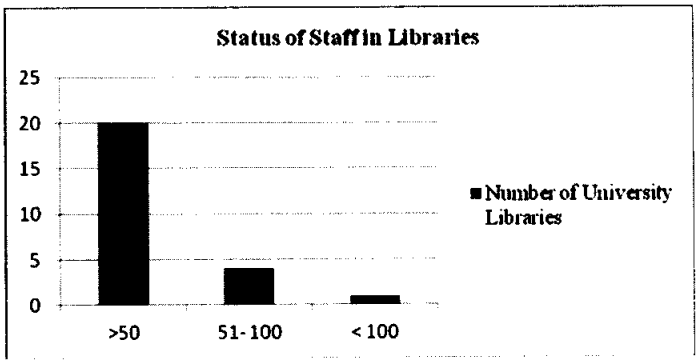


Figure 5: Graphical representation of Library Staff in ICT age.

The major effect of ICT on library personnel has been apparent in the form that lesser number with better quality is required to offer efficient services in university libraries. The above graph shows that maximum libraries have lesser number in Library staff due to Library Management software.

Resource development of a university library starts with the acquisition of different types of documents on different subjects of specialization which suit the programmes and necessities of the concerned institutions. Most of University Libraries have good collection of documentary sources, like books,

periodicals, reports, etc. Majority of University Libraries have book collection up to four lakh, titles and subscribe current journals up to seven hundred.

Table 6: Statues of Library Collection

Quantity in Lakh	No. of Universities Libraries
>1,00,000	19
1,00,001-2,00,000	1
2,00,001-300,000	2
3,00,001-above	3
Total	25

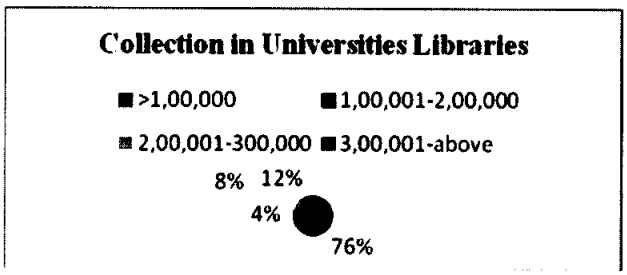


Figure 6: Collections in University Libraries

Above data show that only 4 percentages well established libraries poses more than three lakh books, periodicals, and journals in print as well as in non print version also. These are State University Libraries which have been established more than fifty years. Beside this 76% libraries have less than one lakh resources. These libraries are mainly newly established University Libraries either State or Private Universities and are in nascent stage.

The use of University Libraries may be increased by providing information regarding availability of different types of documentary sources to all the faculties, i.e., Science, Arts and Commerce, etc. This can be done by producing different types of information services.

Information is concerned with the users and the activities involved in the flow/ services from university library to the user. The objectives of information services are to fulfill needs, to satisfy wants and to create new desires. Therefore, information can be viewed as a process of exchange and a way to foster the partnership between the library and the user. No effort of information service will be effective unless we have knowledge or idea about the behavioural pattern of the potential user and also the idea of the composition of society. In view of all this the university libraries have to conduct surveys periodically, in order to understand the users requirement regarding information services, introduction of new information services, pricing services, place/channels of distribution of services, etc.

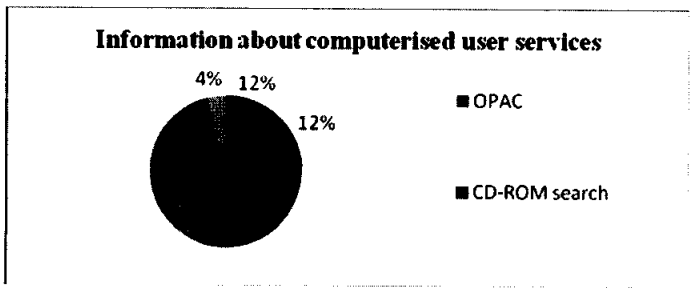


Figure 7: Information about computerised user services

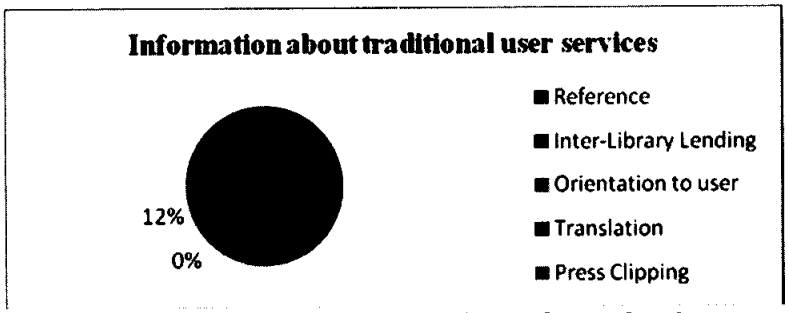


Figure 8: Information about Traditional User Services

Figure 7 and Figure8 state the percentage of libraries providing the ICT based services and traditional services in the Universities of Jaipur. No University is providing translation services to users, though maximum information/literature is published in foreign languages. With a comparison to computerised services still tradition services are given to the users, it has been observed that most of the university libraries have not conducted any survey to ascertain the demand/needs of users for information services which is one of the important aspects of information services.

In recent days the need of users cannot be satisfied until all the libraries join together to share their resources with each other. Resource Sharing, Networking of Libraries and use of Internet/ Intranet Services are enabling the libraries to provide maximum services and resources to their users.

It has been observed that most of the libraries have traditional, as well as, e-resources in their libraries. Universities in Rajasthan are interconnected through network with each other. The network provides the facilities to access database of all the member libraries. Maximum university libraries in Jaipur are member of DELNET and the State Universities are availing the facilities from UGC-Infonet and INDEST-Consortia (as per rules of UGC) for resource sharing.
Maximum Universities are having good number of computer systems in the libraries along with multimedia facilities. All the state Universities having an internet Center apart from the Libraries. The Private Universities have rich ICT facilities and provide maximum user based services with available Information Resources.

5. Conclusion

As defined above the work of library can be grouped into few operations and products: acquisition of books, periodicals, reports and non-book materials, etc., technical processing of reading materials like classification, indexing, abstracting, etc. compilation of bibliographies, directories, etc. creation of local information database, on-line access to national and international databases, use of external databases on local computers, circulation of documents control, communication and networking. On the whole, this study has examined the existing position and situation of Infrastructural facilities, information services/ activities in ICT environment, in respect of UGC, ICAR, AICTE, HRD, NAAC, etc., in details and reveals the following facts as:

- 24 hours access to computer laboratories,
- physical isolation of specific areas to allow hours of access, e.g., open reserve collection and adjacent computer, photocopying and study facilities,
- flexible learning spaces equipped with network access including multimedia resources and applications software such as word processing, specialist assistance close at hand,
- production facilities for use by clients to develop their own audio-visual and multimedia resources in a variety of formats,
- video-conferencing facilities for client use,
- facilities to support client participation in networked on-line discussion groups,

- laptop docking facilities, wireless laptops availability,
- specialized facilities for researchers such as fully-equipped work-stations supporting information access and retrieval with full word-processing and printing facilities adjacent to specialist assistance from reference librarians,
- special study domain for postgraduate students,
- open-access compacts shelving,
- provision of adjacent refreshment facilities such as open reserve,
- tele-conferencing facilities for administrative purpose,
- co-location of service desks for increased staffing,
- increased physical integration with related units in the organizational structure such as information technology, student support and teaching and learning.

The basic and fundamentals of librarianship are to provide right information to right user at the right time. These are not going to be changed, in the environment of digital libraries. Inspite of the various barriers in the skill development, the LIS professionals will acquire the timely skills and continue to be reliable source for the information seekers. The skills are to be developed by LIS to use e-mail effectively, to use telecommunication means economically, to use the network with fair idea of accessibility of various information sources, the skills to compile directories of information sources, services and to prepare lists of various resources.

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Surviving and Thriving of Translation Service and Role of Modern Library

Sabita Kundu



In present epoch, library professional need to adopt themselves according to the latest innovations. The massive growth of social network, Open Access Sources, and Directory of Open Access Journal (DOAJ) help librarian to provide information at right user at the right time. English is only medium for most of the open access repositories, journals and article of journals. And it is not unescapable language to every field of knowledge, especially in research work. Every moment open a new possibility in different site. Renowned organizations, institutions and social organization play a vital role for translation work all over the world on payment or free of cost since; translation is only media providing a fresh view on consistency.A quality and upright translation revive a new self-possession. As a library expert the service encounter is an opportunity to build perceptions of quality and satisfaction of translation. So it is important to manage the evidence of service in each and every encounter for disseminated information. He / She enhance research efforts through searches, accurate translations; automatic updates, timely deliver electronic and printed document, and expert resources assistance have been developed.



Networks, Language, Translation, quality and satisfaction, disseminate information

1. Introduction

"Change now and choose our future" –said Carla Stoffel. Speedily restoration of technology opened new ways of learning. In the framework of learning, an academic institute depends on library. Academic and research related works are disseminated through library. The traditional library was converted to modern library.In present era, a library professional need to adopt themselves according to the latest innovations. Library professionals can provide services in online mode and by this libraries can become more user-friendly. This makes library professionals capable enough to provide real-time services. Social Networking Sites or SNS and Open Access Journal have given us means of providing real-time services. Resent years have brought a massive growth in the social networking phenomenon and Directory of Open Access Repositories (DOAR) and Directory of Open Access Journal (DOAJ). These have become so much popular that ever-increasing numbers of people consider using it through internet. The research works in every field of Knowledge (0-9) and in every sub fields of new subject have flared up due to reason.

2. Open Access- 1996-2000 and 2006-2010

As per survey result of"Directory of Open Access Repositories in Library and Information Science: a Survey" by Jinu S Rajan and DrVijayakumar K.P of University of University of Kerala, Thiruvananthapuram, the data regarding open access repositories and journal data collected from open source systems for Libraries and the website of NISSAT workshop on free source software for Library and information Management, it is seen that majority of open access journals are published from United States; the most productive periods are 1996-2000 and 2006-2010. More open access journals are published in English Language. Analysis of open access repositories revealed that more storehouses are in English language (67.03%). A compilation of free software for libraries is also attempted in the paper. Perl is found to be the commonly used language. A good number of repositories contain articles, conferences and theses. DSpace software is used to create 39.56% of the storehouse. **(J.2013)**

1.1. **Open access Journals:** As per Directory of Open Access Journal (DOAJ); An Evaluation of Open Access Journals in Library and Information Science as listed DOAJ by Dr. Sarala K.R. Librarian Sarabhai Institute of Science & Technology, Vellanad evaluates the various characteristics of 135 OA journals. The results demonstrate that English is the main language of Publication in 48% of journals. Ninety one journals are found to be published after 2000. United States has published 28% of OA journals. Over 93% of journals

levy no article processing charge. Nearly 10% of journals follow the most restrictive CC-By-NC license. **(S.2013)**

1.2. **Open source software:** Open Source Software is licensed to guarantee free access to the source code. This allows the user to install the software on a new platform without an additional purchase and to get support for a product whose creators no longer support it. Those who are technically inclined can fix bugs themselves rather than waiting for someone else to do it; like Greenstone.

- **Greenstone**

Greenstone is a suite of software for building and distributing digital library collections. It provides a new way of organizing information and publishing it on the Internet or on CD-ROM. It is produced by the New Zealand Digital Library Project at the University of Waikato, and developed and distributed in cooperation with UNESCO and the Human Info NGO. It is open-source, multilingual software, issued under the terms of the GNU General Public License. The complete Greenstone interfaces, and all documentation, are available in *English, French, Spanish, Russian and Kazakh.*Greenstone also has interfaces in many other languages. **(V.2013)**

3. No of Journal published Languages wise

Most Open Access Journals are published in English Language. Altogether 127 journals are published all over world (as per research report on published paper in DOAJ on the basis of language) (M. 2013)

Figure 1 - Graphical representation of Chronological arrangement of journal as per used Language

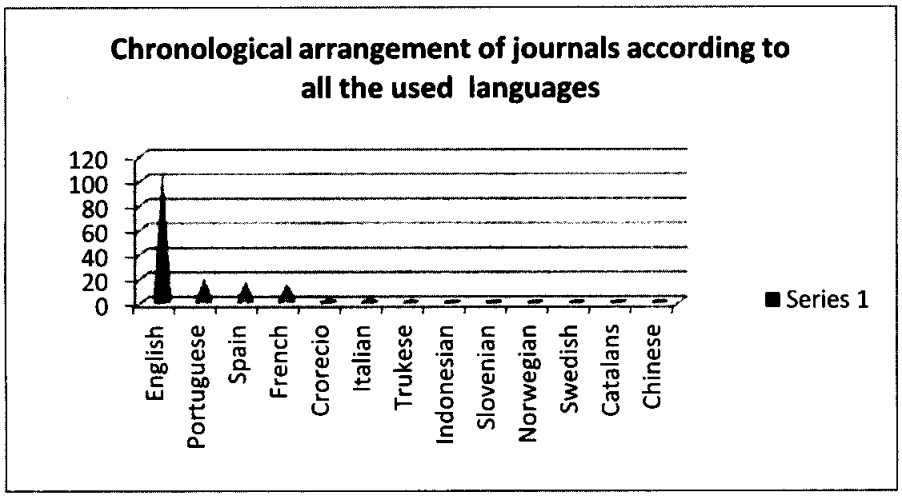


Figure 1, is chronologically representing the language are use as medium for published journals. These are – 112 journals are in English, 21 in Portuguese, 18 in Spain, 16 in French, 3 in Coercion and Italian language, 2 in Trukese language and I in each Slovenian, Indonesian, Norwegian, Swedish, Catalans, and Chinese. (M. 2013)

Figure – 2 Chronological arrangement of journal as per one Language

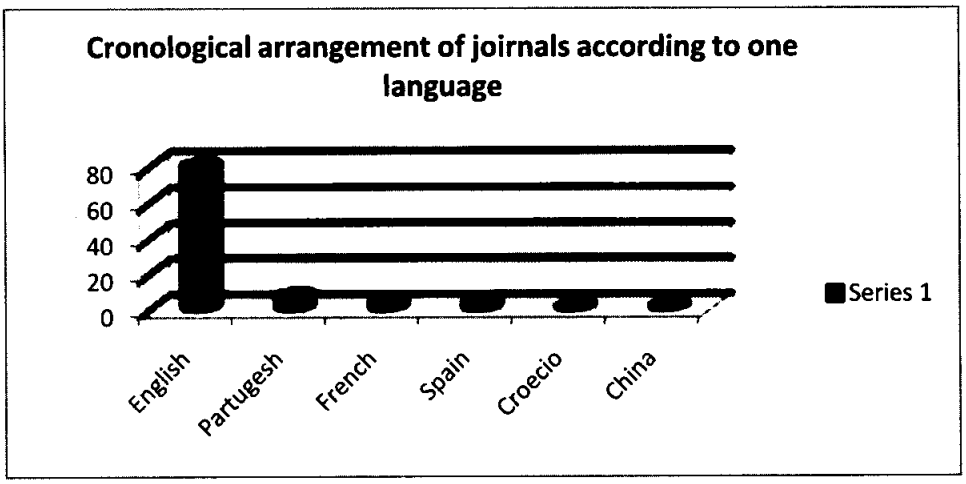
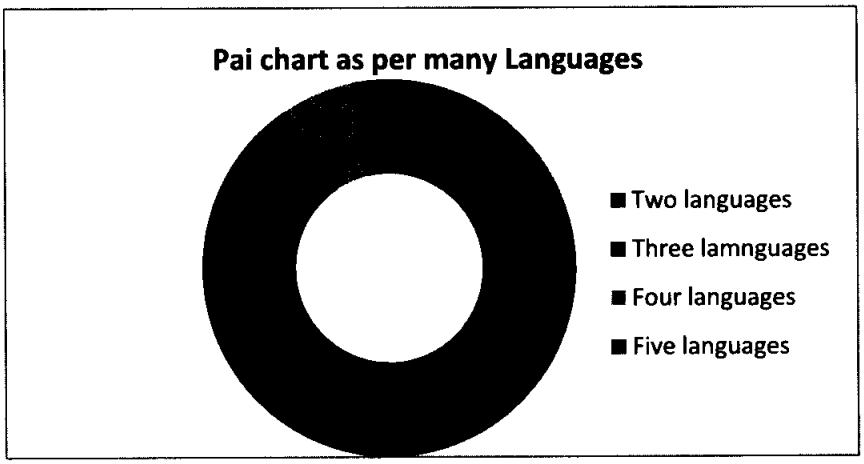


Figure 2, is show chronologically representing the one language use as medium for published journals. English is foremost language; within 95 Languages 80 journals are existent in English, 7 in Portuguese, 3 in Spein and French, 1 in Croecio and Chaina 1.(M 2013)

Figure – 3 Chronological arrangement of journal as per many Language



More than one language is used in one journal as medium of publication. Figure 3 shows, 32 journals are listed in this context of more than one language. 16 journals are use two languages, 13 journals use three language, 2 journals used four and 1 journal used five languages **(M. 2013)**

As a medium in exchange of knowledge the English is used everywhere in developed countries. Internet and open source play a vital role for interchanging the Knowledge and disseminating result of research. Translations are required in these circumstances through translation everybody can exchange knowledge and reach distinguishable goal.

4. Organizations provide translated work

All over world renowned organizations deliver translated work. The organizations are profitable and Non-profitable, International, National, Regional, Indigenous organizations engaged in translation

delivery. There is a great interest in providing translation service, which can be cost-prohibitive or free of charge. These are:

- American Translators Association (ATA)
- Association Suisse des Traducteurs, Terminologues et Interprètes (ASTTI),
- British Library,
- Conseil des traducteurs et interprètes du Canada (CTIC),
- Canada's national association for translators and interpreters,
- Fédérationinternationale des traducteurs (FIT),
- Free French Language Newsletter! Sign Up,
- Information about legal translation/interpretation and a database of freelancers,
- International Association of Conference Interpreters (AIIC),
- Japanese Translation -Tokyo-based Translation Agencywww.arc-japanese-translation.com,
- The Kenyan organization Bible Translation & Literacy Chambers belge des traducteurs, interprètesetphilologues (CBTIP-BKVTF). Defends the rights and interests of translators, interpreters, and philologists,
- Multi Ling - Official Site - Translators w/ Advanced Scientific,
- National Association of Judiciary Interpreters and Translators (NAJIT),
- NISCAIR, New Delhi for translation on advance payment basis,
- Northwest Translators and Interpreters Society (NOTIS).
- A place for translators and those who need translators to exchange ideas,
- Reforma Colorado's New Translation Service,
- Sociétéfrançaise des traducteurs (SFT)Non-profit organization representing the rights of translators,
- Translation ServicesCertified, sworn Translation from professional Translators,
- The umbrella organization, representing 60,000 translators around the world, ect. (https://www.google.co.in)

All agencies do not deliver the translated document directly but direct the user to professional translators.Some agencies arrange to serve translated document against payment. More or less Professional organizations are involved with various benefits for translators and interpreters.

- **NISCAIR:** NISCAIR provides translation of S&T documents from 20 foreign languages into English as per charge. The languages include Chinese, Czech, Danish, Dutch, French, German, Hungarian, Italian, Japanese, Norwegian, Polish, Portuguese, Rumanian, Russian, Serbo-Croatian, Spanish, Swedish, etc. The clients include National Laboratories, S&T institutes, R&D organizations, Corporate and Public Sector Undertakings, Universities, Research Scholars etc. Technical literatures in foreign languages for translations into English received from directorate are sent to respective language department. NISCAIR provides reverse translation (English into foreign language) also. Translation of English text of maximum of one page into French, German, Russian and Spanish is undertaken. Translation of full English documents into French, German, and Russian and in other languages. Translation of Japanese is undertaken. NISCAIR also undertakes interpretation and consultancy assignments in Japanese language. ***(www.niscair.res.in)***

- **British Library:** British Library provides translation for registered customers and Non-registered customers, as per institutional norms. (https://www.google.co.in)

- **Others or self-organization:** Professional organizations, Multi Ling - Official Site, professional translators are involved. Google translate is provider's free online translation. "Translation Service online estimate" - serve translated document in over 1600 language combinations and has been intelligently putting 39286 customers in contact. Language **translation service** instantly translates text and web pages. **Simple Direct Media Layer** (SDL) is the world's number one provider of free and professional language **translation services** for web sites and documents. **(https://www.google.co.in)**

In Open Access journal various languages are used. This develops the Open Access knowledge movement and pinpoint destination to the readers and is very important for society.

5. Translation Needs of Modern Society

The modern society has various needs. The most important need is education, which enables to nourish knowledgeable and responsible citizens. There are some finer needs like spiritual, ideological, cultural and aesthetic that refines the society. The society depends on technological developments; brought about by research scholars. It is providing sufficient necessary information.

- **Bible in translation:** Translation is one of the most powerful medium. It's means of providing a fresh view on oneness. The rise of new critics, the development of communication theory, and the application of linguistics to the study of translation- all started flourishing, from which the recent transformation theory has been able to proceed. The original matter must be recreated and yet remain recognizable.

An example of translation in religion all over world the Tanakh was mainly written in Biblical Hebrew, this "Hebrew Bible" is much older. The Bible has been translated from the 9th century to the 15th century. The Bible has been translated into many languages from the biblical languages of Hebrew, Aramaic and Greek. As of November 2012 the full Bible has been translated into 518 languages, and 2,798 languages have at least some portion of the Bible. The New World Translation, produced by the Watch Tower Society, is currently (according to p. 4 of the 2013 Revision) produced in over 121 languages and more than 201,324,734 copies have been printed **(http://en.wikipedia.org/wiki/Bible_translations access: 19/12/2013).** The example of bible is mentioned not as holy religious book, it is important for required the translation work more or less in every field of knowledge especially in the field of science and research.

- **Translation needs for Scientist and researcher:** Carla Stoffel said "... drive libraries – especially large research libraries to make organizational, structural and cultural changed to maintain their roles as vital contributors to teaching and learning in their institution". In this present world, where everything is reduced to science and technology, there is a desire to become familiar with the scientific literature in other language. In addition to this desire to learn in one's mother tongue is also increasing considerably. In such a situation, the Government and the Universities undertake the work of translating the scientific text at a greater speed and in a considerable manner.
- **Translation needs for researcher:** Scientists have very little time to acquire proficiency in so many languages; moreover linguistic skills are not a universal faculty. Cover-to-cover translations are very expensive and time consuming. In the 20th century, the trend towards increase in number and specialization of indexing and abstracting services continued. Indexing and abstracting services, apart from performing these useful functions, also facilitate retrospective searches for their main document, selection of documents for further study, selection of documents for translation. Moreover every research organization has its own specific need for translation to bridge its information gap. If a research organization has a sizable and steady demand for translation, it is desirable to have translation unit of its own. Such a translation unit will be able to help the research workers most effectively by providing them with the required translations expeditiously. Sometimes it may not be necessary to get the complete document translated; deciphering the charts graphs, tables etc. **(G. 1983)**

A place for translators and those who need translators to exchange ideas, Non-profit organization representing the rights of translators are involved to serve translation.

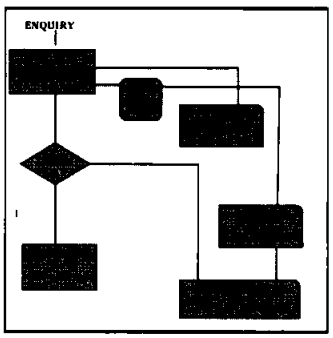
6. Role of Library Professionals

Since a large number of libraries provided translation service in order to satisfy their clients in much more sophisticated systems, which allow libraries workforces to show search result to users. Optimize research efforts through searches, accurate translations, automatic updates, timely electronic and printed document delivery, and expert resources assistance have been developed. Today almost every library tends to opt T/S material one of the first services to go online was the Electronic Access to translation/ Reference service (EAT/RS), launched by the university of Maryland Health Services Library in Baltimore in 1984. Three years later, the libraries at Indiana University developed an e-mail system called LIRN (Libraries Information and Reference Network,) which was menu-driven and part of a network system (**as cited in Yost 2004**).

- **Service quality and service productivity:** In 2006, Christopher Lovelock and Jochen Wirtz explained described the relationship between service quality and service productivities - a key challenge for any service business is to deliver satisfactory outcomes to its clientele in ways that are cost effective for the company. If customers / user are disappointed with the quality of a product or service, they won't be willing to pay very much for it or even to buy it at all. Low sales volumes and/ or low prices mean less productive assets; according to Valarie A Zeithaml, Mary Jo Bitner, Dwayne D Gremler and Ajay Pandit (2008) Customers expect different types of service an anticipation: (1) desired service, which reflects the customers want; (2) adequate service, what customers are willing to accept; and (3) predicted service, what customers believe they are likely to get, regarding service quality, the customer's perception of the service quality.
- **Critical determination:** The customer's perception of the service component of a product, is a critical determinant of customer satisfaction. In case of a pure service, service quality may be the most critical determinant of satisfaction. They mentioned the service encounter or "moments of truth" as the building blocks for both satisfaction and quality. Service encounter is an opportunity to build perceptions of quality and satisfaction. So it is important to manage the evidence of service in each and every encounter; Harsh V. Verma (2009) also confirmed that in service, quality is not objective, rather it is perceived. Quality in services is based on customer's judgment of superiority on intangible dimension. He describes a framework which views quality in services as much as made up of two dimensions of technical and fictional quality. Technical quality refers to the outcome while functional or process quality refers to the quality process through which the outcomes are transferred to the customer; in 1985 however listed ten determinants of service quality, which were further, regroup into five dimensions: reliability, responsiveness, tangible, assurance and empathy in the process of evaluation of customer satisfaction. **(S. 2012)**

7. Value added vs Non-value added translated work

Testing or practice is not Value added work. Customer pay for product here product is translation as per requirement of user. By a flow chart demonstrations how delivered the service and how it is rearrange for service.



Flowchart of work, Development and sale

Academic Research library can employ several approaches to advance the institutional mission. First library can shift from goals focused on collection and traditional library service and instead align with their campus academic plan and can emphasis and support institution's strategies initiatives. A second approach is for libraries to modify their organizational structure, (e.g. public service, technical service, collection development) and moved instead toward organizational units that support their universities missions (e.g. undergraduate education, graduate and professional education; research, scholarship, creative activities; and public engagement). The key is to have library staff engaged in work that contributes vital institutional outcome such as student success and faculty research productivity. Academician demonstrates the value of academic research library in providing academic quality service that advanced institutional mission.

8. Conclusion

"Without continual growth and progress, such words as improvement, achievement success have no meaning" (Benjamin Franklin). Improving and Standards doing works achieving something that seems difficult at the face of it and success in short term goal they are all evidence that one is growing. It is very important to improve upon the methods and processes with time to peace with the trends and technology of the changing time. It is also essential to pursue and accomplice short terms goals in order to achieve long term objective. Success brings satisfaction and from this satisfaction, a profound zeal to do better takes birth. In the surviving and thriving of translation service has researched and introduced methods and has followed the process which have helped in standardization of various task related to thriving surviving the bars of quality and making the tasks easier for the team at the same time.

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Determining the Taxonomy of Common Physician's Clinical Questions in Outpatient Services to Patients and their Satisfaction Score of Tele-Clinical Librarian's Responses to Clinical Questions in Rural and Underserved areas of Iran

Azadeh Aletaha *et. al*



The main aim of this study is to determine the role of Tele-Clinical librarian services rendered in health centers in underserved and rural areas in Iran and to decide what a logical classification of clinical questions is. An exploratory survey was conducted using a questionnaire with 9 questions completed by general practitioners to evaluate the clinical librarians' performance. Twenty General Practitioners from a group of ninety physicians were selected using a simple random sampling method. 117 clinical questions were asked within 4 months. The answer to each question was scored on Likert scale. Simple descriptive statistical analysis was utilized using SPSS software version 18. Finally, the clinicians assessed each clinical question in terms of accuracy and up-to-date and made a taxonomy of common clinical questions.



Clinical librarian, Health system, clinical question, Evidence-based medicine, Taxonomy

1. Introduction

As clinical librarians and knowledge experts in the explosion of information era, we know that receiving high-quality answers as quickly as possible is a priority for our physicians. The growth of medical information resources and the internet on one hand, using the most advanced communication technology in information retrieval and storage systems on the other hand, causes new challenges for physicians to address many questions during patient care.

The clinical librarians have diverse roles in different institutions, but the common theme to any clinical librarian is provision of valid and accurate information at the point -of -need and at the point -of -care. They act as an expert in making perceptive judgments about the issues surrounding a specific topic and in addressing needs of the healthcare teams· As Davidoff and Florance assert "The inherent limitation is that the physicians don't have enough time to look for the answers to most of their clinical questions themselves. Studies indicate that physicians often encounter multiple questions during daily practice. If physicians couldn't receive immediate and appropriate response to their clinical questions at the point -of -care; the serious and irreparable flaws would be created in many aspects of diagnosis and treatment of health care process.

As the amount of medical knowledge doubles every year, general practitioners encounter a constant stream of updates about clinical medicine and practice management in underserved and rural areas with limited access to the medical information on the internet and also the low-speed internet connection. How can they keep up-to-date, and how can they recall that pertinent fact when they need it? We developed Tele-Clinical Librarian service in underserved and rural areas. These services save the physicians' time, and would provide them with useful and timely information. They possess expertise to navigate various search resources to select the best evidence and judge the quality and relevance of the information from different resources to help answer clinical queries of GPs and deliver highly targeted evidence in support of patient care.

No remarkably similar study has been attempted, partial to other literature about clinical librarian's position ,we report the complete research of proving Tele-Clinical Librarian role in meeting Clinical needs of health care practitioners for the best care and treatment in underserved and rural areas ,which illustrates the remarkable position of clinical librarian projects in Iran, Physician's satisfaction scores of clinical librarian performance, clinician's scores to the degree of update and accuracy of responses to clinical questions and building a taxonomy of common general practitioners' clinical questions.

2. Research Methodology

This paper discusses the issues in developing Tele-Clinical Librarian. The project was undertaken by 4 expertise clinical librarians to answer clinical questions of General Practitioners worked in underserved and rural areas within a 4-month period from 1 October 2012 to 30 January2012 in Iran-Kerman.

3. Design requirements and selecting General Practitioners

We applied a list of physicians working in underserved and rural areas from health centers in Iran-Kerman. The main requirements for Tele-Clinical librarian service included the agreement of General Practitioners and their collaborations. The list given us consisted of 90 physicians. We called all of them and invited them to participate in the study and we also sent an invitation form to their emails in which we explained more about all phases of the project. After this phase we excluded those names that were unwilling to collaborate in the project. Finally 20 physicians were assigned from the list to collaborate in the project but 3 physicians couldn't cooperate with us so, three other new general physicians were replaced who were willing to collaborate with us.

Five main areas were selected which included underserved and rural areas (Medically Underserved Area (MUA) or medically Underserved Population. Identified areas or populations were all suffering from the lack of health care services. Documentation of shortages consisted of several factors, including the availability of health care providers).This study was conducted in Kerman city which is located in Iran. Tele-Clinical librarians began to contribute to patient care and have consultation with each physician in specific time from 8AM to 3PM during the week from Saturday to Thursday to provide information relevant to the physician's needs.

General practitioners have the final responsibility to determine their satisfaction scores of clinical librarian performance. After each consultation, a short questionnaire with 9 items was sent to the GPs. the GPs had the opportunity to fill out them about the results of the evidence-based answering service (the questionnaire had been evaluated by two experts in epidemiology, seeking the validity of the survey).

Finally, clinicians assessed each clinical question in terms of accuracy and up-to-date and gave the score in Lickert scale. All clinicians were chosen from different fields of medicine which consisted of Psychology Gynecology, Pediatrics and Pharmacy. To measure and evaluate the questions and answers, we classified two areas; the first classification consisted of drug questions and non-drug questions and the second classifications consisted of different medical categories. Lastly we made taxonomy about what are the most common clinical questions raised by GPs from clinical librarian in different medical issues.

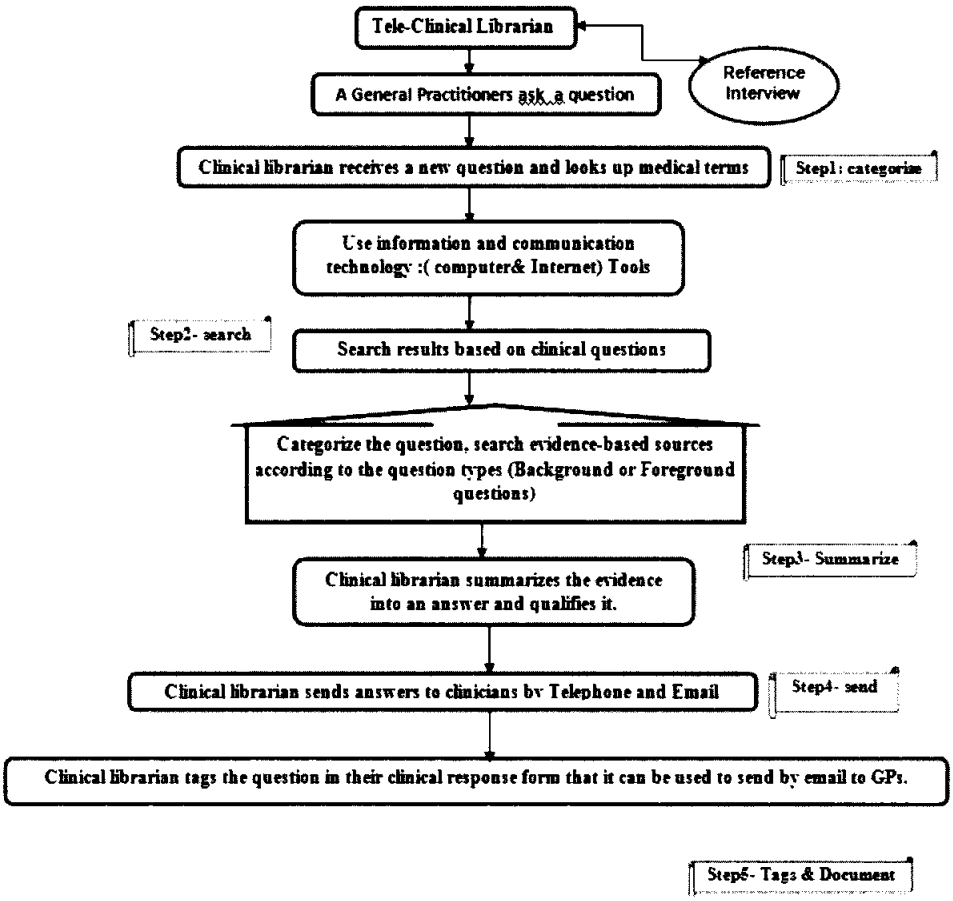


Figure - 1 Tele-Clinical Librarian process in running this project

4. Result

The result of the study shows the taxonomy of common physician's clinical questions in outpatient services to patients and their satisfaction score of Tele- Clinical librarian's responses to clinical questions in rural and underserved areas of Iran-Kerman and the clinicians' scores of accuracy and update responses to each clinical question.

The two most clinical questions are classified in two categories, the first category is drug information (108, 92%) and the second category is non-drug information (9, 7.70%).It shows that most of the questions included drug information (Table1).

Table1- The classification of clinical questions

	Frequency	Percent Frequency
Drug Questions	108	92.3
Non-drug Questions	9	7.70
Total	117	100

16 medical areas were categorized from 117 clinical questions. We found that three most frequent medical subjects ranked from first to third level. In whole, more questions have been asked in three categories and large amount of clinical questions were in Pediatrics, Gynecological disease and Psychiatry. Other medical subjects are assigned different ranks (Table2)

Table2. The frequency distribution of medical issues

Medical Subject	Rank
Pediatrics	21
Gynecology	17
Psychiatry	13
Internal Medicine	10
Neurology	6
Pharmacology	12
Public	4
Dermatology	3
Aids	3
Diabetics	2
Infectious Disease	3
Urology	5
Malaria	2
Oral	3
Oncology	6
addiction	3
Total	117

Eighty-two percent of clinicians responded to the accuracy of clinical librarians' answers to each clinical question. The majority of these clinicians were from different fields of Psychology, Gynecology, Pediatrics and Pharmacy. They indicated that the Tele-Clinical librarian service had a positive effect to answer clinical questions in their daily practice and gave accurate answers to each clinical question. 11.9% of the questions were not well considered and have errors in delivering accurate answers (Table3).

Table3-The accuracy clinical librarian' responses to clinical questions

Lickert scale	Data estimation	Frequency	Frequency percent
1	Very bad	10	8.5
2	Bad	4	3.4
3	Medium	6	5.1
4	Well	15	12.8
5	excellent	82	70.08
Total score		117	100

87.5 % of clinicians gave a score which was used for analysis purposes to the degree of updated clinical librarian's response to the clinical questions. It was used to investigate if the clinical librarians have an important role to deliver up-to-date information. 15.3% of responses were not well considered (Table4).

Table4-The degree of up date clinical librarian's response to clinical questions

Lickert scale	Data estimation	Frequency	Frequency percent
1	Very bad	7	5.9
2	Bad	11	9.4
3	Medium	7	5.9
4	Well	12	10.25
5	excellent	80	68.3
Total score		117	100

One hundred questionnaires with 9 questions in different areas assessing the General Practitioners' scores to clinical librarian performance indicated a positive and practical role of Tele-Clinical librarians and information science in the clinical health care system.

The majority of General Practitioners completely agreed with these comments that were expressed. The satisfaction of the responses provided by clinical librarian was evaluated on the LIKERT scale.

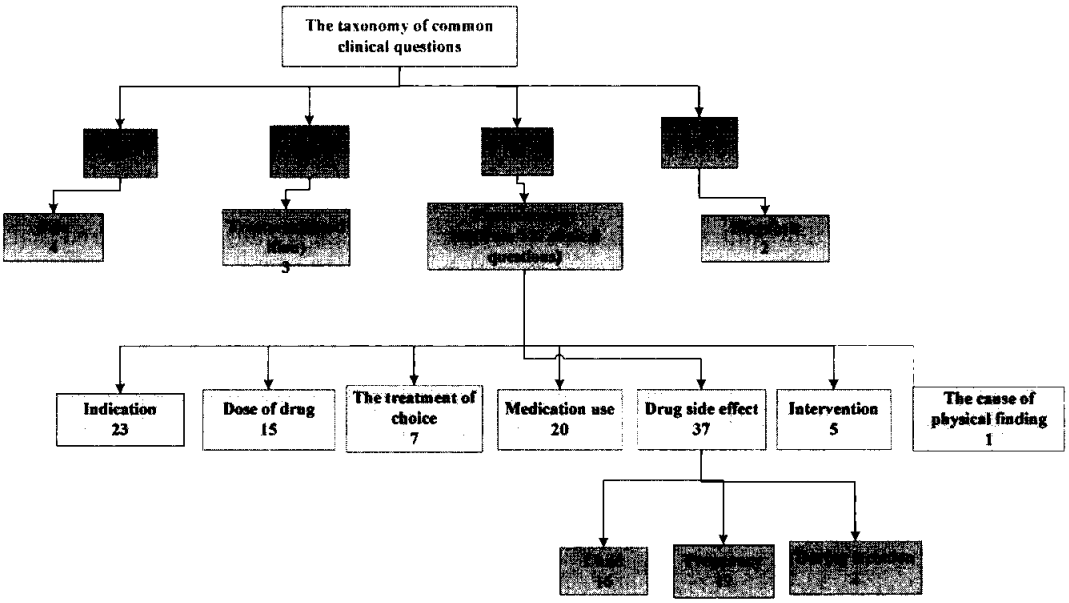
One hundred percent of GPs was totally agreed with understanding and analyzing clinical questions and sixty percent of GPs agreed to accurate, up to date, valid and evidence-based medicine answers to each clinical question. Sixty percent of General Practitioners' responses were helpful to make decisions in solving health care problems. While, regarding the possible reduction of medical errors in the health care system, 90% of General practitioners agreed and 65% of them insisted on enhancing the quality of treatment and timely diagnosis of disease. Although, determining the time required to answer clinical questions was not considered in this study, but approximately 10 minutes were allocated to the response procedures. One hundred percent of General Practitioners declared that clinical librarians have a positive and beneficial role in decreasing the knowledge gap by providing evidence-based answers at point of care.

Table5- Frequency of distribution General Practitioners' scores to clinical librarian performance

	Area Assessment											
	Understanding and analyzing clinical questions		accurate, up to date, valid and evidence-based medicine answers		Make decisions to solve health care problems		Possible reduction of medical errors in health care system		enhance quality of treatment and timely diagnosis of disease		Decreasing the knowledge gap	
Likert Scale	frequency	% Frequency	frequency	% Frequency	frequency	% Frequency	frequency	% Frequency	frequency	% Frequency	frequency	% Frequency
Strongly disagree	0	0	0	0	0	0	0	0	0	0	0	0
Disagree	0	0	3	15	5	25	0	0	0	0	0	0
Neither	0	0	5	25	3	15	2	10	7	35	1	5
Agree	15	75	12	60	12	60	18	90	13	65	14	70
Strongly agree	5	25	0	0	0	0	0	0	0	0	5	25
Total score	20	100	20	100	20	100	20	100	20	100	20	100

We categorize all 117 clinical questions. Apart from four questions in foreground category, most of them were classified as background questions which included generic questions. The generic questions were categorized in four levels consisted of A(diagnosis questions: 2,1.7%) , B (pharmacology : 108,92.3%),C(Treatmentcondition:3.2.5%), D(Pico: 4,3.4%).The second level(B) consisted of seven broad areas: indication(23,21.2%), dose of drug(15,13.8%),the treatment of choice (7,6.4%) , medication use(20,18.5%), drug side effect(37,34.2%),intervention(5,4.6%), and the cause of physical finding(1,0.9%). A branching structure of A, B and C levels further characterized the generic questions. On average, most of questions were classified in the field of pharmacology with 108 questions.

Figure2- The taxonomy of general questions asked General Practitioners in primary care



5. Discussion

- **Main findings**

In this study, we modified taxonomy of generic clinical questions, the performance of Tele-Clinical librarian and the degree of the clinicians' score to the accuracy and up to date answers delivered by clinical librarians in underserved and rural areas. We found that a large number of questions could be categorized as generic types in background classification.

This paper revealed that clinical librarian can assist general practitioners working in rural and underserved areas through information and communication technologies. They used a question and answering process in retrieving evidence-based information to consult GPs in rural and underserved areas during the week. Physicians were satisfied with the performance of clinical librarians as having a positive impact on patients care.

This study presents 117 clinical questions in two categories (drug questions:108 and non-drug questions:9) posed by the General Practitioners in various sets of medical issues pediatrics(21 questions), genecology(17 questions), psychiatry(13 questions), pharmacology(12 questions) and internal medicine(10questions) and in drug side effect categorized in three classifications of child(16), pregnancy(19), during lactation(2). It reveals that most of questions included pregnancy and child questions in drug side effect classification and all of them included medication type. Nevertheless most of the questions were classified in medication type. Therefore, clinical librarians should greatly improve their medical information knowledge in the areas of Diagnosis of disease, new treatment tools, Pediatrics, Gynecology and Psychiatry. Furthermore, the most clinical librarian' needs are in the field of clinical pharmacology, pathology (diagnosis of disease), general medicine and medical terminology. These topics should be included to the education curriculum of medical library and information science field in MS and PHD levels.

According to table3 and 4, the analysis identified that 78% of clinicians have been agreed with up-to-date responses.15.3% of responses were not considered good and were not well satisfied to meet the needs of General Practitioners. 82% percent of clinicians' agreed with the accuracy of information and 11.9% of the questions were with errors for accurate responses. This could be due to not well-designed by physicians and also physician's unfamiliarity with the topic of evidence-based medicine. So clinical librarians ought to be

involved in acquisition of new skills and tools to present up-to-date and accurate responses to clinical questions.

Another reason for this error percentage could be inadequate dominance of clinical librarians in evidence-based-medicine, medical terminology and pathology areas. So, clinical librarians should learn new skills and improve their capabilities and should also be specialized in evidence-based-medicine. Medical Education in the field of evidence-based medicine is more significant for General Practitioners. If clinical questions be well organized by physicians and use Pico forms to design their clinical questions and also if clinical librarians have the knowledge base in evidence-base medicine, they can help physicians to answer their clinical questions in the daily practice in the shortest time. This point should be considered that the final treatment will have done by physicians and clinical librarian has a supplementary role in professional health care teams as an assistant and a cooperator with physicians in daily practice and evidence-based-practice to provide valid and reliable information especially in underserved and rural area. Strauss and his colleagues have pointed out that for every inpatient, over 5 questions for every 2 outpatient, 3 clinical questions were raised for the physician23. The importance of answering GPs' clinical questions was highlighted in this study, with modifying taxonomy of general questions that included background questions in different classification of drugs, medication, adverse effect of drugs, Genecology, Pediatrics, Psychiatry, intervention of drugs, diseases equalize and specific set of conditions, it was possible to provide a targeted answers and also 92.3% of most common questions are classified in medication type.

In many cases, however, physicians don't find enough time to raise their questions due to the high number of outpatients; so many questions may never be answered. It allows clinical librarians a longer time to formulate a response to provide evidence based medical information. Although many sources have indicated that there are four types of clinical questions on treatment, diagnosis, prognosis and etiology[25]and also indicates the type of classifications in foreground questions, so physicians and clinical librarians should have knowledge of evidence based medicine.

One of the findings is the extent to which types of clinical questions are undertaken in background questions. Despite the facts that in EBM, the majority of clinicians' questions are foreground, the small numbers of foreground questions are not well-structured in this study, which is considered as a weak point herein. Some questions were unclear and appeared as foreground questions without PICO elements, so clinical librarians asked physicians to design their questions again with a better structure. This suggests that GPs did not follow a standard pattern to design their questions like using PICO forms. It also indicates a need for clinicians especially for clinical librarians to learn principles of EBM, tools and appropriate methods to well design clinical questions. Regardless of GPs experience in treatment of diseases, good treatment requires commitment and physicians should consider evidence based medicine as an important selection factor to make a well-organized clinical question.

However, contrary to other studies which classified clinical questions as diagnosis (29%) ,select an appropriate test(51%), choice of drug(45%), reducing the hospital stay(19%)[26] while in result reported by ely and their colleagues, clinicians' questions were categorized as Treatment (33%), Diagnostic (25%) and medication (15%), and the recommendation to patients (72%)[27,28] .In Cheryl Dee study on 144 patients, 75 questions were classified in treatment, among which 14.7% were in diagnosis,8.3% in etiology, 2.1%[29] in different aspects of psychology, while in in shokraneh study from 126 clinical questions, 84 questions stood for therapeutic/ interventional, 25 diagnostic ,8 frequency rate, 6 prognostic/prediction and 3 etiologic, and also 67% clinical questions were categorized in treatment and 20% in diagnostic. They put treatment and medication questions in one range. 48% were in type of treatment and 25% were diagnostic[30] , while in this survey most of questions were classified as medication types (92.3%) in seven specific fields of indication(21.2%), dose of drug(13.8%),the treatment of choice(6.4%), medication use(18.5%)drug side effect (34.2%) , intervention(4.6%),the cause of physical findings(0.9%).However, in Ely study, expressed, from 1396 clinical questions, the three commonest generic types were "what is the drug of choice for condition x(150 questions,11%) and what is the cause of symptom x?(115 questions,8%).[31]This study shows different ranges of generic questions asked from clinical librarians. So, this taxonomy is based on generic

types of information needed that could be used for large clinical questions asked from clinical librarians and it can be used to organize questions and answers and also to concentrate on the types of information needed.

The taxonomy can be used to classify medical areas from different medical knowledge resources to address specific types of clinical questions. If the clinical librarian provides reliable and valid information for physicians to treat a disease, they can help them to develop medical guidelines for designing a good clinical question and answers and also can be used for further clinical research.

GPs' attitudes towards the clinical librarian performance were mainly positive. In O Connor study[32], the clinical librarians' role on the improvement of nursing services has been rated 96% and their role on laboratory tests, and clinical decision making has been estimated 41.7% and19.7% respectively. Also their positive impact on specialist doctors and on General Practitioners has been reported 66% and 78% respectively.

In order to determine the effects of the evidence-based answering services on GPs, 61 questions were received from 26 GPs In Verhoeven study, in which 12% of the questions were with the highest evidence level, and in 36% no information was found. 81% of the GPs expresses their satisfaction from the positive role of CLs on the patient care33, however in health net project, the extend of satisfactions from the clinical librarians' performance and type of their services have been reported 90%. 34. Therefore the result reveals that the clinical librarian has the capability to address clinical questions and has a prominent role in health centers.

The present study did not examine the number of times and the impact of clinical librarian services on patient care but investigated General Practitioners satisfaction score of clinical librarian performance in improving patient care in rural and underserved areas. The importance of access to electronic resources was well emphasized in this study, with internet access and its speed considered especially important to answer clinical questions. Despite the lack of adequate facilities in rural areas and the fact that most of questions are categorized in drug information, so clinical librarians need to be trained in pharmacology to learn drug information and drug spelling in order to provide better information.

Clinical librarians must have adequate knowledge in the field of information retrieval and storage systems and search strategies to categorize medical topics for better response to clinical questions and also, require learning various and new medical databases for understanding the range of medical information to help physicians during the decision making process in the minimum time. They should be improved, trained and gain new professional knowledge and instructional skills in different areas. Without the support of specific training and information infrastructures such as internet, health informatics and other information technology tools, one cannot be succeeded in doing clinical projects. Clinical librarians prepare themselves for new roles, training programs provide them with an opportunity to enhance their capabilities and in point of services, they will enhance responsiveness and effectiveness of their position to meet larger health care information request. Davidoff and Florence[1] propose the need for clinical librarian to learn experience for prospective CLs, including a core of basic medical concepts, principles of clinical epidemiology, biostatics, critical appraisal, information management and accredited training program. They also participate in clinical seminars, journal clubs, review journal articles and key textbooks in evidence based medicine, general medicine and specialty areas.

Recent studies demonstrate different aspects of clinical librarian's roles in patient care and all of them reported positive result. However, to our knowledge, this is the first report of Tele Clinical librarians' roles, GPs' satisfactions score of their performance on patient care and clinicians' score to the degree of up-to-date and accuracy of answers to each clinical question in rural and underserved areas. we recommended these kinds of project continue and be considered to facilitate efficient clinical information not only for clinicians' need, but also for different health professionals in health care systems to manage their satisfaction with the clinical librarian services. Finally, In order to develop the evidence-based medicine course in Medical Universities, the implementation of clinical librarian projects in various clinical departments, hospitals and

health centers especiall in undeserved areas are highly recommended. The need for expanding literature about search strategies with training in medical databases for clinical librarians which give necessary training in evidence-based-medicine to physicians in Iran or other developing countries is strictly felt.

6. Conclusion

The study indicates clinical librarians have extensive knowledge in retrieving information. Physicians need accurate, reliable, valid and rapid answers on their spot clinical questions. Clinical librarians have the expertise to identify and to address clinicians' need to help them enhance patient safety. Therefore, we hope CLs would have an impact on physicians' clinical information needs in physicians' daily practice by providing valid, accurate and up-to-date evidence-based information. Additionally, this study indicates taxonomy of more common clinical questions asked from clinical librarians. It could be developed as a resource for further research in Iran or other Developing an developed countries.

Finally, the goal of the project was to overcome the barriers of distance to access medical information resources and Tele-Clinical librarian consultation. There is the possibility of implementing clinical librarian projects in small-scale and in case of appropriate remote communication facilities to answer clinical questions.

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Understanding Student Perceptions in Using E-Learning Portal as Knowledge Management Tool: A Study of Bodhidroom E-Learning Portal

Nirmali Chakraborty **Gautam Sarma**

Abstract

The study aims to investigate students' perceptions of using e-learning portal and to analyse the utilization of e-learning portal as knowledge management tool. A self administered questionnaire was distributed among the randomly selected 100 registered students of the Bodhidroom e-learning portal. Bodhidroom is the first e-learning portal in North-East India under the Institute of Distance and Open Learning (IDOL) of Gauhati University. E-learning portal is the platform which provides the facility of interaction among knowledge holders and seekers. As such, e-learning portal can be enhanced by combining it with another separate world of knowledge called knowledge management.

E-learning, E-learning Portal, Knowledge Management, IDOL, Bodhidroom

1. Introduction

E-Learning is now a global phenomenon in the world of higher education. In the simplest term e-learning is the use of technology to enable people to learn anytime and anywhere. It is borderless. The growth of e-learning is directly related to the increasing access to information and communications technology, as well its decreasing cost. The capacity of information and communications technology to support multimedia resource-based learning and teaching is also relevant to the growing interest in e-learning. Growing numbers of teachers are increasingly using information and communications technology to support their teaching. Moreover, the contemporary students who have grown up using information and communications technology are also interested to learn in an electronic environment. Similarly, academic institutions also have seen advantages in making their programs accessible via a range of distributed locations, including on-campus, home and other community learning or resource centres (Naidu, 2006). Thus, e-learning is getting popularity day-by day among the academic fraternity.

Presently portals have evolved to provide a customized gateway to Web information through a high level of personalization and customization. Similarly, e-learning portal is a Web-based tool that is becoming an important and popular application in higher education. Moreover, it has been predicted to be the future of all types of distance learning. E-learning portal provides a number of learning tools, including an online discussion board, course content management, a course calendar, information announcement, electronic mail, reviews, auto-marked quizzes and exams, navigation tools, access control, grade maintenance and distribution, student progress tracking, chat room etc. In the words of Al-Sadi et al. (2008), "E-learning system provides intercommunication facilities to specific topics as well as collaboration with experts and other users on various topics". Hence, more realistic and directly related information can be generated through an e-learning portal. Through e-learning portal knowledge can be update and share which can act as an active knowledge sharing and store system.

2. Objective of the Study

To find out students' perception of effective utilization of E-learning portal for knowledge management in an academic environment.

3. Research Questions

The study is motivated with the following research questions:

- Are the students aware about the Bodhidroom e-learning portal?

- Do students find the portal important for their academic purposes?
- Does the portal support electronic scholarly communication?
- Is the Portal user-friendly?
- Is there any social influence on students in using the portal?
- Are the students self efficient to use the portal?
- Do the students need special training to use the portal?
- What are the features of Bodhidroom e-learning portal and to what extent these are used by the students?

4. Methodology

For the survey of the primary data questionnaire method was adopted. For that a questionnaire was prepared on the basis of the objective of the proposed study and was distributed among the randomly selected 100 students of the Institute of Distance and Open Learning (IDOL) under Gauhati University. The only criterion in selecting the sample was that the respondents should have registered on the Bodhidroom e-learning portal.

- **Limitations of the Study** – Limitations of the present study mainly originate from the data collected by survey of 100 students only. The data collected from the respondents was only 0.8% of the total population. Usage among different age groups was also not studied. However, gender study was also not taken into account. Moreover, the study will be appropriate by using an interview approach to place participants in a realistic environment where they will be able to express the problems face during the use of e-learning portal.

5. Bodhidroom E-Learning Portal

Bodhidroom is the first e-learning portal in North-East India under the Institute of Distance and Open Learning (IDOL) of Gauhati University. Based on Moodle learning management software, Bodhidroom is facilitating course management using the following modules – Log in module, Assignment module, Chat module, Discussion forum, News forum, Question and Answer forum, Calendar module, Message module, Glossary module, Lesson module, Online self test module, Quiz module, Resource, Survey module, Wiki module, Workshop module, Recent activity module, contact module etc. To access/ view the e-Learning modules, users are required to create an account using the Create Account button as shown in the figure I. For that they have to fill out the New Account form with their details. An email will be immediately sent to their email address. Then users have to read their email, and click on the web link it contains. After that their account will be confirmed and they will be logged in to Bodhidroom. Then they have to select the course they want to participate in (shown in fig. II). They can now access the full course. From the next time they will only need to enter their personal username and password to log in to Bodhidroom and access any course they have enrolled in. Moreover, Bodhidroom is open to all, outsiders can create an account as guest users.

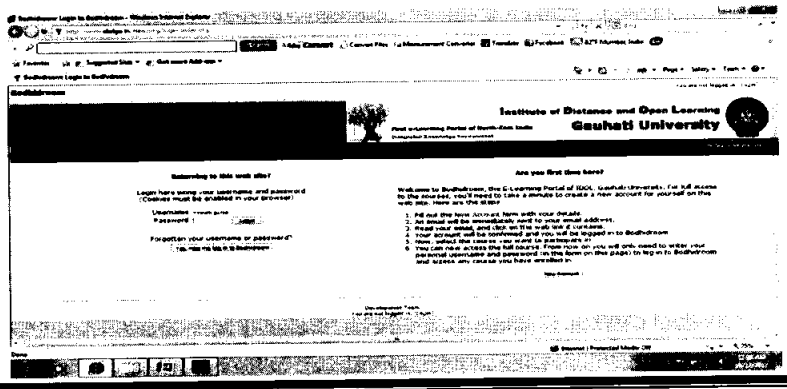


Fig. I

Currently Bodhidroom is having around 14,500 registered members. The number of registered user of Bodhidroom is given course wise in the table 1

Table 1 - Course wise number of registered user of Bodhidroom

Sl No.	Courses	No. of users
1.	MA in Assamese	947
2.	MA in English	1049
3.	MA in Political Science	1157
4.	Master of Computer Application	1379
5.	M.Sc in Information Technology	626
6.	MA in Education	525
7.	MA/M.Sc in Economics	845
8.	MA in History	422
9.	MA/M.Sc in Mathematics	624
10.	MCom	1953
11.	MA in Philosophy	266
12.	MA in Bengali	176
13.	MA in Bodo	86
14.	Master in Communication & Journalism	502
15.	MA in Nepali	64
16.	MA in Sanskrit	44
17.	Bachelor of Computer Application	365
18.	B.Sc in Information Technology	187
19.	Post Graduate Diploma in Computer Application	929
20.	Post Graduate Diploma in Sales & Marketing Management	166
21.	Post Graduate Diploma in Human Resource Management	488
22.	Post Graduate Diploma in Bussiness Management	420
23.	Post Graduate Diploma in Finance Management	196
24.	Post Graduate Diploma in Insurance & Risk Management	49
25.	Post Graduate Diploma in Banking & Finance Services	241
26.	Post Graduate Diploma in Journalism & Mass Communication	138
27.	Certificate in Computer application	183
28.	B.A. (GENERAL COURSES)	322
29.	B.Com. (GENERAL COURSE)	112
	Total	14,461

6. Data Analysis

The data were tabulated for analysis in accordance to the objective of the study. Some respondents furnished some valuable comments in the space provided for the purpose; those comments were incorporated in the appropriate places.

6.1 Basic Information of the Respondents

The Table 2 furnished below gives a brief account on the basic information of the respondents of the study. Here it is seen that out of 100 respondents 56 are male and 44 are female. Similarly out of 100 respondents 92come under 20 to 25 age group and 8 come under 26 to 30 age group. Moreover, all the respondents are having e-mail account.

Table 2: Basic Information of the Respondents

Gender	Male (56)	Female (44)
Age Group	20-25 yrs (92)	26-30 yrs (8)
E-mail Account	Yes (100)	No (0)

6.2 General Understanding and Usage of E-Learning Portal

In this section, a descriptive statistical analysis is given in order to provide a richer understanding of the students' general understanding and usage of E-Learning Portal. Table 3 summarizes the percentages of the students' general understanding and usage of E-Learning Portal. Here it is found that almost 92% percent respondents of the target group claim that they usually use computer for their study. Similarly, 87% respondents replied that they use the Web in their academic activities. Likewise, 66% respondents claimed to be familiar about the term 'e-learning' as well as 45% are aware about 'e-learning portal'. Moreover, only 48% respondents are aware about the Bodhidroom E-Learning Portal of their institute. Very less respondents have received training on the use of the Bodhidroom portal. But majority of the respondents replied that the portal supports in both the teaching and learning. Very less respondents add information to the portal. Majority of the respondents have not given any response on portal's support in electronic scholarly communication. No member of the portal is informed through their mobile phone regarding the current news in their areas of interest.

Table 3: General Understanding and Usage of E-Learning Portal

General Understanding and Usage of E-Learning Portal	Yes	No	No Response
i. Do you usually use any computer applications for your study?	92%	8%	-
ii. Do you use the Web in your academic activities?	87%	13%	-
iii. Are you familiar with the term "E-Learning"?	66%	30%	4%
iv. Are you familiar with the term "E-Learning Portal"?	45%	35%	20%
v. Are you aware about Bodhidroom E-Learning Portal of your institute?	48%	52%	-
vi. Have you ever received training on the use of Bodhidroom E-Learning Portal?	20%	80%	-
vii. Does the portal support both the teaching and learning?	73%	-	27%
viii. Does the portal enable users to access all the collections in one place and to search across them?	7%	67%	26%
ix. Does the portal support electronic scholarly communication?	27%	19%	54%
x. Does the portal connect people with common interests who work in different departments?	17%	21%	62%
xi. Can you add information to the portal?	6%	74%	20%
xii. Are the members of the portal informed through their mobile phone regarding the current news in their areas of interest?	-	97%	3%

6.3 Students' Perceptions in Using Bodhidroom E-Learning Portal

6.3.1 Performance Expectancy

A descriptive statistical analysis is described in this section in order to provide a richer understanding of the students' perceptions in Using Bodhidroom E-Learning Portal. Table 4 summarizes the percentages of the students' perceptions with respect to Performance Expectancy. As can be seen the students tend to believe that Bodhidroom is a useful and productive tool; however, they tend to be a bit more neutral in terms of their perception that Bodhidroom will increase their chances of getting a better grade.

Table 4: Descriptive Statistics for Performance Expectancy (PE)

Performance Expectancy (PE)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
PE1: I find Bodhidroom useful in my studies	0%	0%	24%	64%	12%
PE2: Using Bodhidroom enables me to accomplish tasks more quickly	0%	2%	16%	72%	10%
PE3: Using Bodhidroom increases my productivity	0%	0%	12%	84%	4%
PE4: If I use Bodhidroom, I will increase my chances of getting a better grade	0%	6%	50%	38%	6%

6.3.2 Effort Expectancy

Table 5 provides a descriptive analysis of the students' perceptions regarding Effort Expectancy. It appears that the students tend to agree that Bodhidroom is understandable, easy to use and easy to learn.

Table 5: Descriptive Statistics for Effort Expectancy (EE)

Effort Expectancy (EE)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
EE1: My interaction with Bodhidroom is clear and understandable	-	4%	25%	71%	-
EE2: It is easy for me to become skilful at using Bodhidroom	-	62%	17%	21%	-
EE3: I find Bodhidroom easy to use	-	25%	9%	66%	-
EE4: Learning to operate Bodhidroom is easy for me	-	30%	10%	60%	-

6.3.3 Attitude toward Using Bodhidroom

The descriptive statistics in Table 6 also suggest that the students surveyed tend to believe that Bodhidroom is a good idea and that they like to use it; however, they appear to be somewhat neutral in terms of learning with Bodhidroom is fun.

Table 6: Descriptive Statistics for Attitude toward Using Bodhidroom (A)

Attitude toward Using Bodhidroom (A)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
A1: Using Bodhidroom is a good idea			10%	66%	24%
A2: Using Bodhidroom is a bad idea	73%	27%			
A3: Bodhidroom makes classes more interesting		52%	30%	18%	
A4: Learning with Bodhidroom is fun		4%	59%	37%	

6.3.4 Social Influence

Interestingly, the descriptive analysis in Table 7 suggests that the students get influenced by others who think they should use Bodhidroom. They tend to agree that the professors and administrative staff support the use of Bodhidroom. But unfortunately majority of the respondents are neutral about university's in general support in using Bodhidroom.

Table 7: Descriptive Statistics for Social Influence (SI)

Social Influence (SI)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SI1: My teachers have been supportive in the use of Bodhidroom		4%	20%	76%	
SI2: In general, the university has supported in the use of Bodhidroom		25%	55%	20%	
SI3: My parents advice me to use Bodhidroom		78%	20%	2%	
SI4: My friends use Bodhidroom		5%	26%	69%	
SI5: People who are important to me think that I should use Bodhidroom		3%	87%	10%	

6.3.5 Facilitating Conditions

Fortunately, the descriptive statistics in Table 8 express the majority of the students' perceptions that they have the necessary resources and knowledge to use Bodhidroom. But they are neutral about that 'a specific person (or group) is available for assistance with difficulties they experience with Bodhidroom'.

Table 8: Descriptive Statistics for Facilitating Conditions

Facilitating Conditions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
FC1: I have the resources necessary to use Bodhidroom		3%	30%	67%	
FC2: I have the knowledge necessary to use Bodhidroom		9%	20%	71%	
FC3: Bodhidroom is not compatible with other applications I use (such as MS Word, MS Excel, etc.)		4%	42%	54%	
FC4: A specific person (or group) is available for assistance with difficulties I experience with Bodhidroom		12%	78%	10%	

6.3.6 Self-Efficacy

Table 9 provides the analysis for Self-Efficacy. Again, the students tend to agree that Bodhidroom is easy to use, but seems to be easier if they can call someone for help whenever they get stuck. Moreover a good number of respondents want the built-in help facility in the portal itself.

Table 9: Descriptive Statistics for Self-Efficacy (SE)

Self-Efficacy (SE)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SE1: I could complete most tasks using Bodhidroom if there was no one around to tell me what to do as I go		39%	42%	19%	
SE2: I could complete most tasks using Bodhidroom if I could call someone for help if I got stuck		7%	51%	42%	
SE3: I could complete most tasks using Bodhidroom with just the built-in help facility for assistance		14%	37%	49%	

6.3.7 Anxiety

Not surprisingly, given today's students exposure to technology, the students do not have a high level on anxiety when using Bodhidroom. Ofcourse, very few students feel uneasy to use Bodhidroom. Moreover, quite a good number of respondents are willing to share their knowledge through the portal.

Table 10: Descriptive Statistics for Anxiety (ANX)

Anxiety (ANX)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
ANX1: I feel uneasy to use Bodhidroom		34%	47%	19%	
ANX2: It scares me to think that I could lose a lot of information using Bodhidroom by clicking the wrong button.		73%	27%		
ANX3: I hesitate to use the system for fear of making mistakes I cannot correct.		81%	19%		
ANX4: I don't like to share my knowledge through Bodhidroom		63%	37%		

6.3.8 Features of Bodhidroom and their use

In addition to studying the Bodhidroom e-learning portal more closely, this study also looked at the features or functionality of Bodhidroom that students tend to use. As can be seen in Table 11, students use Bodhidroom mostly for obtaining course information, announcements, old question papers and online testing/quiz. Moreover, some of them use it to participate in the discussion forum as well as in the chatroom.

Table 11: Descriptive Statistics for Features of Bodhidroom (FB)

Features of Bodhidroom (FB)	Never Use	Seldom Use	Sometimes Use	Use	Often Use
FB1: Course Information		7%	24%	66%	3%
FB2: Announcements		8%	20%	39%	33%
FB3:Calendar		20%	62%	10%	8%
FB4: Online Study Materials		21%	54%	19%	6%
FB5: Discussion Forum		74%	14%	10%	2%
FB6: Old Question Papers		3%	5%	25%	67%
FB7: News Forum		74%	8%	14%	4%
FB8: Chatroom		19%	71%	8%	2%

FB9: Online Testing/Quiz		17%	14%	63%	6%
FB10: Online Tutorials		11%	13%	71%	5%
FB11: Messages		16%	31%	43%	10%
FB12: Online Help		28%	32%	32%	8%

6.4 Special Training on the use of E-Learning Portal

Here quite a good number of respondents demanded to organize special training on the use of E-Learning Portal. For that the institution should introduce special user education programme on E-Learning Portal. It serves to instruct, inform and persuade the users about the benefits of the portal. Faculties should also be given proper training for self participation in the portal and they should be well informed about its importance in teaching and learning. Moreover, users should be motivated for using the portal as well as to participate to the portal. Some of the possible mechanisms for promotion and advocacy include- workshops, seminars and presentations, leaflets, posters, newsletters and other printed literature, library orientation programme, links from institutional home page, links from library web pages etc.

Table 12: Need of Special Training on the use of E-Learning Portal

Yes	No	No Response
88%	8%	4%

6.5 Rating of the Bodhidroom E-Learning Portal

The scholar has displayed the rate of satisfaction of the students regarding the Bodhidroom e-learning portal under Table-13 for clear understanding. Here the researcher made use of Likert scale. The Likert scale ranged from "Excellent" (1) to "Very poor" (6) for all items associated with each variable.

Table13: Rating of the Bodhidroom E-Learning Portal

Excellent	Very Good	Good	Average	Poor	Very Poor	No Response
-	4%	37%	32%	12%	5%	10%

Here, Out of 100 no respondent has graded the portal as "Excellent". Similarly, only 4% have remarked the portal as "Very Good". Ofcourse, majority of the respondents (37%) have graded it as "Good" and 32% said it "Average". But, unfortunately, 12% and 5% respondents have remarked it as "Poor" and "Very Poor" respectively.

7. Findings

- All the respondents usually use computer for their study.
- Majority of the respondents use the Web in their academic activities.
- Majority of the respondents are familiar with the term 'E-Learning' and 'E-learning Portal'
- Less than 50% respondents are only aware about Bodhidroom E-Learning Portal of their institute.
- Majority of the respondents have not received training on the use of Bodhidroom E-Learning Portal
- Majority of the respondents replied that the portal supports both the teaching and learning.
- Majority of the respondents replied that the portal supports electronic scholarly communication.
- Very less respondents mentioned that they can add information to the portal.
- Members of the portal are not informed through their mobile phone regarding the current news in

their areas of interest.

- Students tend to agree that Bodhidroom is understandable, easy to use and easy to learn.
- Students believe that Bodhidroom is a good idea and that they like to use it.
- Students get influenced to use Bodhidroom by others like teachers, friends etc.
- Bodhidroom is easy to use, but seems to be easier if students can call someone for help whenever they get stuck.
- Students do not have a high level on anxiety when using Bodhidroom.
- Students use Bodhidroom mostly for obtaining course information, announcements, old question papers and online testing/quiz. Moreover, some of them use it to participate in the discussion forum as well as in the chatroom.
- Users need special training on the use of E-Learning Portal.
- Majority of the respondents have graded the portal as "Good"
- Students and teachers can manage their knowledge on Bodhidroom very easily.
- Bodhidroom can be utilized as a tool for capturing teachers' explicit and tacit knowledge for knowledge sharing. It is very user-friendly for collaborative learning.
- Bodhidroom providing ways to display publish and organize student-generated contents and thus it helps to move these knowledge to subsequent semester classes and other groups.
- Bodhidroom can provide the sense of community, appreciation, working together, problem solving, the joy of learning etc.
- Bodhidroom is providng a platform to learn, create, share, help and improve.
- All the modules of Bodhidroom is supporting knowledge management processes and organizational learning. Ofcourse, there is less impact on students' creation of knowledge, but the introduction of Bodhidroom within the organization's culture and practices might create the path.

8. Conclusion

This study has presented the importance of knowledge management (KM) and e-learning (EL) integration. How effectively the portal technology can be utilized with the KM processes for an academic environment. Knowledge management develops a mutual interacting environment for knowledge sharing among students and teachers. The learning processes of learners become efficient and innovative due to this interaction (Waheed et al, 2012). Use of KM based EL portals provide the facility of learning from a specific domain and can retrieve relevant knowledge due to course management facility. Academic portal in particular can be utilized as a very good tool for knowledge management in educational institutions. It helps as a tool for capturing teachers' as well as students' explicit and tacit knowledge, for knowledge sharing. It provides a collaborative platform across multiple institutions, for knowledge creation through the development of knowledge artefacts by learners and teachers. Moreover, Student-generated contents need ways to display, publish and organize it; and ways to move it on to subsequent semester classes and groups. That is the kind of 'knowledge management' system an academic institution need. In the discussion forums of an e-learning portal students and teachers perform socialization and then internalization and externalization for transferring the tacit knowledge into explicit knowledge takes place. Thus, the integration of portal technology with KM processes will be useful for the efficient capturing of knowledge and its sharing for quality learning.

In this paper we studied the use of an e-learning portal designed to help distance learners in the context of knowledge management processes. Bodhidroom e-learning portal, a pioneer integrated knowledge environment in North-East India, is working as a knowledge management initiative for distance learners. This paradigm shift in distance education is a proactive step taken to address the increasing sophistication of higher education systems. E-learning has been a success at GU IDOL, through providing systematic sharing of

knowledge and capture of experience, through both formal and informal online channels. It also made education more effective and less costly. Formal methods of knowledge sharing comprise online learning through interactive modules like online classes and slides presentation with narration, while informal learning comprises of peer group discussion and chat room. Both elements have been essential in making e-learning a success and in creating a lifelong learning culture in GU IDOL. Of course, students are advised to make good use of these online e-learning resources to gain better understanding of the subjects matter and to facilitate better participation. The study reveals that the awareness level of the respondents regarding the utilization of e-learning portal as knowledge management tool is very low. Therefore, the institution should create awareness among the users as well as faculties by conducting programmes, such as orientation programs, demonstrations, workshops, conferences, seminars and through notices regarding the complete potential of the e-learning portal and their use as knowledge management tool. Moreover, faculties should motivate their students to participate in the e-learning portal.

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Challenges and Opportunities of University & College Libraries in Digital Era: *A Descriptive Analysis with Special Reference to Delhi & Uttarakhand*

Pandey, S N et. al



The present study on university libraries in Delhi & Uttarakhand state indicate that libraries in India have to go long way to become IT based knowledge system or to call as Digital Libraries or Virtual Libraries. In view of transformation that is taking place in university libraries and library services, it has become essential that library managers and library authorities must understand the importance of change & transition. Here authors have tried to find out the ways & means for better accessing of university library services and challenges. A survey on university library services and challenges in Delhi & Uttarakhand State has been conducted for this purpose. All the present problems and further prospects, majority of the university libraries as per the study are concentrating of information service resources for their users' demand and they are yet to change their mindset towards challenges and opportunities in this Cyber age.



University Libraries, Delhi, Uttarakhand, Digital Era, Descriptive analysis, IT, Library Management, Opportunities

1. Introduction

The information explosion and information technology revolution has led to emergence of electronic information era. Rapid advances in information processing, storage and communication - technology have revolutionized the role of automated libraries in disseminating information services to their users. Today the achieving of maximum knowledge of culture, evaluation and collection even the information of purchase and sale is overflowing with a great speed. Today there are thousands of new libraries which were established in the time of Industrial Revolution due to high literacy rate. Digital computer and internet service is used today through new technique. On Line collection is used in modern libraries. Academic library is increasing day by day under the supervision of Librarian who is trained with modern techniques and best skills to provide various services. Users need to more information literate. Digital Technology has enhanced the access to more and more information worldwide. The use of modern technology for services are effecting rapidly in the different areas of academic libraries in Uttarakhand and Delhi such as, Circulation service, Usage of the library, Reference service, SDI Services, Bibliography, Documentation service, Modern Techniques in library, Internet facility, Audio -visual service, Library automation, Digital Preservation, Research enhancement, Promote library planning assessment and Empowering the users with requisite information.

2. Objective of this study

- To identify the types of document
- To identify the tools
- To examine the processing of books
- To know about different activity & services of library management for users & research.
- Identification of the techniques
- Maintenance of library collection
- To know the SDI & CAS services given to research scholars properly.
- To know information Techniques and information literacy
- To know the awareness & usage of library resources, preservation, arrangement and modern digitization technique.

- To know collection development, budget, HRD Department and the Knowledge managements
- To know the find out various problems and challenges of Academic Libraries in Uttarakhand and Delhi to find solution for the same

3. Scope of study and subjects

In this study, there are 20 University and higher academic college libraries in Uttarakhand and Delhi state have been selected to study and examine their activities, problems and services in their libraries in the cyber age. Therefore, preventing the situation and its study for the well being of society, students and Research Scholar, a survey has been conducted among 20 Universities & College libraries through oral conversation and the Questionnaires to get the information of particular cultural, academic & research dimension for the growth and development of Academic Libraries. All these 20 libraries are displayed in Table A accordingly.

4. Research Methodology

A survey has been conducted through the sample survey methodology with questionnaire to Universities & college libraries by making reasonable structured questions to get a conclusion through proper data analysis. After analyzing data provided by the Colleges and the Universities of Delhi and Uttarakhand academic libraries, we could come to following conclusion through scientific & logical analysis.

5. Data analysis

Table 1 - Distribution of Questionnaire & Response of Uttarakhand and Delhi Based Different Libraries

S.N	Name of University and College	Establi-shment	Type of library	Form of organisation	Questionnaire Distrubuted through		Response Received or Not	Library Incharge
					Post	Individual		
1	G.K. Univ. Hardwar	1902	Academic	SGF&PM	NO	Yes	Yes	Prof. Incharge
2	Dev Sanskriti Univ.,Har.	2002	Academic	SGPU	NO	Yes	Yes	Dr. Kalpna Gayakwad
3	Univ. of Petroleum,,D.Dun	2003	Academic	SGPU	NO	Yes	Yes	Prof.Incharge
4	ICFAI University, D.Dun	NM	Academic	SGPU	NO	Yes	Yes	NM
5	Doon University, D.Dun	2005	Academic	SGFU&AUT	NO	Yes	Yes	VC
6	Himgiri Zee Univ., D.Dun	2003	Academic	SGPU	NO	Yes	Yes	VC
7	Grafic Era Univ. D.Dun,	2008	Academic	SGPU	NO	Yes	Yes	NM
8	Uttarachanal Univ., D.Dun	2013	Academic	SGPU	NO	Yes	Yes	VC
9	IMS University, D.Dun	1996	Academic	SGPU	NO	Yes	Yes	NM
10	G.B.Pant Univ. P.Nagar	1960	Academic	SGFU	NO	Yes	Yes	Dr. Abha Ahuja
11	Kumaon Univ.,Almora	1973	Academic	SGFU	NO	Yes	Yes	Prof. N.C. Dhaundiyal
12	DIT Univ. Dehradun	1998	Academic	SGPU	NO	Yes	Yes	VC
13	HNB.Garhwal Univ.Shrinagar	1973	Academic	CGU	NO	Yes	Yes	Prof.Incharge
14	DAV (PG) College	1944	Academic	SGF&PM	NO	Yes	Yes	Dr. Devendra Bhasin
15	DBS (PG) College	NM	Academic	SGF&PM	NO	Yes	Yes	NM
16	MKP (PG) College	1958	Academic	SGF&PM	NO	Yes	Yes	Dr. Indu Singh
17	University of Delhi	1922	Academic	CGU	NO	Yes	Yes	Dr. S.C. Jindal
18	J.N.U, New Delhi	1969	Academic	CGU	NO	Yes	Yes	Dr. Ramesh c. Gaur
19	IGNOU, New Delhi	1985	Academic	CGU	NO	Yes	Yes	Sudir Kumar Arora
20	J.M.IslamiaUniversity, New Delhi	1920	Academic	CGU	NO	Yes	Yes	Prof.S.M.Sajid

Table 2 - Distribution of users and Documents in Uttarakhand and Delhi based Academic Libraries

S.N.	Name of University and Collage	Text Book Materials			Non Book Materials		Electronic Document	
		No. of Users Daily	Total Collection of Books	Ref. Books/ Rare Books	Journals / current Tittles	No. of Bound vol.	Thesis Collec.	C.D. or Floppy
1	G.K. Univ. Hardwar	300	169608	NM	PJ=97 OEJ=7500	NM	NM	-
2	Dev Sanskriti Univ.,Har.	500	2700	NM	60	NM	NM	-
3	Univ. of Petroleum,D.Dun	530	7000	NM	PJ=134 OEJ=08	400	NM	-
4	ICFAI University, D.Dun	75	25000	NM	03	NM	NM	-
5	Doon University, D.Dun	100	4700	NM	68	NM	NM	-
6	Himgiri Zee Univ., D.Dun	100	700	NM	20	NM	NM	-
7	Grafic Era Univ. D.Dun,	NM	8800 E=14	NM	PJ=170	NM	NIL	-
8	Uttarachanal Univ., D.Dun	500	7500	NM	PJ=100 OEJ=100	500	NIL	2000
9	IMS University, D.Dun	200	4600	NM	PJ=152 OEJ=10	182	NIL	342
10	G.B.Pant Univ. P.Nagar	NM	2.5 Lakh	50000	400 APPX	80000	20000	06
11	Kumaon Univ.,Almora	NM	203143	NM	P=29	NM	NM	NM
12	DIT Univ. Dehradun	300	70000	NM	P=95 OEJ=200	NM	NM	2000
13	HNB.Garhwal Univ.Shrinagar	NM	171503	NM	NM	NM	4537	342
14	DAV (PG) College	610	180000	NM	PJ=15	1000	NIL	NIL
15	DBS (PG) College	100	3800	NM	NM	NM	NM	NM
16	MKP (PG) College	75	8000	3000	PJ=34	-	400	-
17	University of Delhi	NC	NC	NM	P=420	NM	NM	NM
18	J.N.U, New Delhi	NM	568002	500	P=900 OEJ=35000	108752	14000	NM
19	IGNOU, New Delhi	NM	1.5Lakh	NM	P= 490 OJ= 75000	12558	120	1711
20	J.M.IslamiaUniversity, New Delhi	NM	3.85Lakh	1500	P=250 OJ=7000	2000	450	NM

Note: No = Number; NM = Not Mentioned; NC= Not clear; PJ = Printed Journals; OEJ = Online Electronic Journals

- **Data analysis:**It is clear through the analysis of data from the table no- A & 1 that how many users are visiting the University and College library; here users are found maximum in Petroleum University, Dehradun and G.K University, Hardwar.This data reveals that high quality of education depend in library services. It is also clear that the G.K University stand in 4th position and their users are very satisfied but the position of other colleges is that they don't want to disclose their actual position of users & other activities clearly. Here DAV (PG) College is counted as one of the biggest college in the State but their daily users are only few in library. Undoubtedly, this picture does not show the actual condition of the library. In case of daily users data they have provided only monthly users list, which shows that they have 10 users per day, but the collection of books in DAV. (PG) College is more than 1, 80,000. It is also not correct answer. In G.K. University they have much precious and rare collection of books & manuscripts & archival materials in their Library. MKP (PG) College, Graphic Era, and Uttaranchal Univ. has large collection of library books. This table relates to the position of Uttarakhand academic libraries. Some Universities and Colleges did not disclose the number of collection of thesis they have, except MKP College. Their negligence does not show the bright prospect of the future Scholar. Besides, the collection of Electronic documents like CD or Floppy in Private Universities and the use of new computers in Libraries are always beneficial and

helpful for the students on growth and development of Posterity. Different services given through the computerization and the using electronic Journals need to be more useful. It gives an analysis that Govt. colleges are not giving service in proper way. They should follow the norms as per the UGC. This survey has been conducted as per the written as well as well conversation through reasonable questionnair.

Table- 3 Distribution of Library Staff, Proper Pay Scales (6th Pay Commission & UGC Scales) and given Pay scales or Lump- Sum Pay and vacant Status according to UGC Norms in Uttarakhand and Delhi Based Academic Libraries

S.N	Name of University and Collage	Univ. Lib.	Dy. Univ.Lib.	Asstt. Univ.lib.	Inf.scientis/ Doc.offi cer	Chief. Librarain	SPA/ SLIA/ LIA	Prof. Asstt.	Semi PA	Clas si.	Cata.	Pres Asstt.	Book Bind	Lib Attd.	Dailly Wages
1	G.K. Univ. Hardwar	-	-	01	01	-	-	15	-	-	-	-	-	-	14
2	Dev Sanskriti Univ.,Har.	-	-	-	-	-	-	05	-	-	-	-	-	-	10
3	Univ. of Petroleum,D.Dun	-	02	-	-	-	-	-	03	-	-	-	-	03	-
4	ICFAI University, D.Dun	-	-	-	-	-	-	09	-	-	-	-	-	-	-
5	Doon University, D.Dun	-	-	01	-	-	-	01	-	-	-	-	-	1	2
6	Himgiri Zee Univ., D.Dun	-	-	01(con .sal)	-	-	-	-	-	-	-	-	-	-	-
7	Grafic Era Univ. D.Dun,	01	04	-	01	-	04	-	-	02	02	01	-	04	02
8	Uttarachanal Univ., D.Dun	01	01	-	-	-	01	01	-	-	-	--	-	01	01
9	IMS University, D.Dun	01	-	01	-	-	01	-	-	-	-	-	-	-	01
10	G.B.Pant Univ. P.Nagar	-	2	7	-	-	01	-	11	-	-	-	-	-	-
11	Kumaon Univ.,Almora	1	-	-	-	-	-	-	04	-	-	-	01	05	02
12	DIT Univ. Dehradun	01	01	01	-	-	04	-	-	-	-	-	-	04	-
13	HNB.Garhwal Univ.Shrinagar	01	-	-	-	-	-	-	-	-	03	-	-	-	-
14	DAV (PG) College	Yes	-	-	-	-	-	-	-	-	-	-	-	-	-
15	DBS (PG) College														
16	MKP (PG) College	-	-	-	-	-	04	-	-	-	-	-	01	03	-
17	University of Delhi	-	05	06	-	-	-	35	42	-	-	-	-	34	125
18	J.N.University, New Delhi	01	03	13	-	-	-	21	27	-	-	-	1	29	06
19	IGN.Open University, New Delhi	01	02	01	01	-	-	03	09	-	-	-	-	02	-
20	J.M.IslamiaUniversity, New Delhi	01	01	05	-	-	-	-	-	-	-	-	-	-	-

Note : Univ. Lib = University Librarian; SPA= Senior Professional Assistant; Cata = Catalogour; Dy. Lib = Deputy University Librarian; SLIA = Senior Lib& Inf. Asstt.; Pres Asstt=Preservation Asstt.; Asstt. Univ. Lib. = Assistant University Librarian; LIA = Lib& Inf. Assistant; Cons. Sal. = Consolidated Salary

The analysis of data shown in Table 3 represents the problem faced by Colleges and Universities. in UK Most of all Universities and Colleges have not filled up vacancies as per the rule of UGC. They are not paying the proper salary as per the rule; even vacancies are filled up not as per requisite qualification and UGC norms Though Universities and Colleges are added with the UGC norms to fill up the post as per the rule

It is very sad full and disgusting for any University Library or Colleges. This could make very humorous situation for the Universities and colleges also. If they do not fill up the vacancy timely they can't provide the satisfactory services to the users? If they not filled up the computer literate post they would not give any computer based service on time to the users. This situation affects the quality of Uttarakhand based Universities & colleges in comparison with other States Universities & college libraries. Here, it is most important fact seeing that Uttarakhand and Delhi University Library have problems same and parallel different activities also.

Table 4 - Distribution of services Rendered by Uttarakhand and Delhi Based Academic Libraries

S. N.	Name of University and Collage	Cir. of Doc.	Photo. Ser.	AVS ser.	INS ser.	Access system	RRS ser.	CAS ser.	SDI ser.	INTER NET	Soft ware	Class. Sys.	Cat. Sys.	Web. Ser.
1	G.K. Univ. Hardwar	Yes	No	No	Yes	Open Access	Yes	No	Yes	Yes	Yes	DDC	AACR-II	NM
2	Dev Sanskriti Univ., Har.	Yes	No	No	Yes	do	Yes	No	No	Yes	Yes	DDC	AACR-II	www.dsvv.ac.in
3	Univ. of Petroleum, D.Dun	Yes	No	No	Yes	do	Yes	No	Yes	Yes	Yes	DDC	AACR-II	NM
4	ICFAI University, D.Dun	Yes	No	No	Yes	do	Yes	No	No	Yes	Yes	DDC	NM	NM
5	Doon University, D.Dun	Yes	No	No	Yes	do	Yes	No	No	Yes	Yes	DDC	NM	NM
6	Himgiri Zee Univ., D.Dun	Yes	No	No	Yes	do	Yes	No	No	Yes	Yes	DDC	NM	Work in progress
7	Grafic Era Univ. D.Dun,	Yes	No	Yes	Yes	do	Yes	No	No	Yes	Yes	DDC	NM	NM
8	Uttarachanal Univ., D.Dun	Yes	No	No	Yes	do	Yes	Yes	Yes	Yes	Yes	UDC	AACR-II	www. uttaranchaluni. ac.in
9	IMS University, D.Dun	Yes	No	No	Yes	do	Yes	No	No	Yes	Yes	UDC	AACR-II	NM
10	G.B.Pant Univ. P.Nagar	Yes	No	No	Yes	do	Yes	No	No	Yes	Yes	DDC	AACR-II	NM
11	Kumaon Univ.,Almora	Yes	No	No	Yes	do	Yes	No	No	Yes	Yes	DDC	AACR-II	NM
12	DIT Univ. Dehradun	Yes	No	No	Yes	do	Yes	No	No	Yes	Yes	DDC	AACR-II	NM
13	HNB.Garhwal Univ.Shrinagar	Yes	No	No	Yes	do	Yes	No	No	Yes	Yes	DDC	AACR-II	NM
14	DAV (PG) College	Yes	No	No	Yes	Closed	Yes	No	No	No	No	N/A	NM	NM
15	DBS (PG) College	Yes	No	No	Yes	do	Yes	No	No	No	No	N/A	NM	NM
16	MKP (PG) College	Yes	No	No	Yes	do	Yes	No	No	No	No	N/A	NM	No
17	University of Delhi	Yes	No	No	Yes	Open	Yes	No	No	Yes	Yes	DDC	AACR-II	NM
18	J.N.University, New Delhi	Yes	No	No	Yes	do	Yes	No	No	Yes	Yes	DDC	AACR-II	MENTION TO SEE Univ.
19	IGN.Open University, New Delhi	Yes	No	No	Yes	do	Yes	No	No	Yes	Yes	DDC	AACR-II	www.ignou.ac.in/library
20	J.M.IslamiaUniversity, New Delhi	Yes	No	No	Yes	do	Yes	No	NO	Yes	Yes	DDC	AACR-II	NO

Note:
AVS = Audio Visual Services
RRS = Reading Room Services
CAS = Current Awareness Services
Avai = Available
SDI = Selective Dissemination of Information
Soft = Library Software
Cata = Cataloging System
Classi= Classification System

Table 4 depicts that all 20 Universities and Colleges of UK & Delhi have proper circulation of documents but the respondents have told that they don't have photo copying & Internet service, except Graphic Era University, maximum University of Uttarakhand & Delhi state have no this type of facility available. Three Colleges of Uttarakhand like DAV (PG) College, DBS &MKP (PG) College have no way to access current awareness services, selective dissemination of information services and faculty members are being deprived by the Colleges to use Internet facility as they do not have Internet connectivity. These three colleges are not even using any Library Software and proper computer facility, that's why they are not responding to give the information of their Classification and Cataloging using System and other documentation services.

Table 5 - Distribution of Library Budget System, Fine System, Modernization of Library and Digitalization of Archival Material

S. N.	Name of University and Collage	Fine Charge System	Library Budget Allocation	Computerization	Digitized	Semi digitized	Manual/S. Manual	Lib. Software	Digital Preservation Facility
1	G.K. Univ. Hardwar	Actual cost +10% extra	Flexible	Yes	Yes	Yes	Yes	LIBSYS& Soul	Yes
2	Dev Sanskriti Univ.,Har.	NM	Flexible	Working Progress	No	-	Traditional	-	-
3	Univ. of Petroleum,D.Dun	Yes	Flexible	Working Progress	No	-	Traditional	-	-
4	ICFAI University, D.Dun	Yes	Flexible	Working Progress	No	-	Traditional	-	-
5	Doon University, D.Dun	Yes	Flexible	Computerized	No	-	-	LIBSYS	-
6	Himgiri Zee Univ., D.Dun	NM	Flexible	Process is running	No	-	Manual	-	-
7	Grafic Era Univ. D.Dun,	Yes	Flexible	Computerized	No	-	Manual	LIBSYS	-
8	Uttarachanal Univ., D.Dun	Yes	Flexible	Computerized	No	-	Manual	LIBSYS	-
9	IMS University, D.Dun	Yes	Flexible	Computerized	No	Yes	Manual	LIBSYS	-
10	G.B.Pant Univ. P.Nagar	Cost of the Book	Flexible	Yes	No	Yes	Yes	KOHA	Yes
11	Kumaon Univ. Almora	New material or double cost	Flexible	Yes	No	No	No	TLSS	Yes
12	DIT Univ. Dehradun	Double cost	Flexible	Yes	No	No	No	LIBSYS	NM
13	HNB.Garhwal Univ. Shrinagar	Latest edition cost	Flexible	No	NO	No	Yes	NO	NO
14	DAV (PG) College	Yes	Flexible	-	No	-	Traditional	-	-
15	DBS (PG) College	Yes	Flexible	-	No	-	Traditional	-	-
16	MKP (PG) College	Yes	Flexible	-	No	-	Traditional	SOUL	-
17	University of Delhi	NM	Flexible	Yes (for Rare collection Digitization	Yes	No	No	TROODON	NM
18	J.N. University, New Delhi	In Website	Flexible	Yes (Digi also)	Yes	No	No	NM	Yes
19	IGN.Open University, New Delhi	5Rs Par day & Cost of New book	Flexible	Yes (Digi No)	No	No	No	LIBSYS	Yes
20	J.M. Islamia University, New Delhi	5000 + 10% Handling charges	Flexible	Yes (Digi No)	No	No	No	LIBSYS	Yes

Note: DIGI= Digitization

This table shows that 3 college libraries have closed access system. Besides, G.K. Univ. Hardwar and Dev Sanskrit University have no fine system, though many other colleges think that it is required. In case of library budget allocation, Univ. & colleges are flexible. They managed as per their demand and situation. Four Colleges have computerized services and some colleges are working in that direction. Some Universities and Colleges are realizing the need of Digitization. As per the UGC norms only G.K. University, Hardwar is using the SOUL Software but not even one is using it. Some Universities & Colleges are using Libsys Software for the library management, as it is available at affordable cost. In modern library mgt system especially for the Universities, it is a matter of regret that the proper digitization facility of archival materials is not available except G.K. University, Hardwar as they have some rare collection of different subjects.

6. Findings

- Maximum numbers of universities & colleges have minimum number of daily users though they have good library Collection.
- Maximum universities are unaware about the thesis collection and research work which is seen fully dissatisfied condition, only few college and University having Electronic documents.
- Maximum Universities have in educative faculty. They even do not have concern to fill up the post as per the UGC norms.
- Salary of the Faculty Members in those Univ. and Colleges are not satisfactory as it is not as per the norms of UGC.
- There are many vacancies in Govt. and Private Universities that means there is no Flexibility between Users and Staff.
- Maximum Universities have the proper circulation of documents and maximum is using Computer and Internet facility.
- Maximum no of Universities and Colleges have their own library software and Reading Room Services (RRS).
- It is evident from the analysis that three colleges of Dehradun have no photocopy services and Audio Visual Services (AVS) available.
- Only G.K. University, Hardwar has Digital Preservation facility and they are using both SOUL and LIBSYS Software.
- Three Universities didn't disclose about their fine collection details.

7. Suggestions

Based on the findings of the study the following suggestions are placed to improve the conditions of the library in Universities and Colleges of Uttarakhand and Delhi.

- There is need to enhance the reading habit so that more users visit the library to. There is need to equip the leadership qualities among the library professionals also. They should create and motivate the users to avail the library services and the library professionals should to know the needs of the users.
- Attitude and behavior of library staff must be more helpful towards the users.
- Library Staff should assist the users in using information technology.
- Conduct training program for computer literacy.
- Salary should be given as per the norms of UGC. This helps to get highest satisfaction during library profession.
- Universities and Colleges should have book binding facility for the proper maintenance of the text.
- University library should provide Audio-Visual Services (AVS) and Current Awareness Services (CAS) with SDI services.

- Academic libraries should be equipped with Library Automation with proper training program for the library staff. Internet facility should be efficient and effective in libraries.
- Universities must have Photocopy services for users, teaching staff, etc.
- Library mgt Software should be used in all Universities and Digitization work of their library collection.
- Universities and colleges should take fine for the damage and loss of books
- Digitization of Archival materials should be used as sporty technique to enhance its access and use of technology for conservation, preservation and dissemination of its content.

8. Conclusion

Library is the heart of Academics. Many Colleges and University libraries in Uttarakhand and Delhi are in the process of developing and some have already in developed. Some Colleges & Universities are using modern techniques with great enthusiasm. But, there should be awareness regarding digital technology, internet, and maintenance of rare collection, proper documentation & preservation, professional competence with modern techniques and to find out the satisfaction level of research scholars. Innovative Challenges of Universities and Colleges should be helpful to guide the Research Scholars. Universities and Colleges should take care about their research collection. Otherwise students of Uttarakhand and Delhi state will not be beneficial in the field. In up gradation and effective management of libraries, the real challenge today is very hectic & tedious. Different services and co-ordination of all university libraries and colleges can build up a quality world in the library profession and the field of literature. Sincere service of the librarian and honesty in the profession can make a new door step in the field of library Science in Uttarakhand. So, welcome a beautiful aware and educated future for the next generation with the up gradation of better qualities of academic libraries in Uttarakhand and Delhi State

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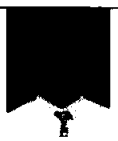
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Changing Landscape of Library Services: *A Study Application of Mobile Technology*

Menika Patel **Mishra, J K**



In current scenario mobile in one of the most important asset of human life and easily available all peoples. Since, the library in source of information and information should be transferred anywhere to mobile technology is also becomes very useful for libraries. This paper presents the usefulness of mobile technology in libraries. Now a days, library should be accessible "anywhere anytime" hence mobiles with internal connectivity will helps us to full fill our requirements. This article also explains all the newly developed technology for easy accessibility of library users. We also focus the usefulness of these technologies to library service providers.



SMS, Video Chat, QR-Code, Wireless Access Protocol, Interactive Voice Response, PDA, Airpac

1. Introduction

Mobile helped give the user's anytime access to their library facilities. Users could check out their account details, get their transactions statements like book issue, return, reissue with details, notices, alerts etc. in the comfort of their hostels, campus, everywhere, and also the various services provide the users like reference services, CAS, SDI, VRS etc. The main reason that mobile technology feature use in library to access "anywhere anytime". User's don't need a computer terminal for access his/her library accounts. Just one handy device (Mobile) is providing all information about the library general information and also library services. Now a day various application/software develop (i.e. PocketCirc-software, Android Developers, AirPac (Innovative Interfaces etc.) to support these services easily access on the mobile device.

Mobile technology not only use in library services they are also use in library management like Barcode or RFID and OPACs will develop GIS (Geographic Information System) sensitivity. We will expect having large component of asynchronous voice messaging including threaded discussions using v-mail technologies that will help the staff in providing ready reference service leaving behind texting and SMS. In future v-mail as well as mobile v-blogging can well enhance the usage mobiles. Mobile web 2.0 application use social networking for library community should be realised that enables discussions, blogs, wikis and other features beneficial for all library growth. Privacy and copyright should be matter of concern in future due to the availability of web contents 24*7 and possibilities of its damage and loss in the computer and also mobile searches by all the individuals without any authentication or identification.

The focus of this paper is on mobile technology using the libraries now days various type services provide to users and also discussed the security measure.

2. Mobile Technology a Boon

Basically information transfer easily and anywhere through mobiles device connect to a wireless communication network through radio wave or satellite transmission. Most of mobile device provide voice communications, short message service (SMS), multimedia message service (MMS) and newer phones may also provide internet service such as web browsing and e-mail like Smartphones, Tablets etc.

3. Mobile Technology versus Libraries

Mobile Technology has now come up with "Libraries in Hand" trend. Our librarians are in move to determine how these devices are affecting information access and ensure that they are communicating with patrons and providing web content in the most appropriate and effective ways. Our Librarians must be

gateway that further connects to the mobile service providers than SMS centre. There are various hosted IP based SMS gateways available in the market and also available some open source software, like: kannel.

- **WAP (Wireless Access Protocol):** WAP (Wireless Access Protocol) uses a concept similar to that used in library through internet. Libraries maintain WAP sites which user's access using a WAP compatible browser on their mobile phones. WAP sites offer the familiar form based interface and can also implement security quite effectively. The library user can use anytime, anywhere access to a secure reliable service are allows them to access all enquiry and transaction based service along with more services provide through their mobile device. A WAP based service requires hosting a WAP gateway. Mobile application users are access the library's site through the WAP gateway to carry out transactions, its need like web portal for accessing the library services.

- **Standalone Mobile Application Clients:** Standalone mobile applications are the one of the hold out the most promise as they are most suitable to implement complex library transaction like issue/Return securities. They can be easily customized according to the user interface complexity supported by the mobile. In addition, mobile applications enable the implementation of a very secure and reliable channel of communication. One requirement of mobile applications users is that they require to be downloaded on the client device before they can be used which further require the mobile device to support one of the many development environment like J2ME or Qualcomm's BREW. J2ME is fast becoming an industry standard to deploy mobile phone to support Java. The major disadvantage of mobile application clients is that the applications needs to be customized to each mobile phone on which it might finally run. J2ME ties together the API for mobile phone which has the similar, functionality in what it calls "profiles".

8. Application of Mobile Technology Use in Library Services

- **General User Information-** Library was sent the all information like overdue, alerts book details, account transaction, new arrivals, circulars/notice, virtual tour, subscribed e-resources, library timing, upcoming events etc.

They all information through group or individual SMS and now days this type of facility/application are available integrated library management system/software.

- **OPAC-** Library user/patron can access library catalogue (WebOpac) through their mobile device like user account, reservation (request) and renew their items on their own wireless device (PDA, web enabled phones, web tablet), it's product will auto detect for format according the catalogue with graphics or without graphics for better view. WebOpac software (e.g. Airpac.Add.on product, libsirsi-dynix).

- **Reference Services**– Libraries are provide both type of services like ready reference service and long range reference service and also the referral service. The mobile technology using in library user for easily connect to online or text SMS, video chat directly connect to the library staff/ librarian, the library staff/librarian are provide the answer 'reference queries' various messaging services are free (like Google, Way2SMS etc. and also fee based tools like texta librarian, libraryH3IP, Myinfoquest and Shoutbomb).

- **E-resources**- Library subscribed so many e-resources. User can use these resources his/her own mobile device (like e-books, e-journal, e-zines, audio language courses book, multimedia devices e-databases etc.). User can also access these resources anywhere, anytime. It is also help for formal education, distance learning and e-learning.

- **QR Codes**- QR code stands for 'quick response' and basically two-dimensional bar codes that can contain any alphanumeric text and often used to store URL's, text etc., known as 'mobile tagging'. QR codes are used in commercial tracking, logistics, inventory control and advertising. Data can be translated into a

QR code by any QR generator, the software of QE code are available freely. Users simply enter the data to be translated and generator produces the code, which can be displayed electronically or in printed format. Decoding the information can be done with any mobile with camera and supported with QR reader. It is freely available from various website. Libraries can use QR codes to label of books, journals, audio/visual, and offprints, add QR codes in WebOpac and other places. Users can use QR code for his/her own mobile and its help them capture the QR code. After decodes the picture translates, details, information, location can be display on the mobile.

The QR code can be scanned and saved for further use on mobile. QR codes not only link to websites, It is can be used to send prewritten data for SMS, mail etc. They are designed to cope with a high- level of error, hence are suitable for outdoor use.

9. Using Mobile Technology in Libraries Advantages and Disadvantages

Advantages

- Scalability and Reliability: Library are using the mobile technology the user may be sitting in any part of the world (Anytime, anywhere) and hence library need to ensure that the systems are up and running in a true 24x7. As user will find mobile technology in library more and more useful, their expectations from the solution will increase.
- Application Distribution: Due to the nature of the connectivity between library and its user it would be impractical to expect users to regular upgrade of their mobile application. It will be expected that the mobile application itself check the upgrades and updates and download necessary patches (so called "over the air" updates).
- Cell phones and other mobile technology devices have created a way for library user across the globe to easily stay in touch.
- Wireless connectivity is easy to maintain and is convenient to both of library and users.
- The biggest advantages that mobile technology offers a library is that it drastically cuts down the costs of providing services to the users.
- Mobile technology is helping services providers increase habitual users. Library provide the increasingly using the complexity of their supported mobile technology to attract new users and retain old ones.
- A very effective way of improving library service for better inform to users (e-browser)
- The library could remind users of outstanding due dates, over dues etc. The users can check their account detail on the mobile phone.
- The user can also sent request for ILL, reference query, suggestions and complains. Libraries will also reply the same though automatically mail and SMS.
- Such message also bear the virtue of being targeted and personal making the services offered more effective. They will also carry better results on account of better customer profiling.
- Yet another benefit is the anywhere/anytime characteristics of mobile services. A mobile most of the time with the user. The user does not have to visit the library for avail the library services.

Disadvantages

- Mobile phones can be expensive.
- Sometimes the function is poor in some area for limited connectivity.

- Because of there are smaller size screen, so that we can't read easily.
- Requirement of experience staff.
- Screen quality/require application (S/W)
- Network congestion.
- Slow speed of the internet.
- There is no reference interview process
- User has limited number of character to express their query.
- Library staffs have also limited number of characters for reply to the user.

10. Security Measures

- Authentication of the device with service provider before initiating a transaction. This would ensure those unauthorized devices are not connected to perform transactions.
- User ID/Password authentication of library user.
- Encryption of the data being transmitted over the air.
- Encryption of the data that will be stored in device for presently/off-line.

11. Conclusion

Library services should be flexible and user needs satisfy with new technology. The present libraries adopted mobile technology to connect the user in library and user are also access all the information through mobile device easily. It is very important for libraries to be dynamic and change theirs outlook to adopt new technologies and develop the new way relationship with users.

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Concerns of Space Management in Indian University Libraries: Based on Drastic Changes of Content and New Trends

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In this article the authors are analyzing the present Indian scenario, and realizing that the need of appropriate norms and standards for library space management in the age of digital shift. The international level organizations like IFLA, ALA, Library Journal etc.- the events, persons and associations which are committed to the promotion of the same cause. There is a quest for quality in India so they suggested that the government organizations like UGC, NACC etc. and the non government ionizations have to undertake this task. They focus on two criteria to formulate an integrated norms and sanders for the management of library space, namely1. Drastic Changes of Content 2. New Trends in Library Space Management. New trends are three: 1.Ten Commandments for Space Designing in Libraries 2. Concept of Learning Space 3. Increase in non-library activities housed in library. Present-day curriculum of library and information science is very weak in equipping librarians with the knowledge of library planning, library space designing and library space management. The India has to plan properly to invest this enormous amount of potency with consciousness in the process of designing the libraries with excellent space management to design the knowledgeable society for a nation of grate enlightenment.



Space Management, Trends in Library resources, University libraries, India

1. Introduction

A new world order has set in with a networked information-based society as the central hub of living, with trade, economy, occupation, development, education, culture and leisure - all centred around it. Changes in information technology have changed every facet of life and of library activities. In libraries, the real and the virtual have co-existed in varying ratios for several decades. Library design approaches have moved from accommodating the real to the virtual. "Readers" have become "viewers", "listeners" and "networkers" (Cribb, G. & Schmidt, J. 2011). The networked society has brought about a new style of existence for the humanity with a power to transcend space and time barriers. Accordingly, knowledge management scenario has undergone drastic and revolutionary changes in record formats, storage and dissemination methods, and the related spaces.

Methods used for content management in libraries also need to blend traditional and modern techniques and formats. Good planning and designing require bringing both traditional collections and functions into harmony with new technology and new services (Thomas, M. A. 2000). Now information to anyone, at anytime, anywhere, on anything, and in any format has become the need and trend of the time. Current digital society implies that most of the human beings have 24-hour access to the information network. This also necessitates changes in techniques and methods of content management systems.

This article intends to bring attention and equip librarians to creatively use the space and to scientifically manage the content in higher education centres and university libraries. The electronic revolution that took place in 1980's had a major impact upon the library space and functions (Childs, Sarah, Matthews, Graham & Walton, Graham. 2013). The technological changes rose to such an extent that the 1990s was considered to be a "threshold moment" in the library history (Bloch, R. H. & Hesse, C.1993).

The creative designing of space for conserving and utilizing recorded knowledge-content has passed through dramatic and drastic changes from the days in which human beings inscribed their experiences in the cave walls to the present day where they store and retrieve content from cloud space or walk through virtual space seeking knowledge. In this digital era the concept of space needs clarification to answer the

questions such as "What is the status of physical space in the digital era?" "What are the innovative trends in space management in the networked society?" "What is the necessity of learning space and research environment to ensure quality in higher academic institutions?"

2. Need of Concerns for Space Management in Indian University Libraries

Higher education institutions, including universities and colleges, in India are in need of guidelines and searching for appropriate modern standards for library space designing work and space management. We must have a platform to present, discuss, debate and promote concepts related to scientific space management in libraries.

Proportionate blending of teaching space (class rooms) and learning space (library and other learning areas) are required in institutions of higher learning and research. Librarians must not hesitate to put forward recommendations to improve the situation in higher education and research institutions in regard to their learning space.

In the present digital era, the concept of space in the library is more sophisticated and, sometimes, confusing. The future of the library as a physical 'place' has been a matter of considerable professional speculation and debate. Despite some hasty predictions about the imminence and inevitability of the virtual library, universities around the world continue to create new libraries for learning, teaching and research, often, as it happens, with growing printed collections. Libraries have not been replaced by ICT: rather the technology and technology-based services have moved into libraries (McDonald, Andrew. 2006).

3. Indian Scenario of University Libraries

According to UGC list of recognized universities (Dated- 27-12-2013), there are 656 universities in India. These total universities are classified under State Universities (311), Deemed to be Universities (129), Central Universities (45), and Private Universities (171), which together come to a total of 656.

- **Scope of New Concerns for Space Management:** Around 50% of the universities, in the UGC list which mentioned above, emerged within last two decades. This new generation universities are showing a special interest to spend resources to ensure quality of education and research. So they cannot avoid spending for library development. There must be a push, which will enable the institutions to become intensely aware of the realities of library space and content, which can boost quality of learning and research
- **A Quest for Quality:**All universities, colleges and research institutions are keen to accredit their status to a higher level. In view of getting a good grade, they may spend resources to upgrade their libraries that are presently considered as an important constituent that determine quality and relevance of education and research. This push has to help them in upgrading their institutions.
- **Role of Government and Non Government Organizations:** We don't have a useful and modern norms and standards for library space, function, services, collection etc. in India. The same time there is an enormous opportunities to develop the library in the right direction with the intention of quality research. The number of universities and their concern for library development are not bad. Unfortunately there is a floppiness in the process of policy making for the quality norms of the university libraries. This problem may be because of lack of awareness.

This unaware situation of Government organizations is giving an opportunity to the Non Government Organizations to crate proper attention to the mater by their actions and promotions like organizing national and international seminars, conferences, workshops etc.

In the international level the organizations like IFLA, ALA, AALA, Library Journal etc. are taking special interest for the Library Space Management. They are frequently conducting programmes i.e. international seminars, conferences, workshops etc. for the same. Some of this organizations have special wings to discuss and design the academic libraries. These organizations are regularly publishing good number of research materials on the library space management. Here I would like to note some of the efforts taken by the library professionals with the help of International Associations namely:

- Stewart , Christopher done a research and published with the title of The Academic Library Building in the Digital Age: A Study of New Library Construction and Planning, Design, and Use of New Library Space, from Chicago by American Library Association in 2010.
- Cribb, G. & Schmidt, J. published Online Space Displacing Physical Space in Libraries; the Impact of Online Use on the Transformation of Library Design. in 2011 from ALIA Information Online Conference & Exhibition.
- Leighton, Philip D., and Weber, David C. published a big reference book as Planning Academic and Research Library Buildings from Chicago: American Library Association. Because of huge demand in India a local edition was published at New Delhi: by Ess Ess Publications in 2010.
- IFLA promoted the popular concept of 'Ten Commandments' of planning libraries introduced by Faulkner-Brown, H. through good number of seminar by IFLA and there Section on Library Buildings and Equipment.
- Library Journal and School Library Journal of USA, together conducted an online event on October 16, 2013 namely The Digital Shift: Reinventing Libraries. This was their 4th annual online event. The Digital Shift: Reinventing Libraries was a thought-provoking discussions and actionable solutions to some of the biggest challenges libraries are facing today. There expert speakers and panellists were presented innovative ideas and actionable solutions for and from libraries. There 5th annual online event will be on October 4, 2014 (http://www.thedigitalshift.com/reinventinglibraries/program/).

In this article I mentioned some of the samples from the events, persons and associations which are committed to the promotion of library space management in the age of digital shift. This may be an inspiration for us to do something for our India with incredible potencies. The space management in Indian libraries must be unique. There is no room for exact imitation or coping. We have our own heritage and legacies in Library and Information Science, in Philosophy, in Learning Systems, in Culture, in Literature, in Environment, etc. So we have to seriously promote good amount of researches to reinvent the libraries in the age of digital shift.

4. Two Criteria for Reinventing the Library Space in the Age of Digital Shift

When we analyzed the present Indian scenario, we realized that the need of appropriate norms and standards for library space management in the age of digital shift. The government organization and the non government ionizations have to undertake this task and promote the persons, associations and events to realize this task with due consultations and deliberations. To do this work with proper vision I would like to focus on two criteria to formulate an integrated norms and sanders for the management of library space without ignoring the context.

- **Drastic Changes of Content:** The concept of library content is changing with unprecedented speed. This change creates a lot of challenges and confusion among librarians. There is no certainty regarding future existence of the traditional print media to store content. After a series of information explosions and predictions on a paperless society the production of print materials have not ceased. The scholars differ in opinion about the credibility of online information. The right information to the right person at the right time is still a far off dream even though technology is available. Issues of semantic web are high. The ICT applications and different technological adoptions are making many changes in the content area. Technological advances have had extensive

implications for space needs in academic libraries, either directly or indirectly (R.P.Holley 2013). Technology has a definite role in the management of research content. The technical fitness of library as well as the librarians is quite demanding. Research methods and retrieval techniques are dynamic because of the changes in the content.

- **New Trends in Library Space Management:** After drastic developments took place in the field of Information Technology, there have been major changes in the area of space management in libraries, particularly in university libraries. The past two decades have been a phase of important transition for academic library buildings as the libraries have tried to handle the impact of technology on their space.(R.P.Holley 2013). It was after 2000, the question about the purpose of the library and its physical space was revisited. (Childs, Sarah, Matthews, Graham & Walton, Graham. 2013)

The transformation of information acquiring systems and information accessing systems, due to growth in technology over the past two decades have led to the transformations and reshaping of academic library physical space and their services and collections (Stewart C. 2010). Negotiations and debates on how the balance between the traditional and modern library space in the light of those transformations are still happening among the scholars and library planners. These transformations are not static but on-going(Stewart C. 2010). The emergence of Internet as a vehicle for connectivity advances and delivery of scholarly information has changed the way the users use the library (R.P.Holley 2013).

Implementation of Information and Communication Technology (ICT) has taken place in most of the libraries in the world. Use of ICT has also helped university libraries to cope up with the challenges of information explosion (Israel G. I. 2010).Such technological growths are used as tools to improve the library services and functions. It should also be understood that these changes also resulted in continuous changes in the definition of space in libraries and has caused the library makers to rethink the traditional role of space in academic life. New library values and themes have also emerged. New concepts like non-library activities have brought changes in the way libraries function and are perceived. These transformations have made academic library buildings from being a teaching-based enterprise to learning-based enterprise (Stewart C. 2010). In other words, libraries can no more serve as a place that would guide and direct a person towards wisdom while it all depends on the users on how far they intend to go. This scenario has compelled academic libraries, which are always associated with complexity, authority and tradition, to re-evaluate their purpose and mission (Stewart C. 2010).

Deferent factors are there for proper space management in the university libraries. From the library and information science background we must know the conventional criteria for the library management, especially the space management in the libraries. The same time we have to consider some of the newly emerging phenomena. I would like to mention three important trends on library space designing and management. 1) Ten Commandments for Space Designing in Libraries 2) Concept of Learning Space 3) Increase in non-library activities housed in library

- **Ten Commandments for Space Designing in Libraries:**If we look at the world scenario we can see some suggestions, solutions and trends regarding the library space. Among these the 'ten commandments' known as more popular one. The challenges of planning academic libraries for tomorrow are very different from the seventies when Harry Faulkner-Brown, a well-established British architect responsible for designing many library buildings around the world, first elucidated some desirable qualities that became widely known as the 'ten commandments' of planning libraries (Faulkner-Brown, 1979; 1998; 1999). He (Faulkner-Brown) suggested a library should be flexible, compact, accessible, extendible, varied, organised, comfortable, constant in environment, secure, and economic. First discussed in the sixties, it is not surprising that some of the words now have rather different meanings and that emphases have changed considerably.(McDonald A. 2006). Then Mc Donald tried to redefine the commandments with some modifications. This modified format as flows: Functional (space that works well, looks good and lasts well); Adaptable (flexible space, the use of

which can easily be changed); Accessible (social space which is inviting, easy-to-use and promotes independence); Varied (with a choice of learning and research spaces and for different media); Interactive (well-organised space which promotes contact between users and services); Conducive (high-quality humane space which motivates and inspires people); Environmentally suitable (with appropriate conditions for readers, books and computers); Safe and secure (for people, collections, equipment, data and the building);Efficient (economic in space, staffing and running costs);Suitable for information technology (with flexible provision for users and staff) and Oomph (Bold space that captures the minds of users and the spirit of the university)(McDonald A. 2006).

- **Concept of Learning Space:** Learning place is not a novel idea. But the new research and learning culture is demanding deferent verities of learning requirements. This new requirements are creating new trends. In 2008 Jeffrey T. Gayton differentiated the social and the communal space within the library. Arguing that the new approaches to the library space are considering exclusively the social aspects, he advised against the possible loss of the traditional functions. For the author a social space is being constituted by activities like teamwork, informal communication and instruction; the communal space is an environment where people are studying in common but not together. The example is the traditional reading room where all users of the library are reading there materials in silence. The atmosphere gives them a feeling of affiliation to a community of learners. Gayton argues that the social activities are disrupting this communal atmosphere by making noise. (Eigenbrodt O. 2009). The transformation of information from a scarce to a superabundant commodity has driven three paradigms in the design of library space. These are the reader-centred, book-centred, and learning-centred paradigms. The first two competed inconclusively with one another throughout most of the twentieth century. Revolutionary changes in information technology have only recently made a third design paradigm possible, one focused on intentional (or autonomous) learning. This paradigm frees us from a schoolwork approach to learning and from mere trafficking of information. The challenge before us is to align library space design with the transformational character of intentional learning (Bennett, Scott. 2009).

- **Increase in non-library activities housed in library:** Non-library facilities refer to those facilities which were not part of the library in the past decades but became a part of the library in the recent times (Leighton, P. D., & Weber, D. C. 2010). These facilities are considered useful to the researchers, because these non-library activities are giving a feel of responsible belongingness, which promote transformational character of intentional learning at the library. Part of the new trends in library space, some of the commonly known non-library facilities are listed here. Among this list first eleven of them were from a book authored by Stewart, Christopher in 2010. The following are the important non-library activities which are slowly adopting to the library - "General computer lab(s); Snack bar or café; Classrooms for general use; Conference/meeting rooms; Auditorium; Tutoring centre; Archives; Bookstore; Photocopy/Xerox; Academic department(s); Art gallery or museum space" (Stewart, C. 2010); Exhibition area; Video watching room; Audio room; CD/DVD library; Multimedia centre; News watching facility; Writer's cabin; Incubator (Thinking Cell); Meditation/assimilation room.

5. Conclusion

India is blessed with 656 universities and thousands of autonomous colleges, research centres, research institutes and higher learning canters. Another beauty of India is it is a developing country. With these qualities we have to seriously think and plan for an excellent environment for enlightenment to enhance the quality research at libraries of research promoting institutions. We the library researchers and professionals have to design the library with the vision for the mission of building the knowledgeable society in the networked environment. To shape the knowledge with knowledge radiating environment (library) we have to do due home work in areas like concept level, practical level and personal level. When we mature enough to shoulder this responsibility we can enjoy our profession proudly as a librarian.

The grate awareness of responsibility of librarianship lead us to do a examination of conscience. Most of the institutions in India do not incorporate librarians in the processes of library planning, space designing and management. On most occasions librarians are replaced by engineers, architects and professors with highhandedness in library space planning and development. We have to create an awareness on the need for involvement of library and information science professionals in developing physical facilities and space for information storage, retrieval and dissemination functions.

Present-day curriculum of library and information science is very weak in equipping librarians with the knowledge of library planning, library space designing and library space management. Library science professional forum has to discuss this aspect and to put forward suggestions on revising the curriculum of library and information science courses, giving due importance to space design and management.

The official government bodies or organizations like UGC and NACC have to undertake the task to formulate and experiment an integrated norms and sanders for the management of library space in the universities and institutions of higher studies, without ignoring the context. The ministry of human resource and higher education must promote the persons, associations and events to implement this norms and sanders with due consultations and deliberations.

In short there are enormous amount of potency among the library researchers and library professionals. We have to plan properly to invest this capacities to actualize the goal of integral development. Here we have to balance the complexity with consciousness in the process of designing the libraries with excellent space management to design the knowledgeable society for a nation of grate enlightenment.

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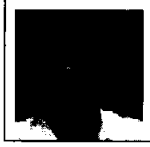
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Corporate Social Responsibility and Public Libraries: *The Road Ahead*

Pardeep Rai **Dharam Kumar**



The business houses contribute the finance, manpower and strategies for the welfare of the mass, since the ancient times and continued the same till today. In olden days this act was considered as the act of mercy or donation for the social cause. Nowadays, the Corporate Social Responsibility is seen in the changed pattern and the corporate undertake this job of social responsibility as a strategy to develop its brands and to mitigate the negative effects from the minds of consumers. The corporate own the responsibility for education, health, rural development, drinking water, and urban sanitation etc. The public libraries sector is one, which may be paid attention by the corporate under Corporate Social Responsibility programme. It would be equally beneficial to both, the corporate and the mass.



Public Libraries, Corporate Social Responsibility (CSR)

1. Introduction

The Corporate Social Responsibility (CSR) refers to the way that businesses are managed to bring about an overall positive impact on the communities, cultures, societies and environments in which they operate. The basic principle of Corporate Social Responsibility clearly says that not only public policies but even corporate should also be responsible to address the social issues. Thus it is a kind of partnership between state and corporate companies to deal with the challenges and issues of social welfare.

As compared with other countries, India has one of the richest traditions of CSR but still CSR in India is yet to receive widespread recognition. In his statement the Corporate Affairs Minister Mr. Sachin Pilot said that "religious contributions by Corporate should not be considered as Corporate Social Responsibility activity. According to the New Company Bill 2012, companies with net worth of Rs. 500 crore or more, a turnover of Rs. 1, 000/- crore or more or a net profit of Rs. 5 crore or more in a financial year are mandated to pay 2% of their profit towards CSR."

"A popular explanation of the term CSR is the continuing commitment by businesses to behave ethically and contribute to economic development, while improving the quality of life of the workforce and their families as well as of the local community and society at large. CSR is primarily a strategy to divert attention away from the negative social and environmental impacts of the life of the employees and people around the company".

2. CSR in India: Historical Perspective

The history of CSR in India has four phases though not so static and the features of each phase may overlap other phases also.

- **First Phase-** In this phase the charity and philanthropy were the main drives of CSR. In pre industrialisation period wealthy merchants shared a part of their wealth with wider society by way of setting up temples and getting over phases of famines and epidemics by providing food from their godown and money and thus securing integral position in society. In 19th century the Industrial families such as Tata, Bajaj, Modi etc. were strongly inclined towards economic as well as social considerations.
- **Second Phase-** The second phase in CSR is observed in India by the Principles of Trusteeship introduced by Mahatma Gandhi. According to that the industry leaders had to manage their wealth so

as to benefit the common man. Gandhi's influence put pressure on various industrialists to act towards building nation and its socio-economic development. According to Gandhi, Indian companies were supposed to be the temples of modern India. In this phase through CSR Gandhi's reforms were carried out to abolish un-touchability, encouragement of Women and rural development.

- **Third Phase-** In third phase the Public Sector Undertakings took place and the laws relating labour and environment were enforced and made this period as an era of command and control. The policy of Industrial Licensing, high taxes and restrictions on the private sector led to the corporate malpractices, resulting an enactment of legislation regarding corporate governance. Thus mixed economy of public and private sector could not give movement to the CSR as it was desired.
- **Fourth Phase-** The globalisation and economic liberalisation and relaxation in licensing system gave boost to the economy and Indian companies grew rapidly, thus they were more willing to contribute
- ***Current Scenario*** – Since it is not a new concept in India thus corporate like Tata, Birla etc. have been involved in CSR. These corporate are helping community through donations and charity events time to time. These days the CSR aims to maximise the company's overall impact on the society and stakeholders. The CSR policies, practices and programs are being integrated by an increasing number of companies throughout their business operations and processes. The mostly corporate feel that CSR is important for protecting the goodwill and reputation, defending attacks and increasing business competitiveness.

"CSR has gone through many phases in India. The ability to make a significant difference in the society and improve the overall quality of life has clearly been proven by the corporate. Not one but all corporate should try and bring about a change in the current social situation in India in order to have an effective and lasting solution to the social woes. Partnership between companies, NGOs and the government should be facilitated so that a combination of their skills such as expertise, strategic thinking, manpower and money to initiate extensive social change will put the socio-economic development of India on a fast track".

An insight into the history of CSR reveals that till 1990s it was solely dominated by the idea of philanthropy. Considering CSR as an act of philanthropy, businesses often restricted themselves to one time financial grant and did not commit their resources for such projects. Moreover, businesses never kept the stakeholder in mind while planning for such initiatives, thereby reducing the efficacy and efficiency of CSR initiatives. However, over the last few years, the concept of CSR has been changing. There has been an apparent transition from giving as an obligation or charity to giving as a strategy or responsibility. Review of the case studies and work done on CSR by companies in India suggests that the CSR is slowly moving away from charity and dependence and starting to build on empowerment and partnership. Nowadays corporate are treating CSR as a separate entity and devote attention to it. Most of the corporate have a vision and mission statements often at the corporate level or sometimes at the CSR level that drive their CSR initiative. Deliberations are made to choose specific issues and initiatives. It has been observed that the areas they choose somewhere relate to their core values. Companies today are increasingly sensitive about their social role. The companies not only concentrate on how they will position their product or how they will sell it but also they have a social strategy because they have started feeling that brands are built not only around good quality of the product; but also around emotions and values that people ascribe to those products. Today, CSR has been understood in terms of accountability where corporate are feeling that they are responsible for the impact their actions have on several stakeholders. They feel that the basic motive of CSR today is to increase the company's overall impact on the society and stakeholders.

Moving away from the traditional approach, corporate rather than following top to bottom mechanism are increasingly bearing stakeholders' perspectives in mind, thereby considering CSR as a comprehensive set of policies, practices and programmes that are integrated throughout the business operations. It can thus be deduced that radical transformation is happening with CSR practices across India. The changes happened at conceptual level where charity oriented approach is now being seen as a

stakeholder oriented approach and at implementation level where other important resources except finance are being dedicated. Several innovative programmes in thematic areas of public health, education, environment, microfinance and related areas are being developed. These programmes are developed bearing in mind the local cultural context and the needs of people. Apart from devoting funds, expertise in terms of knowledge and human resource is also allocated for successful implementation of these programmes. In a growing number of companies these processes are encouraged and rewarded by top management. The implementation of programmes through a trained resource makes a real difference in the community that has been chosen for implementation. The following are key focus areas being incorporated into business practices:

3. Partnership with NGOs and Government

There has been an increase in the number of corporate partnering with NGOs and the Government to ensure successful execution of initiatives.

- **Community development:** Most large companies either have their own foundations or contribute to other initiatives that directly support the community upliftment, notably in health, education, and agriculture.
- **Environmental management:** Environmental policies and programmes are now standard, and many companies have implemented the ISO 14 001 system throughout their businesses.
- **Workplace:** Growing out of a long-standing commitment to training and safety is a more recent emphasis on knowledge and employee well-being.

4. Public Libraries

Public Libraries arose worldwide along with growth in education, literacy and publications. Every country has its own public library history with the influential leaders. Monarchs, wealthy people, and philanthropists have all made a contribution to society in the form of public library development. In ancient India, the libraries were established by emperors, capitalists and scholars. The Nalanda University in Bihar, Taxxila and Vikramshila are the example of scholarly centers in India and there were good libraries in these places but only scholars were allowed to access the literary wealth of these libraries. The Muslim rulers gave new move to libraries and appointed scholars as librarians. The other notable libraries were established by Sawai Man Singh of Jaipur, Maharaja Ranjit Singh and Maharaja of Tanjaur. These royal patron libraries worked as private institutions and the admission was limited.

The development of public libraries in India is considered since 1808, as the Government of Bombay proposed to register libraries. During the first half of 19th century the three Presidency towns Bombay, Madras and Calcutta had public libraries. The establishment of public library at Calcutta is significant because later it was converted into National Library of India. After Independence the growth of Public libraries is considerably good but it is not equal to the academic and special libraries. According to the first census of India in 1951, only one third local governments maintained public libraries. These so called public libraries were reading rooms having few hundred books for reading in the premises.

In 1951, the UNESCO, in collaboration with Govt. Of India, founded Delhi Public Library as pilot project to adapt modern techniques to Indian conditions and to serve as a model public library for Asia. The involvement of Union government in the Delhi Public Library project further led to the enactment of public libraries acts and allotment of funds for public libraries in its Five Year plans. This act of Indian Government contributed improvement to the conditions of the public libraries in India.

The establishment of Raja Rammohun Roy Library Foundation is another step, which contributed growth and development of public libraries in general and rural libraries in particular. It provides financial assistance to public libraries in the form of matching grants to state central libraries, district central libraries

programmes related with health & Nutrition, Education, Environment, Community Development, Waste Management, Health, Poverty Reduction, HIV/AIDS, Child Mortality, Rural Development, Disaster Management and Gramin Suvidha Kendras for Information Dissemination.

Now this is the right time that the corporate houses may be asked to pay their attention towards the development of the public libraries throughout India under CSR programmes. The corporate house may adopt at least one library at the districts level in the particular state of their main establishment or operation. They may be also asked further to expand the network of public libraries at town and Gram Panchayat level in the same district. The co-operation by corporate world will ease the financial burden on state and central governments and the public libraries in India will get revival through fresh and regular input of money and trained working professionals to provide information services to the Indian mass.

The motto behind the development of public libraries is clear to make the corporate houses understand that it is only the information literate customer or mass who use the brands and push any industry or business house at top in the list of billionaires. Thus information literacy may be spread through life long informal education provided by public libraries having latest books, journals, audio - visual collection, equipments like TVs, computers and other ICT tools with trained library and technology professionals. Further, like schools and hospitals the public libraries are essential agency to cater the information needs of people in the society. Therefore, the development of public libraries is to be paid attention by the corporate for the welfare of the mass.

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Role of Libraries and Information Centre towards the Society

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In the age of information technology, modern society has various needs such as education, research, cultural advancement, information, spiritual and ideological pursuit, past time and recreation society as founded various institutions to serve these needs. Among all of them library and information centre occupies a prominent place in society. It play a very important role in supporting the educational and research activities , promoting culture, dissemination information, catering to the spiritual and ideological instincts in man and building up a value system for him providing recreation to the society. Library is the best place where one can continue education after completion of the formal education. The present article discussing about the role of Library and information Centre for towards the society.



Society, Library, Institution, Education, Research, Culture

1. Introduction

In modern society, every human activity is organized through institutions. Every major social task, whether economic performance or heath care , education or research business or industry is institutionalized, the protection of the environment of defence is today invariability entrusted to institution or organization .Libraries and other similar type of institutions are those that collect stock, process organize disseminate and distribute knowledge/ information record in documents.

Information and knowledge are so vital for all round human development; libraries and information centre that handle and manage knowledge and information are indeed individual. The modern age libraries play a very important role towards the society. Now a days the libraries disseminate wide range of knowledge which are required to attain intellectual heights. Real knowledge can gain only through the library and information centre. Library also provides formal education, guiding learners to search vast range of material available. The librararies are gradually recognized for their prominent service, and they are occupying prominent position in the society. Library is such types of institution to solve almost all types of needs of users.

Suppose you are a student of school, your primary task is the acquisition of knowledge prescribed for that level, and this will be mainly through oral communication from the teacher supplemented by the reading of a few prescribed text books. But in the library you are exposed to books that will give you knowledge, bring to surface your latent aesthetic talents, stimulate your intellect, inculcate value and learning skills in you, provide you with recreation and so on. Anyone can continue education in library after completion of formal education, for this purpose library is the best place, In this way library is a integral part of whole educational process. A library hand book can be valuable device in the effort to assist and instruct the library users.

2. Library and Education

Main objective of education towards the society

- Imparting the knowledge
- Inculcation of values
- Imparting of vocational skills

There are two types of education, System in our India formal education and non formal education. Formal education is the one that an individual attains by enrolling himself is and educational institution like a

school or a college or a university and through constant teacher student contacts. In non formal education there is no such institutional base for education, learner educate yourself through courses offered by distance education mode, with the help of self learning.

- **Education for illiterate:** Literacy is only means of education; the audio visual media, specially the video tape have made it possible for education to be brought to your door step. It is special responsibility of the public library to work for the education of the illiterate people in its community through such media .Time to time it has also organize programmes of oral communication for educating its illiterate clientele.
- **Education for working group:** The public library plays a contributory role for working group, through the reading book and he/ she will become informed and educated in their areas of work. And will be able to increase their work efficiency. This will lead to greater productivity, in this regards public libraries play a very important role for the society.
- **Education of physically Handicapped:** Government of India should take imitative for such type of reader. Appropriate learning and teaching materials are acquired by these types of institutions, such as books and other types of learning kits for the blind, in addition to other facilities .Library authority should take imitative of stocking these types of library materials and help these unfortunate persons

3. Library in Research

Every researcher needs to depend on pat knowledge, which is available from the libraries in various documents. The need of library resources is in fact the most incurrent times. There is continuous growth of published information. There is a spurt of research institution, universities and institution of higher education .More particularly, due to multi disciplinary research and seepage of literature into a variety of fields, there is an increasing demand for libraries to support and encourage research. It has been recognized that no research can be carried out without dept information .It is also well known fact that information is available in libraries. The libraries can help the researcher in the selection of topics of research by providing earlier work dine in his/her field.

"The library is the heart of all university's works; directly so, as regards its research work, and indirectly as regards its educational work, which derives its life from research work. Scientific research needs a library as well as its laboratories, while for humanistic research the library is booth library and laboratory in one."

University library all over the world have their own place of importance in the scheme of higher learning. Libraries are not only repositories of knowledge but also dispensers of such knowledge. Dr. D S Kothari, the Chairman of University Grant Commission, said "University libraries play a vital role in the development institution of higher learning. The University Grant Commission attaches great importance to the strengthening of library facilities in universities and colleges and their efficient administration .The commission has also been giving grants to institutions for books and journals construction of library building and appointment library staff"**2** One of the most remarkable and identifiable development in the history of higher education and libraries was the foundation of the INFLIBNET in 1991.Information and Library Network Centre is and autonomous Inter-State Centre of the UGC India .It is major national programme initiated by the UGC of India.INFLIBNET play a very important role for university libraries specially for research works for research scholars.

4. Library in Cultural Activities

The first cultural role of the library is that is preserves the cultural heritage of the human race as represented by the books and other documents holds. It has also a cultural role in two other senses. It should make available books which would bring to expression the creative talents of individuals and develop their faculties for aesthetic appreciation. It should also recognized cultural programmes like music, dances, drama, concerts, painting competitions for children, exhibition of painting etc. and thus enriches the cultural life of the community. These programmes primarily fall in the domain of public libraries.

5. Library in Disseminating Information

The Special Libraries Association describes special librarians as \information resource experts, who collect, analyze, evaluate, package and disseminate information to facilitate accurate decision-making in corporate, academic, and government settings."**3** Historically the astronomy librarian's role has been to gather and preserve, and to store and retrieve the organization's knowledge. We live today in an Information age that has been transformed by the World Wide Web. It has contributed to an increased demand for the librarian's skills ineffectively organizing and distributing this information. In their poster, Mining the web: How useful is the global public library?, the authors state, \Given the market forces which drive the Web | mainly entertainment and commercial advertising | the Web is ideally suited for dissemination of outreach-type information, and among professionals, for documentation and publications."**4** Librarians are natural candidates for playing a supportive role in public relations because of their experience promoting their own Libraries

6. Library in recreation and leisure

The healthy use of leisure is matter of great importance in community life so that leisure time is not devoted to negative and destructive activities .The library should cater to the recreational needs of its users by stocking books suited for purpose. Novel and other forms of literature works of art, popular magazines, books of travels, etc. are primarily books of recreation and they should have a place in every library. Besides libraries especially public libraries should organize programme of healthy recreation and entertainment like the performing arts musical concerts, etc.

7. Library in Religious and spiritual institutions

Books can divided into three categories – books of information, books of inspiration and books of recreation.Spritiual and religious books that propound ideological themes and other books of permanent value which may be described as classics are books of inspiration. They meet them the spiritual, religious and ideological needs of their readers. Every library should have a representative collection of books of this type to inspire people to high ideals in life and inculcate value in them.

8. Conclusion

Modern society has various needs such as education, research cultural advancement, information, spiritual and ideological pursuits, pastime and recreation. Society has founded various institutions to serve these needs. Among them library occupies a prominent place for the society. Now days library play an important role towards the society .Library has several documents and types of documents. Today we call them as learning resources facilities or media for knowledge transfer. We have them in form of books, magazines, journals, newspapers, radio, television, microfilm, micro-fiche, audio-tape, laser disk, compact disk, computer software, computer network, satellite system. Education is process of learning understanding, applying, and utilizing knowledge for betterment of oneself, other individuals and the society as whole. Library and Information centre helps to lead better quality of life. Library and Information Centre act as harbingers of this knowledge gathering and disseminating information to all play for thinking. They provide various mechanisms for acquiring, and become a platform for conducting self education. Libraries particularly academic libraries, are centers for self education and self learning.
In the last on the above ground we can say Library and Information Centre play a very crucial role towards the society.

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Disaster Management Approaches for Libraries: *an issue not to be Neglected in India*

Mange Ram

Abstract

The present paper highlights the disaster and its management in general and in libraries in electronic age. The paper also suggested the management methods of disaster in libraries. Libraries are the custodian of our history, culture and civilization. They are keeping the heritage of the nation in safe for last thousands of years. The safeguard against disaster for the libraries is very important. Safeguard should be in such planned ways that save the resources of library without any damage. In India libraries are not concentrating on disaster management due to unawareness and paucity of funds. Libraries and reputed Information Centres should organise program on disaster management in libraries. There should be training and workshop program for library personnel as well as for library users. Library and managing authority should make necessary arrangement for the effective program of disaster management in libraries. Disaster management program should be implemented from the initial stage (from the construction of building for any organisation).

Disaster, Disaster Management, Natural Disaster, Man-Made Disaster, Disaster Management – Libraries, Artificial Disaster

1. Introduction

Now libraries of India transforming themselves from traditional library to modern library or we may say automated, electronic, digital, virtual or hybrid libraries. With the development of technology changes, the development of adversity also increased. Adversity or disaster may be natural an artificial also. Disaster and its management (Disaster Management) now becomes the burning topic in many field due to natural disaster as cyclone, tornado, earthquake, fire due to heavy rain, water flood etc. and artificial disaster as power grid failure, network failure, fire, server fail, short -circuit etc. In libraries, authorities and libraries are not giving their attention for management of any kind of disaster. In India except some advance libraries, most of libraries have no prearrangement for disaster. Libraries have our history. Civilization and culture in books and in electronic form, if any disaster occurred they will lose valuable history, Civilization and culture.

2. Disaster

Disaster is an unexpected, disastrous happening carrying excessive mutilation, damage, and destruction and devastation to life and property. The mutilation caused by disasters is incalculable and differs with the topographical location, climate and the type of the earth surface/degree of susceptibility. These effects may be mental, socio-economic, political and cultural state of the affected area. Disaster may be men made (Artificial) and natural. Some definition of disaster as follow:

An occurrence causing widespread destruction and distress; a catastrophe. Emergency "A serious situation or occurrence that happens unexpectedly and demands immediate action." (American Heritage Dictionary. 3 rd. ed., 1996) In contemporary academia, disasters are seen as the effect of hazards on vulnerable areas. Hazards that occur in areas with low vulnerability do not result in a disaster; as is the case in uninhabited regions. (Quarantelli 1998)

A **disaster** is a natural or man-made (or technological) hazard resulting in an event of substantial extent causing significant physical damage or destruction, loss of life, or drastic change to the environment. A disaster can be extensively defined as any tragic event stemming from events such as earthquakes, floods,

catastrophic accidents, fires, or explosions. It is a phenomenon that can cause damage to life and property and destroy the economic, social and cultural life of people.

2.1 Natural Disaster

A natural disaster is an implication when a natural danger touches creatures and/or the built atmosphere. The resulting damage is governed by on the capacity of the population to support or fight the disaster: their resilience. This understanding is concentrated in the formulation: "disasters occur when hazards meet defencelessness". A natural danger will hereafter never result in a natural disaster in areas without exposure. Numerous singularities like, landslides, earthquakes, eruptions, volcanic, cyclones and floods are all natural hazards that kill thousands of people and destroy moneys of territory and goods every time. Followings are the main natural disasters:

- Earthquakes
- Floods
- Volcanic eruptions
- Cyclones
- Biological agents (micro-organisms, insect or vermin infestation)
- Fires (wildfires)
- Rain

2.2. Artificial (Men Made) Disaster

With the technological development the hazards also grows. Artificial disasters also can be caused by humans. Dangerous materials emergencies include chemical tumbles and groundwater pollution. Workplace fires (caused by short-circuit etc.) are more common and can originate substantial property mutilation and loss of life. Communities are also defenceless to these threats posed by fanatical groups who use ferocity against both people and property.

In Artificial disaster, targets may include military and civilian government facilities, international airports, high-profile landmarks and large cities. In Cyber-terrorism involves attacks against computers (server down, virus attack, hacking and unauthorised access etc.) and networks done to intimidate or pressure a government or its people for political or social objectives.

3. Disaster management

It is a discipline that includes making, holdup, and rebuilding society when natural or human-made disasters occur. In general, any Crisis management is the unceasing process by which all individuals, groups, and communities manage hazards in an effort to avoid or perfect the impact of disasters resulting from the hazards. 'Disaster management can be defined as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters.

4. Disaster in Libraries

Disaster either natural or manmade may occur in any organisation and at any place of the world. Its seriousness may be distinguished on preventive, pre-arrangement and other security methods. Now, libraries have entered in the age of electronic age but with the advent of technology in libraries, the technological (Artificial) disaster has also generated. Natural disaster like flooding, earthquake, cyclones, rain and Volcanic eruptions etc. are identical and not changed but going toward uncertainty due to global warming. Day to day man-made disaster as power cuts, network failure, cooling- heating, theft of books, network tower failure,

conflict, noise, and violence may occur in libraries. Besides these, fire, sever failure, crashing of computer also are major disaster in libraries. Sometimes some misshaping may convert in major disaster in libraries.

5. Disaster Management in Libraries

Libraries are our guardian or custodian of our history, culture and civilization. They are keeping these records in printed and non-printed document. Students, scholar expectation are also linked with libraries. So maintenance and security of libraries are essential from disaster etc.

In this concern Indian libraries (especially government and public libraries) frustrated us. Libraries are not so secured in this concern. Most of the libraries have not installed fire alarm system in their libraries. If installed, the maintenance of these systems is zero, only they became show peace. Libraries are also faces many day to day disaster like power-cuts (No having generators), no heating-cooling system etc. Libraries are information centre are also organising many workshop, conference and seminar of ICT but neglected the topic like disaster management in libraries. This is ill-fated of Libraries as they are providing reading material (books, journals and encyclopaedias etc.) on disaster management to their users for research but for them, there is no such perpetual program in this concern. Funds are also a barrier in this concern as libraries not getting adequate funds for purchase books etc. and these disasters are the secondary phase for the libraries. I personally observed in many libraries that there was no such preventive equipment and measurement for this disaster (natural and man-made). Disaster controlling plan is a must be assimilated in preliminary planning of founding a library and information centre. Numerous minor pointers for a complete disaster management plan, which are independent of each other but are interwoven. Libraries either academic or public and authority (Government- Non-Government) should make the following provision in their libraries against disaster management:

- **Fruitful Plan**: Each disaster has three phases: before, during and after. A variability of plans is required to manage with each of these phases. There should be fruitful plan for disaster management. Disaster plan must cover complete of the library and information centre including staff, readers, sources of information, equipment and infrastructure and it must be a cooperative team effort.
- **Mirror Server/ Backup:** There should be arrangement of mirror server and daily backup of work should be taken on regular base by the competent library staff. Data backup should not kept in library and be placed at minimum two places. A responsible staff may take this backup with them. AMC of library server and UPC may be an alternative security measure for this.
- **Power Supply:** There should be one main switch of light system of library and place to place MCV- Light controller should be installed in the library to avoid short-circuit in light system.
- **Responsibility:** There should be fixation of responsibilities on staff and suitable should be identified and succession should be fixed in written and verbally. Suitable senior and junior staff should be incorporated in disaster planning.
- **Power-Cuts**: There should be installation of Solar Power System and UPS to cater the the uninterrupted power supply. Sound proof power generator may be installed for this system.
- **Fire:** Fire alarm system and smoke detector should be installed in library on each level so that any type of smoke and fire is detected. The staff training is essential to handle such system and should openings for staff to be alert of what is expected of them in the event of disaster. Library should identifying imperative parts of the building, collections, allocating rescue primacies, recognizing substitute storage sites, providing satisfactory fire protection.
- **Additional Funds Arrangement**: There should be an additional fund arrangement to procure the preventive equipment and for making such disaster arrangement in libraries.

- **Rain- Floods**: It is impartial as important to determine where the water is coming from and should to stop it at its cause as it is to cover up the books. There should be arrangement of water security out system around the library. The access of water should go in direct to down to earth.
- **User Awareness Program**: There should be a user awareness program regarding the disaster management. This program may be included in user education/ orientation program of the library.
- **Workshop/Training and Conference**: Time to time library and information centers should organize training and workshop program on disaster management in libraries.
- **Disaster Management Agency:** Library and information centers may hire Disaster Management Agency for disaster management. Library may contract with such type of agency (Government and Private). There are many such types of agencies are available (online – offline) for disaster management.

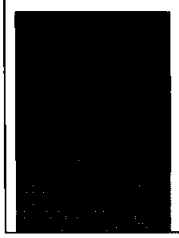
6. Conclusion

Now the range of disaster has increased, natural disaster is increasing due to global warming and artificial disasters (man-made) are increasing with the advent of Information Communication Technology. Pre-planning for disaster is very important as this management is inter-linked on each other. These planning should be implemented from the initial phase (from the point of construction of building of any organisation like libraries). Time to time mock drill should also implement for testing of the program. Maintenance of such procedure is also very important. Government, non-government and managing authorities should also pay more attention on this issue. Government should also make such positive policies for libraries and information regarding the implementation of disaster management.

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A Study on Library Webpages of IITs in India

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In this study reveals the library websites/webpage of IIT's in India. The study carried out the information available on the library homepages like features of the libraries, currency of the information, language options of the websites and general information of the libraries, available resources of the libraries of IIT's in India. The studied data, findings presented in a tabulated form also mentioned the suggestions and conclusion.



websites, Homepage, information, libraries, IIT

1. Introduction

In the introduction of the websites or webpage in the web world even a small organisations also creating websites for their official or business development, and contributing their information content and recognizing their identity in the web environment. Use of the on line information increasing rapidly new generations depends online for their not only scholarly information but also academic. In this changing environment state academic Libraries in India also moving towards offering their services and information through their websites. In the context of libraries website is a suitable tool for their exposing information. So study of the content of IIT library websites is necessary for their development and understanding of their features and also useful to the improvement and give suggestion and recommendation to the libraries.

The Indian Institutes of Technology (IITs) is a group of autonomous engineering and management institutes of India. The IITs are governed by the Institutes of Technology Act, 1961 these public engineering colleges are "institutions of national importance", The Institutes of Technology Act, 1961 lists sixteen institutes located at Bhubaneswar, Chennai, Delhi, Gandhinagar, Guwahati, Hyderabad, Indore, Jodhpur, Kanpur, Kharagpur, Mandi, Mumbai, Patna, Ropar, Roorkee and Varanasi. Each IIT is an autonomous institution, linked to the others through a common IIT Council, which oversees their administration. The IITs award degrees starting from B.Tech to Ph.D.

2. Objective of the study

The main aim of the study was to analysis the content of library websites/webpage of IIT's in India as following objectives.

- To identify and classify the domain of library website/webpage of the IIT's in India.
- To study the content available on the library Homepage.
- Data analysis and interpretation.

3. Methodology

The criteria suggested by Nielson and Tahir were used usability features of 80 university library websties(Nielson,2004), Vande Creek studied strength and weakness of library websites of Northern Illinois University by using trilateral approach(Vande Creek,2005). McGillis & Toms (2001) have assessed the usability of an academic library web site and suggests that web designer considered user-centered-approach. Based upon the detailed literature survey related to content analysis of website the author designed criteria the content of IIT library websites have been evaluated. Each library Homepage was independently accessed and llected data during the month of January, 2014.

The data collected from 16 IITs library Homepages through direct access to identify the selected features either presence or absence. The collected data are indicated simple coding excel sheet designed for this study.

4. Scope and Limitations

From the list of it's the apex institutions of engineering in India indicated in the MHRD (http://mhrd.gov.in/itt_higher_english) are considered for this study. According to the MHRD website 16 IITs are in India. For this study purpose all the 16 IITs are taken.

The study is confined to examine the contents of the IITs library websites or library Homepage (is part of the IITs website or direct URL for library) are considered for this study. The study only selected feature is presence or absence in the library Homepage.

5. Analysis and Interpretation of Data

The collected data on this study were analyses, interpreted, presented in the following tables.

- **Domain classification of websites**

Table 01 on this study reveals that all the 16 IITs are identified and classify its domain extensions. All of the (16) IITs websites have .ac.in (100 %) extensions.

Table 01- Classification of website domain

S.No.	Website domain	No. of sites, n=16	percentage
01	.ac.in	16	100%

- **Language option**

Table 02 Indicates the language option available for accessing the website. Out of 16 library websites 13 websites provided information only in English, two (12.5%) of the websites have providing both English and Hindi languages, one (6.25%) of the websites IIT, Hyderabad providing English, select language option.

Table 2 - Language option

S.No.	Language option	No.of sites, n=16	percentage
01	English	13	81.25%
02	English and Hindi	02	12.5%
03	English and Select language option	01	6.25%

- **Website appearance**

Table 3 indicates the appearance of the website at the time of accessing. Out of 16 library websites 12 websites provided page title(Library), 14 of the websites have providing audio/video/ photos, 11 websites providing Home link,14 of the websites using graphics (symbols, signs, gif images)all the 14 websites providing multicoloured 16 websites are legible fonts size and colour also.

Table 3 - Website appearance

S.No.	Features	No. of sites n=16	percentage
01	Page title (Library)	12	75%
02	Use of graphics(symbols, signs, images)	14	87%
03	Audio/Video/photos	14	87%
04	Scrolling text	06	37.5%
05	Home link	11	68.75%
06	Multicoloured	14	87%
07	Font size legible	16	100%

- **Library General Information**

Table 4 indicates the library general information. Out of 16 library websites 100% of the websites provided library introduction, 56.25% of the websites have providing library services, 75% of the websites providing library collection,56.25% of the websites provided rules, regulations & policies, 68.75% of websites providing various library Forms. No one was maintaining Library Annual Report.

Table 4 - Library General Information

S.No.	Features	No. of sites n=16	percentage
01	Library Introduction	16	100%
02	Library services	09	56.25%
03	Library collection	12	75%
04	Rules & Regulation/Policies	09	56.25%
05	Library Committee	02	12.5%
06	Library Hours	04	25%
07	Library usage tutorial	04	25%
08	News letter	01	6.25%
09	Annual Report	00	0
10	FAQ	05	31.25%
11	Ask to Librarian	05	31.25%
12	Library Staff	08	50%
13	Membership form/details	11	68.75%
14	Search options	04	25%
15	Site map/index	01	6.25%

- **Library Resources**

Table 5 indicates the library resources. Out of 16 library websites 12 websites provided OPAC & Databases, 68.75% of the websites have providing Link to E-Journal /Magazines, & 37.5% of the websites providing Institutional Repositories.

Table 5 - Library Resources

S.No.	Features	No. of sites n=16	percentage
01	OPAC	12	75
02	Reference sources (Dictionaries/Encycl.,)	05	31.25
03	Databases	12	75
04	Link to e-Journals/Magazines	11	68.75
05	Link to e-Books	12	75
06	DVD/CD's/Cassettes	11	68.75
07	List of Journals/Magazines	14	87
08	Digital Library	05	31.25
09	Institutional Repositories	06	37.5

- **Currency of the Information**

Table 06 shows the currency of the information, 68.75% of the library websites has mentioned copyright information in the library homepage. 37.5% of the library websites have mentioned the last update of the webpage in their websites.

Table 06 - Currency of the information

S.No.	Feature	No. of sites n=16	percentage
01	Copyright information	11	68.75%
02	Website last update	06	37.5%

6. Findings

These studies will help in determining the content and quality of the website in bring about the particular task of the website.

- Majority 100% of the libraries mentioned the about the library/library introduction in their websites
- IIT Guwahati and IIT Patna have only one webpage for library and mentioned only few lines.
- Very less information uploaded in these two IIT library webpages.
- 68-75% of the libraries provided Link to e-journals/magazines and e-books. These libraries are preferring e-resources.
- Web 2.0/3.0 features are found in 9 library pages
- 75% of the libraries provided the database in their library page
- 56.25% of library pages mentioned the library services
- 75% of library pages mentioned the library collection

7. Suggestions and Conclusions

The study found that all the library webpages of the IITs in India have not preferred separate website/separate URL for their libraries, and there is no advance features and services of libraries in the websites, and also need e-discussion with the librarian and library professional for their collection, email alerts/news alerts are not found in their websites bottom line or right corner need the web2.0/web3.0 features in their library websites, few of the libraries have mentioned librarian and library staff details few of the library webpages are updated with their information and two IIT libraries especially Guwahati and Patna are created webpages only for nominal way not series about the uploading the information maintenance of the library webpage due to their lack of knowledge on web otherwise lack of attention, lack of interest, otherwise lack of strong experienced knowledgeable, leadership librarian etc., so the young blood is needed in the libraries of IITs . Internet can changed many aspects in the world, it is tedious to go to library it is easy to trace the information on internet, new generations very much depend on the e-resources so libraries also changing information environment understanding the user preferences to cater the net savvy users. also there are not updated their information and updated information in not found their library pages it will create misunderstanding the library quote the right information to the right person at right time in right way.

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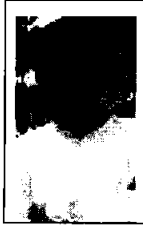
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Annexure 1

List of libraries of IITs and their URL

S.No	Name of the IIT	URL
1	IIT Bhubaneswar	www.iitbbs.ac.in
2	IIT Bombay	www.iitb.ac.in
3	IIT Delhi	www.iitd.ac.in
4	IIT Gandhinagar	www.iitgn.ac.in
5	IIT Guwahati	www.iitg.ac.in
6	IIT Hyderabad	www.iith.ac.in
7	IIT Indore	www.iiti.ac.in
8	IIT Jodhpur	www.iitj.ac.in
9	IIT Kanpur	www.iitk.ac.in
10	IIT Kharagpur	www.iitkgp.ac.in
11	IIT Madras	www.iitm.ac.in
12	IIT Mandi	www.iitmandi.ac.in
13	IIT Patna	www.iitp.ac.in
14	IIT Roorkee	www.iitr.ac.in
15	IIT Ropar	www.iitrpr.ac.in
16	IIT (BHU) Varanasi	www.iitbhu.ac.in

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Information and Communication Technology Competency of Library and Information Science Students in Kerala

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Abstract

This study aims to determine the Information and Communication Technology (ICT) competency of the Library and Information Science students in the Universities in Kerala. A structured questionnaire was used to collect data from the students and Microsoft Excel was used for data analysis. The study reveals that most of the students have to undergone high level ICT education to improve their ICT competency. The use of ICT based resources and services, library automation and digital library software is moderate among the students. But the use of general purpose application software is very high among the students. The use of subject databases and content management software is very low among the students. Majority of the students had confidence in routine ICT and internet tasks and they need training and exposure to high level ICT tasks.

Information and Communication Technology, ICT skills, ICT Competency, ICT Literacy, Information Literacy, Library and Information Science students.

1. Introduction

Information and Communication Technology (ICT) is considered as the building blocks of the modern educational and knowledge society. It plays a vital role in the higher educational system in India. ICT refers to the range of technologies that are applied in the process of collecting, storing, editing, retrieving, and transfer of information in various forms (Olakulehin, 2007). This broad definition of ICT includes such technologies as radio, television, video, DVD, telephone, satellite systems, and computer and network hardware and software, as well as the equipment and services associated with these technologies, such as videoconferencing, e-mail and blogs (UNESCO, 2007).

All over the world, the higher education centers are grappling with how to incorporate themselves to cope with the new challenges and opportunities posed by ICT. In a developing nation like India, the ICT competencies are very much important for those who want to enter into a rising employment market. Besides that, the increased use of ICT in higher education the students need to excel in ICT competencies and skills to learn effectively.

According to UNESCO the successful integration of ICT into the classroom will depend on the ability of teachers to structure the learning environment in new ways, to merge new technology with a new pedagogy, to develop socially active classrooms, encouraging co-operative interaction, collaborative learning and group work. This requires a different set of classroom management skills. The teaching skills of the future will include the ability to develop innovative ways of using technology to enhance the learning environment, and to encourage technology literacy, knowledge deepening and knowledge creation (UNESCO, 2011).

- **ICT Competency:** A recent study showed that (Bembridge, Levett-jones, and Jeong, 2011) the transferability of ICT competency from university to the work place is impacted by a range of educational, individual, organizational and contextual factors. In another study, Hosein, Ramanau and Jones (2010) concluded that frequency of using ICT was related to student's perceived competence in the tool. These results might have an impact on the repurposing of living technologies for use as learning technologies. Levett-Jones's et al. (2009) study showed that, the students were resistant to the use of ICT as an educational methodology and lacked the requisite skills and confidence to engage successfully with this educational approach.

Al-Daihani, (2011) conducted a study to describe ICT education in Library and Information Science programs. It is found that the participants showed dissatisfaction with the currently available ICT courses in the LIS programs. Students pointed out deficiencies and inadequacies in ICT resources and facilities, and suggested upgrading software and hardware.

In this changing scenario of educational system, the librarians must play a vital role in managing electronic information in an effective way. But a study conducted by Nath, Bahl and Kumar (2007) showed that a low level of ICT knowledge amongst librarians and a general lack of formal training for ICTs amongst the academic librarians. A study about the ICT literacy among the library professionals reveals that the professional assistants are more ICT literates than the junior librarians and Assistant Librarians. The use of digital library and institutional repository software is very low among the library professionals (Haneefa and Shukkor, 2010).

2. Perception, Awareness & Attitude towards ICT

A most recent study about the perception and attitudes towards ICT revealed that majority of the students possessing a positive attitude towards ICT (Mohamed, Aik, Yi, Abdullah and Dom, 2011). It becomes imperative that students should be equipped with digital literacy competencies in order to exploit information resources that the electronic age produces. School leavers may not possess the necessary computer skills for their university education although they have been using electronic devices frequently (Nash, 2009).

In fact, there is an urgent need for ICT training to be given to fresh university students in order to obtain successful learning outcomes from the use of ICT and to satisfy the needs of their future employers. The most important ICT training needs should include skills development to assist ICT teaching and learning approaches for subject specific areas of specialization; maintenance training; research oriented training on ICT use for data analysis; spread sheets; and programs.

The ICT awareness programs significantly enhance students' computer and internet self-efficacy and their positive attitudes towards computers and the internet, while significantly reducing their computer anxiety (Papastergious, 2010). A recent survey showed that ICT literacy among teachers in higher educational sector in India is very low (Sinha, 2008). A developing country like India must have ICT literate teachers in order to provide young dynamic students with high quality ICT awareness. The successful integration of ICT into the classroom will depend on the ability of teachers to structure the learning environment in new ways, to merge new technology with a new pedagogy, to develop socially active classrooms, encouraging co-operative interaction, collaborative learning and group work.

Education has largely contributed to an increase in developing knowledge, providing an enabling environment for innovation and in building human capital required for a potential future knowledge economy. Global reforms in education and challenging ICT demands have made a remarkable shift in the structure of the enabling ICT environment and the utilization of ICT technologies in education. Such technologies have become the key driver of the digital network in an era of technology-driven education. More schools and communities now have access to ICT resources to join the global economy with knowledge workers who have 21st century skills and are inspired by life-long learning. Similar efforts exist around the world, which also aim at advancing education for better literacy. This community of expertise in "ICTs in Education" is intended as a contribution to bring together scientists, public authorities, businesses, academics, civil society organizations and other interested groups and students to understand challenges for sustainable education in the global context; identify the potential of ICT to advance and improve education; share knowledge and best practices about successful policies in global education; create venues of collaboration; and consolidate responsible communities for more access to ICT resources of knowledge and content.

Information and Communication Technology is an important element for the effectiveness of educational system. ICT resources and services help the users or students for improving high-level information handling skills, to have through knowledge in the new methods and technologies, problem solving and decision making. The purpose of the study was to explore the ICT competence of the Library and Information Science students in Kerala.

3. Research Design

The universe of the study was the Library and Information Science students in the Universities in Kerala. A structured questionnaire was used to collect data from the students of Departments of Library and Information Science of the University of Kerala, Mahatma Gandhi University (M.G University), University of Calicut and Kannur University. There were 194 regular students in these Departments, which include 42 (21.6 per cent) students from the University of Kerala, 47 (14.2 per cent) students from the University of Calicut, 68 (35.1 per cent) students from the Mahatma Gandhi University and 37 (19.1 per cent) students from the Kannur University. Data were collected from all the students and analysed and interpreted statistically.

4. Results and Discussions

- **Computer Literacy:** The introduction of technology in the delivery of education is becoming of paramount importance to institutions in India. The teaching of computer literacy to all students is of increasing importance as the dramatic increase in the use of the computer has come to the point that its use for a range of learning tasks is now a basic learning skill, as much as taking notes or reading texts. The students were asked to indicate their computer literacy and it was found that a large majority (92.8 per cent) of the students are computer literates, while a very few (7.2 per cent) students responded negatively.

- **Computer Education Possessed by the Students:** The application of modern ICT in the construction of educational paradigms has irrevocably changed the way in which the teaching, learning and evaluation of Library and Information Science are done in this century. ICT is seen as the electricity of the information age and its access to Library and Information Science education as a key to the process of development. The rapid advances being made in ICT, particularly in the Internet, have very important implications for education, educators and learners. Table 1 depicts the status of computer education possessed by the Library and Information Science Students in Kerala. The analysis shows that a majority of the students (61.3 per cent) have undergone short term courses. Very few students have undergone DCA course (23.7 per cent), PGDCA course (4.6 per cent) and other courses (3.1 per cent), which include DCFA, CTTC, and MCFA.

Table 1 - Computer Education Possessed by the Students

Sl. No.	Computer Courses	Responses (N=194)
1	Short term	119(61.3%)
2	DCA	46(23.7%)
3	PGDCA	9(4.6%)
4	Others	6(3.1%)
5	Nil	14(7.2%)

- **Use of Information and Communication Technology Tools/Devices/Utilities:** Technology changes rapidly and so do the specific tools available for education. As new technologies are introduced, it is critical that their cost and impact in various educational situations is thoroughly examined. While evidence shows that it is the actual application of the ICT tool that is the most important determinant of its effectiveness for educational purposes, the choice of tools is quite large, and each tool has its own advantages and disadvantages.

Students were asked to indicate their use of the ICT tools/devices/utilities and the responses are summarized in the table 2. The analysis shows that most (98.5 per cent) of the students use DVD which include, frequently (48.5 per cent), rarely (19.1 per cent), occasionally (30.9 per cent) and very few (1.5 per cent) of them have not used it. Large majority of them use CD-ROM (93.3 per cent) and Laptop (85.1 per cent). Majority of them use Printer (77.3 per cent) which include, frequently (24.3 per cent), rarely (27.0 per cent), and occasionally (32.4 per cent) and very few (16.2 per cent) of them have not used it yet. Majority use Scanner (60.3 per cent) and Ipad (56.0 per cent). Few of them use Smartcard (32.5 per cent) and very few of them use Fax (21.65 per cent).

Table 2 - Use of ICT Tools/Devices by Students

Sl. No.	ICT Tools/ Devices	Responses				
		Frequently	Rarely	Occasionally	Not Yet used	Total
1	CD-ROM	89 (45.9%)	35 (18.0%)	57 (29.4%)	13 (6.7%)	181 (93.3%)
2	DVD	94 (48.5%)	37 (19.1%)	60 (30.9%)	3 (1.5%)	191 (98.5%)
3	Printer	30 (15.5%)	62 (32.0%)	58 (30.0%)	44(23.0%)	150 (77.3%)
4	Scanner	10 (5.2%)	42 (21.6%)	65 (33.5%)	77(40.0%)	117 (60.3%)
5	Smart card	8 (4.1%)	21 (10.8%)	34 (17.5%)	131(67.5%)	63 (32.5%)
6	Laptop	94 (48.5%)	29 (14.9%)	42 (21.6%)	29 (14.9%)	165 (85.1%)
7	Fax	12 (6.2%)	15 (7.7%)	15 (7.7%)	152 (78.4%)	42 (21.65%)
8	Pen drive	96 (49.5%)	45 (23.2%)	31 (16.0%)	22 (11.3%)	172(89.0%)
9	I pad	19 (10.0%)	49 (25.3%)	40 (20.6%)	86 (44.3%)	108 (56.0%)

- **Use of Information and Communication Technology Services:** ICT has changed the traditional methods of library activities and services providing new dimensions for learning and research in higher educational institutions. With the help of ICT services, it is possible to search, retrieve, disseminate and organize information by creating websites and databases. Students were asked whether they use any of the ICT services and the responses are summarized in the table 3.

Table 3 - Use of Information and Communication Technology Services

Sl. No.	ICT Services	Responses				
		Frequently	Rarely	Occasionally	Not Yet used	Total
1	E-mail	124(63.9%)	38(19.6%)	29(14.9%)	3(1.5%)	191(98.5%)
2	E-book	21(10.8%)	46(23.7%)	45(23.2%)	92(47.4%)	102(52.6%)
3	E-Journals	72(37.1%)	55(28.4%)	53(27.3%)	14(7.2%)	180(92.8%)
4	Database	46(23.7%)	34(17.5%)	55(28.4%)	59(30.4%)	135(69.6%)
5	WWW	90(46.4%)	62(32.0%)	30(15.5%)	12(6.2%)	182(93.8%)
6	FTP	16(8.2%)	28(14.4%)	28(14.4%)	123(63.4%)	71(36.6%)
7	Social Networking Sites	86(44.3%)	33(17.0%)	53(27.3%)	18(9.3%)	176(90.7%)
8	Mailing List	50(25.8%)	45(23.1%)	68(35.1%)	31(16.0%)	163(84.0%)
9	Search engines	98(50.5%)	38(19.6%)	50(25.8%)	8(4.1%)	186(95.9%)
10	Chatting	49(25.3%)	57(29.4%)	48(24.7%)	40(20.6%)	154(79.4%)
11	OPAC/WebOPAC	93(47.9%)	49(25.3%)	33(17.0%)	19(20.2%)	175(90.2%)
12	Video sharing	16(8.2%)	66(34.0%)	58(29.9%)	54(27.8%)	140(72.2%)
13	Audio sharing	17(8.8%)	65(33.5%)	50(25.8%)	62(32.0%)	132(68.0%)
14	Book marking	9(4.6%)	39(20.1%)	26(13.4%)	120(61.9%)	74(38.1%)
15	Video conferencing	7(3.6%)	43(1.5%)	56(28.9%)	88(45.4%)	106(54.6%)
16	Blogs	15(7.7%)	49(25.3%)	49(25.3%)	81(86.2%)	113(58.2%)
17	RSS	6(3.1%)	35(18.0%)	32(16.5%)	121(62.4%)	73(37.6%)

The analysis shows that most of the students use E-mail (98.5 per cent), and Search engines (95.9 per cent) of which majority (63.9 per cent) of them use E-mail frequently, very few of them (19.6 per cent) use rarely and occasionally(14.9 per cent). Approximately half (50.5 per cent) of them uses Search engines frequently, few (25.8 per cent) of them use occasionally and very few (19.6 per cent) of them use rarely. Large majority of the students use WWW (93.8 per cent), E-Journals (92.8 per cent), Social Networking Sites (90.7 per cent), OPAC/Web OPAC (90.2 per cent) and Mailing list (84.0 per cent), majority (79.4 per cent) of them use Chatting, Video sharing (72.2 per cent), Database (69.6 per cent), Audio sharing (68.0 per cent), Blogs (58.2 per cent), Video conferencing (54.6 per cent), and E-Book (52.6 per cent). A good number of them use Book marking (38.1 per cent), RSS (37.6 per cent) and FTP (36.6 per cent).

- **Use of Software:** Computers and Information Technologies are the integral part of our life. A number of services provided by the libraries are in electronic or digital form. So the Library and Information Science Students should be well aware of these software and technologies. This portion analyses the students' use of different types of software.

- **Use of Application Software:** Application software is a defined subclass of computer software that employs the capabilities of a computer directly to a task that the user wishes to perform. The students were asked to indicate their use of different application software and the responses are summarized in the table 4. The analysis shows that, most (97.9 per cent) of the students use MSWord. A Large majority (90.7 per cent) of them use Microsoft Excel and Power point (82.5 per cent). A good number (41.2 per cent) of the students use Photoshop.

Table 4 - Use of Application Software

Sl. No.	Application software	Responses (N=194)
1	MS Word	190(97.9)
2	Excel	176(90.7%)
3	Power point	160(82.5%)
4	Photoshop	80(41.2%)

- **Use of Operating System:** Operating system is a large and complex software component for the operation and control of the computer system. It acts as an intermediary between a user and the computer system. The students were asked to indicate the use of operating system and the responses can be seen from the table 5. The analysis shows that large majority (90.7 per cent) of the students use Microsoft Windows. Majority (57.2 per cent) of the students use Linux and very few of them use DOS (18.0 per cent) and UNIX (9.3 per cent).

Table 5 - Use of Operating System

Sl. No	Operating System	Responses (N=194)
1	Windows	176(90.7%)
2	Linux	111(57.2%)
3	Unix	18(9.3%)
4	DOS	35(18.0%0

- **Use of Library Automation Software:** In this changing era of knowledge society Library and information centers must require constant positive changes to meet the need of its user. The invention of computer has brought in a rapid change in the society. Library automation not only improves the image of the library staff but also provides additional services to the users with the existing staff. The students were asked to indicate their use of Library Automation software and the responses are summarized in the table 6.

Table 6 - Use of Library Automation Software

Sl. No.	Library Automation Software	Responses (N=194)
1	Libsys	53(27.3%)
2	Soul	64(33.0%)
3	Koha	61(94.0%)
4	Winisis	22(11.3%)
5	Libsoft	12(6.2%)
6	CDS/ISIS	35(18.0%)

It is found that a large majority (94.0 per cent) of the students uses Koha. Few of them use SOUL (33.0 per cent) and Libsys (27.3 per cent). Very few of them use CDS/ISIS (18.0 per cent), Winisis (11.3 per cent) and Libsoft (6.2 per cent).

- **Use of Digital Library/Institutional Repository Software:** Institutional repositories and digital libraries are now being created to manage, preserve, and maintain the digital assets and intellectual output. Librarians are taking leadership roles in planning and building these repositories, fulfilling their roles as experts in collecting, describing, preserving, and providing stewardship for documents and digital information. The students were asked to indicate the use of digital library/institutional repository software and the responses are summarized in the table 7.

Table 7 - Use of Digital Library/Institutional Repository Software

Sl. No.	Digital Library/ Institutional Repository software	Responses
1	Greenstone	48(24.7%)
2	DSpace	27(13.9%)
3	E-print	10(5.2%)
5	Fedora	3(1.5%)

The analysis shows that, a few students use the Digital Library and Institutional Repository Software like Greenstone (24.7 per cent). Very few students use DSpace (13.9 per cent), E-print (5.2 per cent) and Fedora (1.5 per cent).

- **Use of Content Management Software:** A content management system (CMS) is a software program that allows publishing and formatting of digital content in a consistent and structured manner. A CMS makes it easier to deliver digital information anytime, anywhere, on any device, consistent with the open content principles of the Digital Government Strategy. The students were asked to indicate the use of content management software and the responses can be seen from the table 8. The table depicts that, a few students use Content Management Software like Joomla (9.3 per cent), Drupal (5.2 per cent), Mambo and Custom CMS development (1.0 per cent).

Table 8 - Use of Content Management Software

Sl. No.	Content Management Software	Responses (N=194)
1	Joomla	18(9.3%)
2	Drupal	10(5.2%)
3	Mambo	2(1.0%)
4	Custom CMS Development	2(1.0%)

- **Use of Database:** A database is an organized collection of data. The data are typically organized to model relevant aspects of reality in a way that supports processes requiring this information. Subject databases are databases that are discipline specific. Unlike a general database, a subject database

helps you locate articles in a specific discipline or field. The students were asked to indicate the use of databases and the responses are summarized in the table 9. The analysis shows that a few students use database like Science Direct (6.2 per cent), Emerald and Pubmed (4.1 per cent), WINSIS, (3.6 per cent), SpingerLink (2.1 per cent) and JCC Infonet (1.0 per cent).

Table 9 - Use of Databases

Sl. No.	Databases	Responses
1	Emerald	8(4.1%)
2	JCC Infonet	2(1.0%)
4	Pubmed	8(4.1%)
5	Science direct	12(6.2%)
6	SpingerLink	4(2.1%)
7	WINSIS	7(3.6%)

- **Use of Search Engines:** Search engines are the single largest source of web traffic. Search engines have become an essential tool for both the Internet and Intranets. A search engine is any software program that searches for sites based on the words users have keyed in, that have to do with the subject of their interest. Search engines are the work horses of the World Wide Web, returning billions of responses to billions of queries every day, with the major search engines being Google, Yahoo, Bing and Ask. The students were asked to indicate the use of search engines and the responses can be seen in the table 10. The analysis shows that, large majority (80 per cent) of the students use Google. The use of Yahoo by students is very low when compared to Google (47.9 per cent). Very few students use Google Scholar (17.5 per cent), Alta Vista (8.2 per cent), Rediff (5.2 per cent), Hotmail (4.6 per cent), MSN (3.6 per cent), and Lycos (1.0 per cent). Very few (3.1 per cent) of the students use other search engines like Ask, Encite and Info seek.

Table 10 - Use of Search Engines

Sl. No.	Search Engines	Responses (N=194)
1	Google	155(80.0%)
2	Yahoo	93(47.9%)
3	Rediff	10(5.2%)
4	Alta Vista	16(8.2%)
5	Google Scholar	34(17.5%)
6	MSN	7(3.6%)
7	Lycos	2(1.0%)
8	Hotmail	9(4.6%)
9	Others	6(3.1%)

- **Use of Database Management System:** Database Management System (DBMS) is a software system that uses a standard method of cataloging, retrieving, and running queries on data. The DBMS manages incoming data, organizes it, and provides ways for the data to be modified or extracted by users or other programs. The students were asked to indicate the use of DBMS and the responses can be seen in the table 11. The analysis shows that, a good number (37.3 per cent) of the students use MS Access and very few use CDS/ISIS (23.7 per cent), MySQL (11.9 per cent) and Oracle (5.7 per cent).

Table 11- Use of Database Management System

Sl. No.	DBMS	Responses
1	CDS/ISIS	46(23.7%)
2	MS Access	53(37.3%)
3	MySQL	23(11.9%)
4	Oracle	11(5.7%)

- **Confidence of the Students in Using Information and Communication Technology:** Data were collected about the confidence level of the students. These tasks fell in to three categories: routine tasks (Open a file, Save a computer document/file, Print a computer document/file, Moves files from one place to another on a computer and Copy a file from a CD-ROM), Internet tasks (such as download files from the internet, Attach a file to an E-mail message, Download music from the internet and Write and send e-mail), and High- level ICT tasks (Use a spreadsheet to plot a graph, Use software to find and get rid of computer viruses, Create a multimedia Presentation, Construct a web page, and Create a computer program).

- **Confidence in Routine ICT Tasks:** Certain tasks that make use of ICT tools are repetitive, strictly governed and make strong demands on attention and mental awareness. The students were asked to indicate their confidence in routine ICT tasks and the responses are summarized in the table 12. The analysis shows that most of the students are well confident in doing routing ICT tasks which include open a file (97.4 per cent), and save a computer document/file (95.4per cent). Very few of them indicated that they can do these functions with the help of others. In this case all students are aware in these tasks, but some of them cannot do these ICT tasks.

Table 12 - Confidence in routine ICT Tasks

Sl. No.	Routine task	Responses			
		I can do this very well by myself	I can do this with help from someone	I know what this means but I can't do it	I don't know what this means
1	Open a file	189(97.4%)	5(2.6%)	-	-
2	Save a computer document/file	185(95.4%)	7(3.6%))	2(1.0%)	-
3	Print a computer document/file	144(74.2%)	40(20.6%)	10(5.2%)	-
4	Moves files from one place to another on a computer	168(86.6%)	24(12.4%)	2(1.0%)	-
5	Copy a file from CD-ROM	162(83.5%)	24(12.4%)	8(4.1%)	-

- **Confidence in Internet Tasks:** The internet task mainly includes the functions like copy/download files from the Internet, attach a file to an E-mail message, download music from the internet and write and send E-mail. The students were asked to indicate their confidence in Internet tasks and table 13 depicts the responses.

Table 13- Confidence in Internet Tasks

Sl. No.	Internet tasks	Responses			
		I can do this very well by myself	I can do this with help from someone	I know what this means but I can't do it	I don't know what this means
1	Copy/download files from the Internet	172(88.7%)	20(10.3%)	2(1.0%)	-
2	Attach a file to an E-mail message	144(74.2%)	38(19.6%)	12(6.2%)	-
3	Download music from the internet	143(73.7%)	41(21.1%)	10(5.2%)	-
4	Write and send E-mail	170(87.6%)	17(8.8%)	7(3.6%)	-

The analysis shows that large majority of the students can do internet tasks very well which include copy or download files from the internet (88.7 per cent) and write and send E-mail (87.6 per cent). Majority of them can attach a file to an E-mail message (74.2 per cent) and download music from the internet (73.7 per

cent). Very few of them respond that they can do internet tasks with the help of someone and very few of them know what this means but they can't do these task.

- **Confidence in High-Level ICT task:** Self-confidence in ICT high level tasks was helpful in students' reading literacy. Developing self-confidence in computer tasks involves engaging students in meaningful and purposeful tasks by oneself. This is related to computer access rate and integration of ICT across curriculum. The students were asked to indicate their confidence in high-level ICT tasks and the responses are summarized in the table 14. The analysis shows that, the students are poor in High-Level ICT task. Majority (62.9 per cent) of the students are well confident in the use a spreadsheet to plot a graph. Few of them can create a multimedia presentation (33.5 per cent), construct a webpage (27.3 per cent themselves) and can use software to find and get rid of computer viruses (21.6 per cent). Majority of the students can use software to find, get rid of computer viruses (57.2 per cent) and construct a webpage (51.0 per cent) with the help of some one. A good number of them can create a computer program (44.3 per cent) and use spreadsheet to plot a graph (35.5 per cent) with the help of some one. Very few of them know what this means but they can't do these task and very few of them are unaware of the use of High-Level ICT task tasks.

The analysis shows that the students are not better in High-Level ICT tasks. Majority of the students are well confident in the use a spreadsheet to plot a graph. Majority of the students can use software to find and get rid of computer viruses and construct a web page with the help of some one. Very few of them know what this High-Level ICT task tasks means but they can't do these task and very few of them are unaware of the use of High-Level ICT task tasks.

Table 14 - Confidence in High-Level ICT task

Sl. No.	High-Level ICT task	Responses			
		I can do this very well by myself	I can do this with help from someone	I know what this means but I can't do it	I don't know what this means
1	Use a spreadsheet to plot a graph	122 (62.9%)	65 (35.5%)	2 (1.0%)	5 (2.6%)
2	Use software to find and get rid of computer viruses	42 (21.6%)	111 (57.2%)	31 (16.0%)	10 (5.2%)
3	Create a multimedia presentation	65 (33.5%)	94 (48.5%)	20 (10.3%)	15 (7.7%)
4	Construct a web page	53 (27.3%)	99 (51.0%)	34 (18)	8 (4.1%)
5	Create a computer program	46 (23.7%)	86 (44.3%)	48 (24.7%)	14 (7.25)

5. Conclusion

The findings of this study showed a moderate level of ICT competency among the respondents. Majority of the students have computer literacy but when considering the high level ICT competency the responses are very low. Now a day's a number of services provided by libraries are in electronic or digital form, so the Library and Information Science students must aware in library software and technologies to adapt with their future employment opportunities. From the findings, it is clear that the critical factor of institutional provision of ICT infrastructure has not yet been reached. One not only needs the infrastructure available, but also the personal skills in order to use ICT. It is evident from the literature that unless the issue of ICT competency is addressed, it can itself be a barrier to students' learning. We suggest that special funds be created to stimulate the ICT supported education among higher educational sector in Kerala. Regarding future research, further studies must be carried out to understand the ICT competency among students and faculty members of different disciplines in higher education sector in Kerala.

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Managing Service Quality of 21st Century's Hybrid University Libraries: *A User Study*

Sheela Devi **Amritpal Kaur** **Krishan Chander Dabas**

Abstract

This paper aims to discuss all the parameters and dimensions of service quality of 21st century academic libraries in general and Hybrid University libraries in particular. Describes all the challenges, opportunities, and threats before academic hybrid libraries. Explains that due to advancement of information and communication technologies (ICTs), university libraries are radically transforming their physical environment, services, functions, processes, information infrastructure and staff to remain relevant both in learning resources (contents) and service delivering aspects (context), i.e. to deliver service in the way user want. But a service is fit for its purpose if it aligns with the library's mission, rather than if it is fit for the users' purposes. The paper emphasises that Hybrid University libraries need to be sensitive to user needs and expectations, as these are changing along with the changes in ICTs and customer centred practices of 21st century. Besides increasing awareness about quality concepts, the study has identified factors of service quality and ranked them from most to least important. Also suggested measures to manage service quality on the basis of findings of the study.

Service quality, academic libraries, Librarianship in 21st century, Qualitative library service, Measurement of service quality.

1. Introduction

Libraries exist to serve humanity by equipping people with the right kind of knowledge and thus advance the well-being of humankind.Today value added services and satisfaction of library users are the key words for any library, and librarianship in 21st century is known as managing information resources in the way users want and also implementing five laws of librarianship in the light of emerging global information environment. Amid major advancement in ICT's, rapidly changing global education system and academic institutions, ever changing user needs and expectations, emerging social media, and changes in scholarly communication (Jain, 2013) and publishing models such as digital scholarship, institutional repositories and open access, it is very difficult for hybrid libraries to remain relevant to its academic community. But at this junction, these libraries have no way out but to accept and involve fully in sharing this kind of intellectual outputs (Murphy, 2012). Instead of teaching, learning, and research, we have e-teaching, e-learning, and e-research, e-governance, and so on. Since it is within our mission to access and assist, so hybrid university libraries supposed to provide right information at the right time in the right format no matter where the information is available and from where seeker of information is available. Digital technology has further transformed communication, learning, work and most recently cloud computing. Mobile devices and mini tablets allowed shift from textbooks to tablets. Web 2.0 has profound impact on the roles of information providers. With the result library collections have started converting into e-resources and services to e-services.] Emerging social media or web 2.0 (i.e. blogs, forums, wikis, social networking sites, micro blogging sites, social bookmarking sites, social voting sites, social review sites, MySpace, LinkedIn, virtual worlds) is the use of digital media. It includes Internet and mobile devices to collaborate, exchange ideas and achieve commonly-shared goals.

2. The Terms Library Quality, Service Quality, Quality of Service, and User Satisfaction

The terms 'library quality', 'service quality', quality service; and 'user satisfaction' and 'service quality' are used interchangeably in library literature. Quality is defined as the totality of features and characteristics of a product or service which aims to satisfy the stated or implied needs and expectations of the customer in all resp ts. In library profession services are the products which library deals within its mission. Service and quality cannot be disconnected because quality is the manner in which service is delivered. [11) Library

quality is the capability of the library in meeting the needs and expectations of people which it intends to serve. Collier defined service as an idea, information, knowledge, innovation, circumstance, a deed, a performance, an event, an effort and output that is consumed where it is produced. Service when taken alone is intangible. This intangibility, heterogeneity, perishability made services different from products. [12]Satisfaction is a sense of contentment that arises from an actual experience in relation to an expected experience. It is service quality which leads to satisfaction. Thus service quality is the difference between expected and actual experience. A single transaction may lead to satisfaction but service quality is the overall judgment based on several such transactions.

3. Rational and Objectives of Service Quality

The study of service quality helps to identify the areas where service needs improvement from users' point of view. The success of the library depends upon the attention the librarians get from the customers and their reputation for service. Heron and Altman realised the importance of service quality in breaking the myths about library service. It helps in managing change, provides library a place of prominence, offers mechanism to meet mission and vision, tells staff about their business along with needs and desires of customers. Herman and Altman added that those who choose to spend time and attention in the library should be regarded as most precious customers, as people are the reason for having a library and service is basic to delight them. Service quality aims to achieve user satisfaction, user loyalty, reputation of libraries for service, and betterment of libraries.

4. Service quality, Satisfaction and Loyalty of users: A Relationship

Only completely satisfied users become loyal and return regularly. Loyalty and delight of users will be life time achievement instead of transactions in numbers/figures. [15]. Contentment, pleasure, surprise, and fulfillment are four dimensions of satisfaction According to Applegate and Elliott satisfaction is an emotional reaction to a specific transaction and experienced inside the mind. In the same way user satisfaction is a personal and emotional reaction to a library service. Bitner and Hubbert differentiated overall service satisfaction with service encounter satisfaction. Overall and full satisfaction is almost equal to service quality [18] Sometimes satisfaction is confused with expectation but Weaver-Meyer and Wilber did not equate expectations with satisfaction.

Service quality is a very complex, holistic, and multidimensional concept dealing with content, context, performance, service delivery, and expectation gap. It is both personal to individuals and collective among many users. Service quality has three components, i.e., perceived quality (service delivered), perceived value (outcome derived), and customer expectations (service desired). User satisfaction has also three components, i.e. loyalty of user, user retention, and relationship marketing.

5. Scope and objectives of the study

The paper aims to define measure, compare and improve service quality and satisfaction of five university libraries, namely: Kurukshetra University Kurukshetra (KULK); Ch. Charan Singh Agriculture University, Hisar (HAUL); Maharshi Dayanand University, Rohtak (MDUL); Guru Jambheshwar University Hisar (GJUL); and Choudhary Devi Lal University Sirsa (CDUL) from user perspectives. Also to identify factors most affecting service quality and rank them according to their level of influence in university libraries.

6. Analysis and Interpretation of Data

Table 1 - Size of the Sample Population of Respective Five University Libraries

Names of University Libraries	KULK	HAUL	MDUL	GJUL	CDUL	Total
Number of Questionnaires distributed	200	200	200	200	200	200
No. of Questionnaires received back	167 (83.5%)	172 (86%)	179 (89.5%)	174 (87%)	168 (84%)	860 (86%)

After pretest 200 questionnaires were distributed personally according to stratified random sampling comprising UG, PG, M.Phil, Doctoral students, and faculty members of each library on alternate days of Sept. 2012. Respondents were given necessary instructions to fill up the questionnaires. Table-1 shows that a total of 860 filled in questionnaires received back, i.e. KULK (167), HAUL (172), MDUL (167), GJUL (174) and CDUL (168).

Table 2 - Problems Related to Learning Resources, Equipments & Services

Statements	KULK	HAUL	MDUL	GJUL	CDUL	Total
1.Learning Resources	25 (14.97)	16 (9.30)	20 (11.17)	24 (13.79)	35 (20.83)	120 (13.95)
2.Information Infrastructure	15 (8.98)	12 (6.97)	18 (10.05)	14 (8.05)	24 (14.29)	83 (9.65)
3.Services	17 (10.18)	8 (4.65)	16 (8.94)	17 (9.77)	44 (26.19)	102 (11.86)
Users faced problems 1+2+3	**57 (34.13)**	**36 (20.93)**	**54 (30.16)**	**55 (31.61)**	**103 (61.31)**	**305 (35.47)**
Users without problems	**110 (65.87)**	**136 (79.07)**	**125 (69.84)**	**119 (68.39)**	**65 (38.69)**	**550 (64.53)**

*Percentage is given in parentheses

Table-2 shows the responses to a question with regard to problems encountered while using the library. Table depicts that the largest users, i.e. 61.31% of CDUL faced problems, followed by KUKL (34.13%). Out of five libraries, HAUL is adjudged best with lowest users with problems, i.e. 20.93%. Further indicates that maximum problems of CDUL's users were related to services (26.19%), followed by resources (20.83%) and information infrastructure (14.29%). Finding shows that services in CDUL are not delivered in the way users want and equipments and ICT's facilities are not up to their expectations.

Table3: Users Views on User Focus and Service Orientation Aspects

Statement	Responses	KULK	HAUL	MDUL	GJUL	CDUL	Total
All activities, functions, processes, facilities, amenities, and services of the library are arranged around the needs and desires of library users. Library is fully users' oriented?	Strongly Disagree	10 (5.99)	3 (1.74)	9 (5.03)	8 (4.60)	20 (11.91)	50 (5.82)
	Disagree	17 (10.18)	5 (2.91)	14 (7.82)	11 (6.32)	30 (17.85)	77 (8.95)
	No option	50 (29.94)	52 (30.23)	51 (28.49)	47 (27.01)	44 (26.19)	244 (28.37)
	Agree	**67 (40.12)**	**66 (38.37)**	**66 (36.87)**	**71 (40.81)**	**47 (27.98)**	**317 (36.86)**
	Strongly Agree	**23 (13.77)**	**46 (26.75)**	**39 (21.79)**	**37 (21.26)**	**27 (16.07)**	**172 (20.00)**
	Total	167 (100)	172 (100)	179 (100)	174 (100)	168 (100)	860 (100)

*Percentage is given in parentheses

Table 3 charts that merely 44.05% users of CDUL, 53.89% of KULK, 58.66% of MDUL, 62.07% of GJUL and 65.12% users of HAUL agreed with the statements related to service orientation aspects of respective libraries. The inference is drawn that HAUL and GJUL are largely user driven. The score of MDUL is

very near to that stage and the score of KULK with 53.89% is on lower side. The CDUL with lowest, i.e. 44.05% score is hardly meeting its service orientation aspects.

Table 4: Users Views on Service Quality in the Context of their Libraries

Statements describing service quality	Response	KULK	HAUL	MDUL	GJUL	CDUL	Total
1.Providing user education & Inf.Literacy Progms	Agree	28 (16.76)	31 (18.02)	29 (16.20)	26 (14.94)	30 (17.86)	144 (16.74)
2.Providing information /resources both from print & e-sources	Agree	38 (22.75)	34 (19.77)	32 (17.88)	33 (18.97)	54 (32.14)	191 (22.21)
3.providing Inf.Literacy & information/ Information. resources	**S.Agree**	**45 (26.95)**	**50 (29.07)**	**55 (30.73)**	**56 (32.18)**	**47 (27.98)**	**253 (29.42)**
4.Library often has what i need and want	**S.Agree**	**56 (33.54)**	**57 (33.14)**	**63 (35.19)**	**59 (33.91)**	**37 (22.02)**	**272 (31.63)**
5.Ranking of capability of libraries in providing information literacy, information, information resources & meeting needs and wants of users' to their satisfaction covered all aspects of service quality	S.Agree + S Agree	101 (60.49)	107 (62.21)	118 (65.92)	115 (66.09)	84 (50)	525 (61.05)
Sum of responses on statement 1 to 4 covered all aspects of service quality	Total Responses	167 (100)	172 (100)	179 (100)	174 (100)	168 (100)	860 (100)

*Percentage is given in parentheses

To determine how service quality is understood by library users, they were asked to choose only one statement out of four with which they are agree or strongly agree. Table 4 displays that users view is divided among all the four aspects of service quality. Further highlights the ranking order of the capability of respective libraries by combining statement 3 and 4 as 5th one, i.e. in providing information literacy, information and information resources, and meeting other needs and desires to their satisfaction. The score of GJUL is highest with 66.09%, closely followed by MDUL with 65.92%. While the score of HAUL and KULK is slightly lower with 62.21% and 60.49 % score respectively, whereas the score of CDUL is lowest among all, i.e.50%. Here total score of all the five libraries on all aspects i.e. 61.05% also supports that service quality means library's ability and success in providing information, documents, instructions and other needs and desires to the satisfaction of users. The gap in service delivery on all aspects also validated the findings.

Table 5: Relative Importance of Service Quality Dimensions

Dimensions	KULK	HAUL	MDUL	GJUL	CDUL	Total
Reliability: Library's ability to provide promised service dependably and accurately	50 (29.94)	51 (29.65)	55 (30.73)	54 (31.04)	48 (28.57)	258 (30.00)
Responsiveness: Willingness to help prompt service	46 (27.54)	47 (27.33)	47 (26.26)	44 (25.29)	43 (25.60)	227 (26.40)
Assurance: Knowledge and Courtesy of staff and ability to convey trust and confidence	34 (20.36)	34 (19.77)	36 (20.11)	37 (21.26)	36 (21.42)	177 (20.58)
Empathy: Caring and individualized attention provided by the library	22 (13.18)	24 (13.95)	27 (15.03)	26 (14..94)	24 (14.29)	123 (14.30)
Tangibles: Appearance of physical facilities, equipment, personnel and information resources	15 (8.98)	16 (09.30)	14 (07.82)	13 (7.47)	17 (10.12)	75 (08.72)
Total Score	167 (100)	172 (100)	179 (100)	174 (100)	168 (100)	860 (100)

*Percentage is given in parentheses

To have a very clear cut meaning of service quality and relative importance of its dimensions, users were asked to allocate a total of 100 points among the five features according to how important each feature

was to them. They were asked to be sure that the points they allocate to these features add up to 100. Respondents were categorized by their maximum score points to each feature library wise. Self explanatory table-5 presents university wise as well as total view of the importance level of each service quality dimension. Table clearly indicates that reliability, responsiveness, assurance, empathy, tangibles were ranked most to least important by users. The reviewed literature as well as findings of the study do supports this ranking order of the dimensions/ factors of service quality.

User satisfaction with regard to relevancy and quality of all types of learning resources

Self explanatory table-6 reveals that HAUL **tops the list** with a score of 61.63% with regard to **relevancy and quality level of all types of learning resources, closely** followed by GJUL (60.48%), MDUL (58.15%) where KULK got 4th rank with the scores of 56.85%, whereas CDUL slided to the 5thrank and on lowest position on almost all aspects with a score of 49.84%.

Table 6 - Satisfaction with Relevancy & Quality of Learning Resources

Statements	All types of Printed Material			All types of electronic resources			Information Infrastructure			Library website			Access and Assistance			Total A+SA
Res. Scale	SD+D	N	SA+A	SD+D	N	SA+A	SA+A	SD+D	N	SA+A	SD+D	N	SA+A	SD+D	N	SA+A
KULK	45 (26.95)	34 (20.36)	88 (52.69)	41 (24.55)	28 (16.77)	98 (58.68)	98 (58.68)	48 (28.74)	24 (14.37)	95 (56.89)	43 (25.75)	22 (13.18(	102 (61.07)	59 (35.33)	17 (10.18)	91 (54.49)
HAUL	39 (22.67)	31 (18.02)	102 **(59.31)**	36 (20.93)	27 (15.7)	109 **(63.37)**	109 **(63.37)**	34 (19.77)	30 (17.44)	108 **(62.79)**	40 (23.26)	26 (15.11)	106 **(61.63)**	38 (22.09)	29 (16.86)	105 **(61.05)**
MDUL	43 (24.02)	30 (16.76)	106 (59.22)	38 (21.23)	32 (17.88)	109 (60.89)	109 (60.89)	46 (26.7)	29 (15.2)	104 (58.10)	44 (24.58)	28 (16.76)	105 (56.66)	49 (27.37)	30 (16.76)	100 **(55.87)**
GJUL	42 (24.14)	28 (15.39)	104 **(60.47)**	41 (23.56)	27 (15.52)	106 (60.92)	106 (60.92)	40 (22.99)	27 (15.52)	107 (61.49)	38 (21.84)	31 (17.82)	105 (60.34)	43 (24.71)	28 (16.09)	103 (59.2)
CDUL	64 (38.1)	36 (21.42)	68 **(40.48)**	45 (26.79)	34 (20.44)	89 **(52.77))**	89 **(52.77))**	51 (30.36)	36 (21.43)	81 **(48.21)**	49 (29.17)	33 (19.04)	87 **(51.79)**	43 (25.6)	31 (18.45)	94 (55.95)
Total	233	159	468	201	148	511	511	219	146	495	214	140	505	232	135	493
Percent	(27.09	(18.49	(54.42)	(23.37)	(17.21)	(59.42)	(59.42)	(25.47)	(16.98)	(57.55)	(24.88)	(16.28)	(58.72)	(26.98)	(15.7)	(57.32)

*Percentage is given in parentheses

Table 7: User satisfaction with various qualities of library staff

State ments	Availability			Approachability			Courtesy & Polite			Competence & K			Friendly & helpful			Total SA+A
Res. Scale	SD+D	N	SA+A	SD+D	N	Responses	SD+D	N	SA+A	SD+D	N	SA+A	SD+D	N	SA+A	Respo nses
KULK	47 (28.14)	26 (15.57)	94 (56.29)	38 (22.75)	26 (13.77)	103 (61.68)	50 (29.94)	23 (13.77)	94 (56.29)	65 (38.92)	23 (13.77)	79 (47.31)	49 (29.34)	28 (16.77)	90 (53.89)	(55.09)
HAUL	49 (28.49)	21 (12.21	102 (59.3)	46 (26.74)	26 (15.12	100 (58.14)	36 (20.93)	29 (16.87)	107 (62.2)	38 (22.09)	26 (15.12)	108 (62.79)	31 (18.02)	29 (16.86)	112 (65.12)	(61.51)
MDUL	41 (22.91)	28 (15.64)	110 (61.45)	49 (27.37)	25 (13.97)	105 (58.66)	51 (28.49)	28 (15.64)	100 (55.87)	40 (22.35)	32 (17.87)	107 (59.78)	51 (28.49)	29 (16.2)	99 (55.31)	(58.21)
GJUL	40 (22.99)	27 (15.52)	107 (61.49)	40 (22.99)	29 (16.67)	105 (60.34)	41 (23.56)	29 (16.67)	104 (59.77)	39 (22.41)	29 (16.67)	106 (60.92)	41 (23.56)	29 (16.67)	104 (59.77)	(60.46)
CDUL	55 (32.74)	27 (16.07)	86 (51.19)	41 (24.40)	34 (20.24)	93 (55.36)	50 (29.76)	35 (20.84)	83 (49.4)	46 (27.38)	31 (1845)	91 (54.17)	42 (25)	30 (117.86)	96 (57.14)	(53.45)
Total	232	129	499	214	140	506	228	144	488	228	141	491	214	145	501	
Percent	(26.98)	(15)	(58.02)	(24.88)	(16.28)	(58.84)	(26.51)	(16.74)	(56.75)	(26.51)	(164)	(57.09)	(24.88)	(16.86)	(58.26)	

Table 7 depicts user satisfaction level with various staff qualities. Regarding the mean-score of overall user satisfaction with staff quality, table denotes that HAUL got the highest, i.e. 61.51% score, followed by GJUL (60.46%). The score of MDUL and KULK slided to 58.21% and 55.09% and got 3rd and 4th rank respectively. Out of five universities the score of CDUL is lowest, i.e. 53.45% amongst all with regard to overall staff quality.

7. Suggestions for management of service quality

We need to consider our user as our customer and major stakeholders. Utmost focus is required for user education/Information Literacy programs in hybrid university libraries. It has become the most important part and aspect of service quality in this digital age because our users want to use the library in the same way as modern librarians do. For this continuous professional development (CPD) and collaboration with it people is essential.

If library is to base upon what the customers say then it has the chance to change its processes to bring service provision into closer alignment to customer expectations. This is standard in TQM. It is also called 'continuous improvement'. It is necessary because customers' needs and expectations are changing all the time. There are three stages of management of service quality: planning, controlling and implementing. In planning we decide the service elements in the light of mission, expectations and competitors In controlling stage measurement is done through regular surveys of users and deviation of the actual performance of library services is identified, and specially the weak areas and processes of the system. In third stage various programms and policies are implemented and resources are diverted accordingly for improvement of the weak areas. This stage is also known as implementing users expectations in the system and is also known as empowerment of the users.

Customer friendly system for complaining customers is essential for removing the bottlenecks of the system and developing loyalty of customer. We need to manage not only complaints but also potential discontent attitude of the complaining customers.

Carr (2010) suggested that academic hybrid libraries need to be service driven and satisfy the needs and desires of their users due to : 1) forces of competition allied with the customer–centered practices; 2)

emergence of information as a commercial commodity; 3) domination of users service aspect over ethos of collection, administrative procedures, rules and regulations; 4) emergence of service quality, accountability and performance measurement as key factors; 5) competition for resources among academic institutions; 6) changing information seeking habits and expectations of users due to advent of information in electronic form and dominance of internet in 1990s; 7) increasing demand to access global e-information led to redesign library's services accordingly; 8) growing demand for online catalogue and manual catalogue becoming out of fashion; and 9) staying in close with users' had become a matter of survival and self respect for librarians.

8. Conclusion

Reviews of various user studies indicate that library's existence is the dependent factor of users' satisfaction and that satisfaction of users further depends on perceived quality, perceived value, and users' expectations. All these aspects need to be covered within dimensions of service quality which is based on the service elements of hybrid university libraries in 21st century as per the mission of university library. Loyalty of delighted users is a valuable indicator for the quality of library services. For users' delight libraries need to come closest to the needs, desires, interests and expectations of the users. Because users will tell which button to push. Blended librarianship is needed to manage global knowledge in all its forms and Medias for the overall satisfaction of the academic community with regard to contents and context of the user. [32] To serve users in the way they want them to serve, libraries need to mend their ways and innovate their services, facilities and processes, and activities as per 'user logic' and not upon classical 'library logic' (Harbo, 2012). [33] To survive in this competitive information environment we need to create the roadmap for fundamental transformation (De Belder, 2013) by learning new skills and competencies.[34] It is expected that Google will cover all aspects of librarianship in very near future and will be world library. Every user will use e-books and present day librarians and libraries will play a key role in e-research.[35] In view of the above service quality has emerged as a strategy for the success of Hybrid university libraries in this digital era of 21st century.

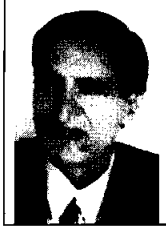
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Managing, Redesigning and Rearranging School Libraries in the Changing Information World

Lopita Mukherjee



The application of Information and Communication Technology in every sphere of life has changed the ways of our life. It has affected the libraries and has changed the ways in which they used to handle information. But the school libraries remain unaffected. A survey conducted in the year 2000 and a resurvey in 2006 show the miserable condition of the school libraries in and around Kolkata. They lack every essential components of modern library. In this paper a model school library is framed keeping in mind the traditional and digital essentials of the library. The ways by which school libraries can raise their fund and utilize this limited fund for maximum benefit is discussed in details. An appeal has been made to Government to provide fund, set standard and inspire the managing committee of private schools to provide these benefits. Several ways to improve the service and enhance the reading habit are also discussed. A school library plays a great role in nation building so it must contain all the essential components of a modern library.



Communication Technology, changing ways, School Library, maximum benefit

1. Introduction

Information and Communication Technology (ICT) has provided the society with a vast array of new communication technologies and has changed the way of our life. The Internet and Web technologies have changed the way of interaction, communication, knowledge sharing and creation and reuse of information. It is evident that information and communication technologies have brought new dimensions in the process of information acquisition and access, consolidation and communication, creation and retrieval, downloading and distribution throughout the world. To sustain in the emerging environment the libraries have to respond positively. The electronic environment provides an opportunity to design and disseminate new services. The libraries have to integrate their traditional services with net based services suitable for sustainable and seamless infrastructure. They have to devise bibliographic tools like webliographies, subject gateways that permit easy searching and browsing and develop portals that render and present content in user customized formats.

The school libraries must redesign themselves according to these changes. The importance and the utility of school libraries have been felt by education commissions, educationists and every person linked with education. The students are the builders of the nation and development of a country depends largely on the educational development of the students. A school library has a very major role to play in this field. The school libraries act as a stepping stone to the other libraries. The concept of modern libraries with ICT will provide the students all the information they need and train the students to explore library resources at the later stage of life.

2. Purpose

The miserable condition of school libraries in and around Kolkata is traced on the basis of a survey of 134 Higher Secondary and Secondary Schools done in the year 2000 and resurvey of 99 schools in the year 2006 for PhD THESIS. S. R. Ranganathan stated, "The result of modern re-thinking on education is to make the library the heart of the school from which every activity in the school radiates and by which it all gets irradiated."(Ranganathan 1962) But it is seen in most schools libraries are rather ornamentation instead of being part and parcel of every important activities of school. The wretched condition of school libraries implies that this should brought in notice of the eminent personalities in national and international level and model school library should be designed.

3. Condition of School Libraries in Kolkata

134 schools were surveyed in the year 2000- 2001 and 99 schools were resurveyed in the year 2006 to find out their condition and changes, if any occurred in a span of five years . The conditions of school libraries, as noticed in the surveys, were not very bright. Lack of trained staff, adequate books and proper processing system were responsible for their miserable condition. Introduction of modern technology was like a dream and ignorance of library staff and the teachers of utility of library and proper utilization of the resources were adding to the misery. There was no fixed ratio between the number of books and number of students and complete absence of any set standard was felt. There was great disparity among these libraries as many well renowned English medium private / missionary schools had well equipped libraries, some Government or Government aided schools libraries had fair collection and trained librarian, whereas, there was absence of proper libraries and librarians in some Government or Government aided schools. There was inequality among the private schools also as the schools which were small, not so famous did not have proper libraries and qualified librarian. The libraries in Government or Government aided schools depended on irregular Government Grant and they could buy books only after the grant came, which might vary from five years to twenty years. In some schools the grant never arrived.

In the resurvey it is seen that the overall scenario had not changed within three to four years. Though in some schools, which did not have libraries in the first survey, libraries had been established in the second survey, in some others, library service had stopped due to non-existence of librarian as a result of non-recruitment of new librarian after retirement of the old one .There had been no effort to rationalize a fixed amount of grant, after regular interval of time, the amount depending on the number of students. Very few libraries used modern technologies and the collections of most school libraries were not developed properly. There was complete absence of any plan to set any standard or to link the school library with every activity of school. It had been noticed that there was a tendency to run the library with the help of part-time trained library staff in case of non-existence of regular librarians. Sometimes they were employed to organize the books procured recently or early due to non-recruitment of librarian. (Mukherjee, 2009))

4. Managing school libraries in the changed scenario

- **Fund:** Whenever we talk about management or any development finance plays a major role. The survey revealed that the source of financial support for library in case of Government aided or Government schools were nominal library fee and irregular Government Grant. In case of non Government schools the funding depended on the will and whim of management or the Head of the institution and substantial amount as library fee. The 'library fee' collected by the schools were not always spent for library development. Efficient functioning of a good library needs fund. The school authority must be fully aware of it and they must provide the library fund needed for efficient functioning. A fund calculated on the basis of number of students must be fixed and Government should provide this money for the Government Schools and Government aided schools and motivate the private school authority to do the same. Firstly a capital grant should be provided for basic collection without which a library cannot function. Recurring grants for purchase of books, periodicals and other library materials should be provided annually. The grant sanctioned for the library should be spent for library development only. It had been seen cases like Sreguru Sangha, a religious organization, the local unit of Lioness Club and State Bank of India donating books to respective school libraries. In a school an ex-student residing in USA had provided fund for development of the library. In two schools Sarva Siksha Abhiyan had provided library grant. But to most libraries these proposals had not come. The donation which was common to all the libraries was specimen books from the publishers. (Mukherjee, 2009)
- **Staff:** The Mudaliar Commission appointed in 1952, by the Government to examine the prevailing education system commented about the school librarian, "Efficient Library Service must be given by appointing highly qualified and trained librarian who would be able to guide interests of students, give due publicity to good books, old and new, available in the library, prepare and circulate booklist suitable for different grades, display 'blurbs' and cutting of book reviews on notice board, arrange

book exhibition, conduct a group reading project and consult in selection of good books."(Ministry of Education, 1953) Trained librarian should be there in every school library. The number of staff in the library should be at least three; librarian, assistant librarian and library assistant, and this number may increase according to the number of students and size of the library as the school libraries serve. At least one staff should have professional degree in computer who can meet the necessities of the changing scenario.

- **Library Committee:** A library committee should be formed consisting of the Principal, librarian, some of the teachers and interested students. The committee will help the librarian in major decision making process. The demands for requisitions like buying a new shelf or issuing a particular magazine, forwarded by a committee will be stronger. The committee will know the condition of the library and will enlighten the other members of the school about it. Finally, book selection, periodical selection and other activities will be more democratic in nature, not wholly depending on the whim and will of the librarian.

- **Book Selection:** Books should be purchased at regular intervals say once or twice every year. Book selection must be done properly, with the help of teachers, students and Principal. A register should be maintained to note down the request for purchase of books throughout the year. Subject teachers must be consulted for buying subject books and English and Bengali teachers for selecting storybooks. The students who borrow the books regularly may be consulted as their opinion will be valuable, the importance given to them will encourage their reading habit and other students will try to follow them to get importance.

- **Library Hours and Library Period:** The library should be open during school hours for the students and the teachers. The librarian or the library staff should be there. It is better to open the library half an hour before school and close it half an hour after the school gets over so that the interested students may come, as they do not have free period. It is better to have a separate break time for the library staff, avoiding the break time of the school for its maximum use.

  Each class must have a library period or at least some fixed time, once a week, to come to the library. If the class consists of a large number of students half the class should come at a time otherwise the quality of service will be not up to the mark.

- **Book Exhibition:** Book fair or book exhibition by the publishers should be encouraged by the school authority as the display of colourful books will make the students eager to possess books and read books thus inculcate reading habit in them.

- **Meeting of Librarian and Teachers:** A major setback of a school library is the librarian's total ignorance of curriculum, instructional method and teachers' ignorance of the library and its resources. This problem can be solved if the teachers and librarian sit together once a month. The teachers may inform the librarian the topics they will teach or the project works that would be given and the librarian can direct them to the library resources that can be provided for the purpose. In addition to this the librarian must give the different subject teachers the list of books which are there in that subject.

1. **Implementation Plan for Modern Technologies in School Libraries**

- **Library Automation:** A school library must be automated. Suitable software should be used and all housekeeping operations should be automated.

- **Internet:** Internet must be there and it must be used to avail e-books, e-journals, catalogues, encyclopedias, abstracts and much other information.

- **Main Server and terminals:** There should be a main server connected to several users' terminals. Terminals may be placed outside library such as in Principal's room, office etc information exchange can be done beyond the four walls of the library.

6. Main Services

- **Free online journals:** The teachers and students may have electronic access to e-books and free online journals and protocols for the laboratories.
- **Free online books**
- **Free encyclopedias**
- **Free Newspapers**
- **Free online dictionaries**
- **Free online catalogue services:** To save the time of the reader the important websites which are useful for them can be written on the board.
- **Question Bank Cell Service:** There is great demand for previous years' question paper and model question papers before examination. These must be kept in an organized way and provided on demand.
- **Helpline Centre:** The library may act as Helpline centre to students. The librarian may give personal service to each student helping him to find documents answering his interest pin-pointedly, exhaustively and expeditiously.
- **Telephone or Cell phone service:** If the user asks any information through telephone or mobile phone the librarian may give him proper answer and guidance.
- **Online enquiry service:** If the user wants any information for any project or competition through online it should be answered.
- **E-mail service:** This service has got advantages of answering in details than what could be possible at a busy reference desk. It provides the librarian the time to think about the query properly, to consult his colleagues or subject experts, if necessary.
- **Chat based service:** Announcements for tests and internal competitions and many other things may be sent through instant messaging.
- **Inter Library Loan service:** The reference materials, model question papers and other materials can be shared in this way.

7. Teachers

The teachers were seen to look after the library if there was paucity of librarian. But they were not found to take active role to make the students library oriented. They did not use the library and they did not inspire the students to use library books to enrich their knowledge in a subject in addition to school books nor for quiz, art and craft and other activities. They may play a major role in directing students towards the library. The teachers are the role models and ideals of the students. A positive effort on their part will automatically direct the students to the library and enhance library use.

- **Project Work:** Assigning Project Work may increase the use of school libraries. If the project works are set after a careful scrutiny of the library resources and students are given idea which books to consult the library will be used often. Availability of Internet facility in the library will facilitate the project work more fruitfully.

- **Directing Students towards Books:** A teacher, while teaching a particular chapter, instead of dictating ready notes, may advise the students names of few books, which are there in the library to consult and this will positively make the students library oriented. They must not dictate ready notes.

The use of ready notes from notebook, in different subjects, should be discouraged as much as possible. These notes are generally of low quality and they do not strengthen the basic knowledge and affect the library going attitude of the students. The students would rather digest these, as they are easily available, instead of hours of hard work in the library. This results in limitation of knowledge and decline in reading habits.

8. Concluding Remarks

The school library plays a great role in nation building as it strengthens the basic foundation of the youth in different subjects. Proper education system should be devised in such a way so that school library can play central or pivotal role in the education system. The necessity of designing school libraries with fair collection of book and non book material is very much needed.

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Organizing Librarians for Greater User Engagement

Choy Fatt Cheong

1. The role of libraries in information provision

For a long time, the power of a library lies mainly in its collection. Libraries are looked upon as a source of information that enable scholars, researchers, students and ordinary people to learn, make discoveries and support their intellectual activities. However in the last two decades, the information provision role of libraries has diminished along with the rise of the Internet.

What defines a library now? There is no doubt that libraries today should continue to play their important role of providing access to information, particularly materials that need money to acquire and subscribed to. By pooling together financial resources, libraries enable a large group of users to have access to expensive resources which the single individual could ill afford.

However the relative value of this access role has lessened in the face of the seemingly vast sea of information that is freely available on the Internet. It is not only a fact that the Internet enables people to access a lot of free information, but also that the Internet enables people to easily communicate with each other to exchange information, a kind of invisible college of the 21st Century. It therefore does not come as a surprise that the role of libraries as information providers is no longer considered critical by many people.

2. The strength of libraries

Does this mean that libraries no longer play an important role in learning, teaching and research? Obviously not! Libraries and librarians have built up strong networks in the communities they serve, whether in local towns and cities or schools and academic environments. We are generally seen as trustworthy, reliable, impartial, friendly and very user oriented. In a survey of 1,700 adults by the Institute of Museum and Library Services (IMLS), it was found that libraries and museums are the most trusted sources of information and are trusted far more than other sources of information including government, commercial and private individual websites (Griffiths, J. & King, D.W, 2008). These are all important qualities for any institution in this information and knowledge century.

As information transforms from streams to oceans, it becomes more difficult to manage, use and make sense of it. This is where libraries and librarians can continue to play useful roles. Librarians have been involved in different facets of the information transfer cycle, from provision, access, management, dissemination and use. This familiarity should provide a head start in understanding and responding to the new challenges in the information world.

3. Changing the focus of libraries

However in the past, libraries have been largely focused on the supply side of information. We have built up strengths and expertise on getting and providing information, organizing it systematically for access and disseminating it to users. To the uninitiated, this does not seem to be much different from how the Internet provides value to people, although we librarians know that qualitatively, there is a world of difference.

Instead of facing a lack of information, most people today are struggling with identifying the right information among the deluge they encounter, judging the reliability and authenticity of information, making sense of information and using it appropriately to meet their needs. People are also creating and publishing information much more than they have done in the past, adding to the richness as well as the frivolity of the information world. The wide spread and convenient availability of information and tools for information

creation has created new challenges in the use of information. Libraries should shift their roles towards meeting these new challenges.

Some of the routine services that libraries provide today are already focusing towards these changes. For example in instructional services, librarians teach information literacy skills to help people make sense of and use information effectively. Even the oldest service that libraries offered, i.e. reference services, is aimed towards the new challenges. It provides assistance to users when they need clarification or are stuck with information seeking process. Even though use of reference services has been declining, the process of eliciting and clarifying users' questions (reference interview) is an important part of dealing with information, which librarians can impart to users on how to handle their information needs better. The decline in use of reference services (for example, see Martell, 2008) is likely due to behavioral changes of users arising from a changed information environment rather than because the skills of reference librarians have become irrelevant.

Libraries should focus more on helping users engage with information rather than just passively provide documents and information. Useful skills of librarians such as in reference work should be transformed to fit in with new patterns of information seeking and use behavior. There is also scope in providing assistance and new services to users in common activities they participate in, such as content creation and publishing. Greater immersion among users will likely yield more insight into what they really do and need from libraries.

4. Librarians define what libraries are today

Users today need more assistance in using rather than access to collections or information. Their engagement with information spans a whole range of activities, including finding, identifying, clarifying, analyzing, selecting, using, creating, publishing etc., and not just access. These activities can be supported by the expertise and ingenuity of librarians. Librarians need to take advantage of their information skills and their familiarity and understanding of the information industry to create new services. Though some of these may be based on an extension of our current skill and expertise, others may require us to embrace and develop new areas of expertise wherever opportunities arise.

Furthermore, as libraries are increasingly providing information and services online to users remotely, there is less need for users to come to the Library to seek assistance or access collection or resources. It is more likely that librarians have to reach out to engage with users in order to provide these services. The way in which libraries deliver their service will change the way libraries operate and present themselves.

Greater engagement with users will enable us to understand the real needs of our users, which in turn will lead to provision of relevant services that add real value. In an unpredictable environment, as in this information era, it is important to keep constant track of developments on the ground and respond to them. Librarians on the ground engaging with users are the eyes and ears of the Library.

Thus, whereas collection determines the value of libraries in the past, librarians will define and determine the value of libraries in this era. Libraries should be seen as a collection of librarians with diverse knowledge and expertise in various areas of information activities and not just a collection of books and information resources. Services provided by librarians should characterize and define the library today just as the range and depth of collection determined the value of libraries in the past.

We should focus on developing the work of the individual librarian as well as the combined effort of librarians to build the strength of our libraries. To do this, we need to organize our libraries to enable and encourage librarians to function in this mode effectively.

5. Organizing staff in NTU Libraries

At Nanyang Technological University (NTU) Libraries, we started to re-structure our organization in

2005 in response to the changing behavior of library users and to transform ourselves into a user-centric organization. The goal of the re-structuring was to

- Increase interaction between librarians and users
- Develop the expertise of our library staff so that they can provide excellent individual support and services to users
- Implement a staff structure that is adaptable, flexible and supportive of user engagement

Achievement of these goals requires significant change to how librarians worked in the past. The largely outward approach demands not only new skills but also behavioral changes that many librarians may not be comfortable with due to their training and expectations in choosing the profession. As librarians are the key to success in the future of libraries, we have to focus on developing our staff to realize our goals.

6. Background information on NTU and Libraries

For background information, our libraries serve a population of 33,000 students and about 6,000 academic, research and administrative staff. The Library system is made up of 8 subject libraries and 5 supporting groups. The subject libraries are Lee Wee Nam (comprising Engineering & Science), Business, Art/Media/Design, Humanities & Social Sciences, Chinese, Communication & Information, Medical and Wang Gung Wu (focusing on overseas Chinese collection). Each subject library provides front-end services to users in the respective subject disciplines.

In the last 10 years, NTU has grown rapidly in terms of student population, academic programmes and research. The University is organized into 4 colleges (Engineering, Science, Business and Humanities & Social Sciences) and other autonomous institutions. Recently it partnered with Imperial College in London to set up the third medical school in Singapore.

The Library has an establishment of 106 staff, comprising 46 professional librarians and 60 paraprofessional and support staff. The library staff to user ratio is fairly low compared with other comparable research universities (e.g. those in North America's Association of Research Libraries, ARL). This is one of the major constraints that the Library faces in serving a large population of users with very diverse needs. Each of our librarians serves on average 848 users, or 717 students and 130 staff.

7. Subject librarians in dual role system

Our main strategy for greater engagement with users is to establish a network of subject librarians that will work closely with users. Many academic libraries assign subject librarians to provide direct information services to specific disciplinary groups in their institutions in addition to library staff performing functional work in various areas of library operations and services (see Pinfield, 2001 for discussion on roles of subject librarians). Subject librarians are the key to user engagement as their work is focused on meeting the needs of their user group. As the interface between academic staff and students on one hand and the library on the other, they are, as I suggested earlier, the "eyes and ears" of the library. If they engage well with their users, they can anticipate needs so that new services can be initiated to meet them. They can also monitor more closely the value of various new or existing services provided by the library. In recognition of the potential roles of subject librarian, our Library decided in 2005 to make this the corner stone of our re-organization effort.

Successful engagement with users should to be conducted at a personal level to be effective. A librarian needs to develop good working relationships with individual users and not just be a point of contact only when a need arises. This is only possible if a librarian focuses on a small group rather than a large one. Having one engineering librarian to serve 800 academic and research staff in engineering is much less effective in

having one aerospace engineering librarian to look after 50 aerospace engineering staff. The goal in organizing our staff was to assign a librarian to each of the major disciplines offered in the university. The problem was that we do not have enough librarians to assign them to all the major disciplinary areas without sacrificing all the technical and other user services work which are required to operate the Library.

Our solution was to create a dual role system for librarians. Each librarian (except for a few in managerial positions) was assigned 2 roles, one as subject librarian and the other in an operational role supporting various library functions. They would perform each role roughly half of their work time. For example, the environmental engineering librarian is also a cataloguer in the Bibliographic Services Division and the linguistics librarian is also the access services librarian in Central Services.

The subject librarians are distributed among 8 subject libraries. In a nutshell, subject librarians are the front-end face of the library providing direct information services to specific groups of users via the respective subject libraries. In turn, they are supported by back-end services provided by the 5 operational/functional groups, i.e. Library Technology, Technical Services, Central Services (comprising Access Services & Promotion Services), Scholarly Communication, New Media and various staff functions.

Since 2005 when the dual role system was put in place, we were able to assign 38 subject librarians in each of the major disciplines covered by the University.

To create more time for subject librarians to do their work, we outsource as much operational and technical service work as possible. A substantial number of student assistant positions were also created to assist in a wide range of operational work, which was not limited to the usual shelving and routine clerical work but also include website maintenance, multimedia and graphic design, events management, etc. These measures help to optimize staff time on operational work, increase their subject librarian services and hopefully afford them more time to explore and develop new services.

All these changes occurred with many adjustments and hiccups along the way. The major concerns among staff were on balancing their dual roles and in reporting to 2 supervisors. It was not an easy journey but has been generally accepted as the best way for us to move forward as a Library under present constraints. A secret straw poll among librarians in 2010 re-affirmed this approach.

8. The roles of subject librarians

At the beginning, subject librarians were assigned the following roles in their respective subject areas of responsibility.

Liaison work with users	Identify and assess users' information needs; collect and solicit and respond to user feedback; inform users on news, events and developments of the Library and organize social gatherings and meetings with users; participate in user activities
Subject collection development	Develop, review and maintain subject collection profile in consultation with faculty staff; select books and AV materials; monitor and control budget for subject resources; develop and maintain comprehensive subject guides
E-resource management	Manage and troubleshoot problems in use of e-resource collection; review adequacy of e-resource collection, monitor and analyze use of e-resources; recommend e-resources; provide users with updates and notification of changes in e-resources
Consultation	Answer reference queries and escalated referrals on subject-related queries; provide guidance and advice to users on information seeking and related matters; advise other library staff on subject cataloguing, weeding & relegation of library materials whenever necessary

Promotion	Provide library briefing and orientation to new academic staff; Promote use of subject resources through events, talks, exhibitions and production of information materials including print collaterals and online media
Instruction & user training	Conduct classes on information literacy and subject tutorials for students; develop and maintain training materials, including use of online media

Though this list of roles forms the routine backbone of the work of subject librarians, they change according to needs and development over time. In the last 2 years for example, subject librarians have been more involved with using social media such as Facebook, Twitter and blogs as outreach and information dissemination tools. Lately they were actively involved in advocating and assisting academic and research staff to deposit their publications in open access repositories to help increase their exposure and online presence. Another new area of work involves initiating, coordinating and managing content created by academic and research staff.

At the same time, effort in some areas of work such as collection development was reduced as we rely more on approval plans for maintaining mature collections. Subject librarians are also not expected to pay equal attention to all their prescribed roles, but instead to focus on key areas that are relevant to their situation and development. Furthermore, it is important to note that subject librarians perform these areas of work with support from the respective operational divisions. For example, in promoting the use of a newly acquired e-resource, the subject librarian will be supported by the Library Promotion Division to produce collaterals and other administrative work.

9. Impact on users and services

The dual role subject librarian system has enabled our Library to be more closely engaged with our users, particularly academic and research staff. Though there is no direct evidence of its impact on the community, there are good indications that the library is reaching and serving our users well from informal feedback and formal independent surveys. This is not possible to achieve if the Library had remained in the static mode of waiting for users to come to the Library rather than a more proactive approach in the subject library system. The positive changes that the system brings can be illustrated by anecdotal accounts, some of which are recounted here.

10. Better understanding of users' needs

Closer relationship between subject librarians and users tend to encourage more honest feedback that lead to mutual benefit. For example, a journalism resource with very useful content was acquired by the Library and was assigned to the journalism subject librarian to manage. Some users encountered access issues and it was natural for them to approach their subject librarian, who then investigated and discovered that the problem was due to the inability of videos in the database to be played on mobile devices due to the need for Adobe flash player. The experience made the subject librarian more aware of the prevalent mode which users access content today. This enables him to incorporate important criteria in selecting resources in the future.

The dual role system also encourages librarians to think holistically, to see their role as one continuous stream rather than as a separation between technical and public services. The environmental engineering librarian whose other role is a cataloguer reflected, "every user encounter at the reference desk or at a library event or during our library instruction classes deepens and enriches the way I perform my part in selecting books, assessing learning needs and finding out what users really want from our library catalogue or search tools or other pieces of metadata I add to library records..."

11. Discover opportunities for innovation

One of the aims of the subject librarian system is to encourage them to look out for new areas of collaboration with users and ideas for innovative services. Sometimes small projects arising from user and librarian collaboration could lead to larger changes in service provision.

For example, regular contacts between the humanities and social sciences librarians and their faculty staff led to a number of blog-based projects. The psychology librarian was involved in instructing and helping students to set up blogs for submission of assignments, which led to greater awareness among students on library services. A sociology course blog was also set up by the sociology librarian at the request of her faculty staff as a new approach in teaching. It was a successful undertaking with high student participation rate. Other blogs were also set up by the librarians at the request of faculty as platforms for teaching and learning.

An example of one of these resources that the Library helped to set up is Teach 3.11 (see http://teach311.org/), a multilingual guide to academic resources relating to science, technology, health and environment in Asia. The faculty staff who initiated the project commented that "the value of working with NTU's library staff on this project include ... the much appreciated technical support, the ability to improve the look and design of the blog presentation, and ongoing conversations about how to support and manage researched materials content for archiving, sharing, and public outreach, to name a few."

As a result of these experiences and projection of further demand, the Library decided to introduce a regular content creation service. Subject librarians will lead in coordinating the development of similar resources in response to user requests. Their work will be supported by a new work unit, Digital Projects which was recently set up under the Scholarly Communication Group.

12. Librarians as facilitators

During each new academic year when new students arrive, all subject librarians will send a personal note to each new student to welcome them as their subject librarian. This often forms a positive impression of the Library upon the student and results in better use of library resources and services. Similarly instruction classes conducted by the subject librarian for their specific groups of users allow users to personally identify the librarian whom they can seek help from when needed. The art history librarian recounted an example where a student specifically sought her help as an art librarian in finding a picture of a painting after failing to do so from searching on the Internet. Due to the librarian's knowledge and expertise in art librarianship, she was able to find what she wanted in spite of being given a wrong lead. Ordinarily, most students would have just concluded that if it's not in Google it does not exist! Having access to a subject librarian enables the student to turn to a personally known, creditable source of expertise to meet her information needs.

For subject librarians themselves, being assigned to a subject area also creates a sense of affiliation with their user group. On one occasion, the physics librarian was attending a copyright course and found some of his users from his department there as well. He discovered that they were there to learn more about copyright issues as they were preparing to build a publicly accessible quiz that may re-use some textbook materials, among other things. As the New Media Division in the Library was exploring the use of plug-ins in blogs to support different types of content, the physics librarian connected the 2 parties which resulted in a Library-Departmental collaboration to create the quiz on the Library's blog platform.

Sometimes when users have no one to turn to for help in teaching, learning and research matters, the subject librarian becomes a natural contact point. The Earth Sciences librarian recounted the following story from her first month or two of work at NTU Libraries, "the new term had just started when I got this SOS request over the weekend from a faculty member.... (it) was about the mess she was in because she needed her students to submit their assignments via Turnitin on the University's learning management system (LMS) and she had been unable to get sufficient help to set it up from the regular channels. I was happy that she thought of me as the next option - her subject librarian but at the same time I also wondered how I could help

her do this when I did not have enough experience on this myself to solve her problem within a short time. I immediately alerted a senior librarian who managed to meet up with the faculty the next day and was able to solve the issue in time".

13. Increase engagement, interactions and collaboration with users

Library space is important to help build a sense of community among users. Subject librarians can encourage their users, whether they be faculty staff or students to use library space as part of their teaching and learning activities. For example the subject librarians in the Art, Media and Design Library actively promote suitable library spaces for faculty and staff to showcase their creative outputs or conduct class critiques. A list of possible spaces and locations was posted and we received many interesting proposals that turned the library into a vibrant place (for an example see 16 Art Theoreme http://vimeo.com/77660960). Faculty staff also participated with their own installations (see <http://www.flickr.com/photos/ntulibraries/sets/72157635246840223/)

The English literature librarian also actively sought out literature students to make them more aware of library services. After meeting with the NTU student drama club, they started to plan for a poetry reading event in the library in October 2013. Students and faculty were invited to read from their creative works and the event registered a high turnout rate. Following this event, which was called a "Night at the Library", the creative writing faculty approached the library to work further with them in showcasing student works. Besides hosting live readings, we will be setting up course blogs for the student creative writing classes in the coming semester.

14. Create awareness among users on the role and usefulness of librarians in their pursuit of research and learning activities

As users work more closely with subject librarians, they often realise the strength and resourcefulness of librarians and seek further collaboration and assistance. Many users who seldom have encounters with librarians are often pleasantly surprise by the depth of knowledge of subject librarians who can offer them help. Our subject librarian system works by escalating users enquiries to appropriate level of assistance. In one instant, the computer engineering librarian referred a chemistry student to the chemistry librarian when his query on the Detherm database became too technical. The student was happy to have someone who can understand the subject enough to assist him. The more encounters that subject librarians have with individual users, the better will be the value of the library in their eyes.

Besides subject knowledge and technical skills, subject librarians also have good organizational and information skills which users who encounter them often experienced and later utilize. For example, the Media Arts Librarian was invited by his faculty staff to be part of the symposium committee as co-editor and compiler of submissions because he was impressed by the librarian's ability previously in supporting his information needs. The librarian also helped to contact journal editors to publish the proceedings. Faculty staff of the Chinese Division was also impressed by the Chinese Literature Librarian's ability to organize exhibitions and compile information in social media relating to the writer-in-residence programme and they intend to involve the library more often in their academic programmes and activities.

15. Conclusion

Subject librarians play an important role in transforming the library into a valuable institution in the 21st Century. They provide a human face and cultivate strong relationships that serve as a springboard for users to engage successfully in all information activities that support learning, teaching and research work.

The stories above illustrate some of the ways in which the Library tries to immerse into the user's work and learning environment. Active engagement with users often results in our better understanding of current and changing user needs. Users will also be more aware of what libraries and librarians can do for them in

dealing with the complex information environment. Hopefully this will lead to a changed perspective on the library as a collection of librarian expertise and not just a collection of books and information resources.

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Public Libraries in an Environment of Change: Changing Roles, Responsibilities and Perception in the Information Age

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We live in the rapids of change. Change by its very nature is disruptive and upsetting, but it is a force that is reckoned with constantly. Public libraries exist in dynamic environment but are often chaotic. This article intends to provide brief overview of the nature of changes brought about by technology and the associated challenges faced by public libraries in India. It also tries to investigate the ways by which the anticipated changes can be introduced effectively.



Public libraries information age.

Introduction

The world is going through an enormous change. Change is constant and everywhere. Change is all around us – an enduring feature of modern times giving rise to anxieties and stress as well as to challenges and opportunities. The emergence of new technologies, worldwide communication systems, global networks and the expanding frontier of the web surround us with a continual flow of new directions and opportunities. In today's environment, organizations are introducing changes in response to internal & external stimuli. Where the whole world is being affected by the pace of quickened technological change, public libraries are not exception to the impact of such changes.

The public library of present era is an institution facing numerous challenges, both from inside and from outside factors. India though the largest democratic country and second largest country after China in terms of population growth yet a large rural and urban population of country is still untouched by technical advances taking place worldwide. Emerging information and communication technologies have significantly effected the information landscape. Digital technologies have transformed methods of research, communication and teaching and these changes in turn have changed the needs of information users. As the new information technologies have become critical there is mounting pressure on public libraries in India to change their structure and services.

Public Libraries in India

The independent India has experienced tremendous growth in literate and educated population due to various initiatives taken by government like Sarva Shiksha Abhiyan (SSA), National Literacy Mission, and District Primary Education Programme (DPEP) etc. In order to serve the educated population with adequate information services and resources, government and other agencies have established public libraries throughout the country. Government of India established Raja Ram Mohan Roy Library Foundation (RRRLF) in Kolkata for the overall development of public libraries. RRRLF is a nodal agency to support public library services and system and promote public library movement in the country. It has also been given the responsibility for resource mobilization for modernization of the State and District central libraries, the development of infrastructure and training of personnel. In provides financial and technical assistance to public libraries to support public library development in the country.

According to the constitution of India public library development is a State responsibility. Therefore, all states in India are vested with mandate to set up libraries at different levels, within each state. But in fact, in India 19 states out of total 29 states and 6 union territories have so far passed library legislation, ensuring adequate funds and other resources to promote Public Library System in these states. The distribution of public libraries across the Indian states is show in (Table – 1)

Over the last thirty eight years the Foundation has covered over thirty-two thousand libraries at different levels:

State Central Libraries	28
Divisional and District Libraries	451
Below District Level Libraries	31155
NYK	594
Jawahar Bal Bhavans	49
Others	128
Total	32405

Table-1

Source: (www.rrrlf.nic.in)

RRRLF provides financial assistance to these 28 state central libraries in different cities. RRRLF promotes public library services all over the country with co-operation of State Government, Union Territory Administrations and other similar agencies (NGOs) working in this field.

The dimensions of public library services are not uniform in India. The size of state, the population, literacy rate, status of books produced in regional languages are some of the factors effecting the dimensions of public library services in a particular state. Administrative problems are also considerable factors as in some states rural library is categorized as public library and in some other states it comes under the jurisdiction of Adult Education Department or Public Relations Department. Rural libraries constitute 70% public libraries, are housed in single reading room with inadequate infrastructure, improper supply of books and untrained staff personnel. Hence, the major changes that are emerging in public library scenario are:

- Advances in new information and communication technologies, which can be viewed as a problem or opportunity.
- Increased demand for prompt and responsive information service.
- Funding and spatial constraints that limit acquisitions, storage, access and service options.
- Recruitment and attraction of staff with the potential to develop proficiencies in the new technologies.
- Communicating at a time when the traditional lines of communication are becoming altered and undefined/blurred by new electronic means.
- Inadequate infrastructure to render new update information services.

Information and communication technologies (ICT) provide new ways of interactive communication between public libraries and their users. It is hoped that new relevant technologies will enable public libraries to promote resource sharing. But access to ICT in India is marginal due to high cost of connectivity which results in deprivation of majority of population from its benefits. The main reason why the public library movement in India is lagging behind is lack of funds, lack of prioritization of government and no integrated approach of social welfare and community development. Hence the **major changes** faced by the public library system which prevent effective dissemination of information can be summarized as:

1. Technological Changes & Economic Pressure

Information Technology is one of the major factors causing changes in the way people communicate, locate, retrieve and use information. Now days public libraries are expected to utilize new technology to reduce or slow the rate of rise of costs of information in order to save space & man power and to produce new

methods of handling rapidly increasing amount of information. But, in fact the economic pressures are so severe that all such developments and expectations are seemed to be imaginary to apply to public library system in India. These economic pressures include:-

- Inflation in the cost of printed publications, which continues to be rising at higher speed.
- An explosion in the number of publications, particularly in the sciences; the wealth of scientific information now doubles every 12 years.
- Overhead costs for libraries, particularly costs for providing new building space.

The main sources of income for public libraries are the funds from government, charitable societies, public trusts and individual donations. These entire incomes combine with subscription charges from member libraries is not sufficient to meet economic pressure effectively.

2. Human resources & Cultural Changes

The new technologies are changing the inner working of the library. The human resources are still the asset of the library. They need to be thoughtfully and carefully supported through the changes brought out by automated environment. The computers are simply tools and above all it is people the administrators, librarians, para professionals i.e. the clerical workers who have to decide how best to use automation in their operation. Therefore sympathy, compassion, motivation, understanding, a sense of good timing, and leadership should become an important part of competency pack.

Indian society is of multi-lingual & multi cultural nature. In such type of society a sense of respect and regard for other linguistic and cultural groups is essential to strengthen the cultural unity in diversity. The new emerging technologies require a massive upgrading of human skills and the encouragement of critical changes in long established community cultural patterns. Public library being the centre of cultural life, must invest in facilitating the cultural changes that are taking place in the culture of community members to utilize the public library more effectively under the new environment. This new environment has caused the need to undertake the following actions:

- Introduce bibliographic instruction sessions in libraries to teach search & discovery approaches to information retrieval.
- Cooperative programmes between the academic and public library system, to develop local library network for sharing in house resources & obtaining documents.
- Knowledge management projects to provide information education & culture to have soothing effects to the working mind of each user according to his needs.
- Organization of functions and get-together meeting of different cultural groups to give vent to the aspirations and contributions of different cultures.
- Cooperation between the public library, historian archaeologists, literary persons and leaders of local areas for procurement & preservation of local cultural materials and thereby serves as a link between the past & the future.

3. Changes in Publishing World

On-line publication processes are also now easy, fast and economical and have a high chance to get popularity. These days' scholars, information professionals, educators turn easily to internet to share their knowledge and expertise. Every learner approach internet to search study material to complete their assignments/projects. Access to the internet has revolutionized the field of publication also. The new technological environment extends beyond the walls of a library.

The public library can be understood as the public access point to the "Information highway" which provides free access to these services thus playing the role of major access point to the benefits of digital age.

H.K. Kaul, Director of the Developing Library Network (DELNET), New Delhi, said "Our public library system in the country failed totally in bringing knowledge to the doorsteps of every individual. It is advisable for us to look at the problem afresh, especially when the computer and communication technologies have now become available to us at a minimal cost." (Kaul 2002).

Hence public libraries should come forward to provide free access to online information services, without the limitations imposed by time, location & storage capacity. There is a need to re-structure public library system in India to accommodate update information technologies in their operations.

4. Internationalism / Globalization

Another implication of technological growth is the blurring of borders between nations. The dramatic improvements in transportation and communications since the beginning of the 20th century have made the world a much smaller place. It continues to shrink as digital communications technology and broadband network reach more and more space. In order to cope with the new international environment, public libraries in India need to introduce international programmes to impart international standard facilities and information services to its users. These programmes should reflect the true aspects of international education and should ensure international standard learning environment for the users.

5. Changes in Public Libraries

Public libraries are increasingly delivering services in a technical environment. Under the new technological environment, public libraries must redefine their image and promote an active role for themselves in the higher education community. The challenges and opportunities for public libraries in this context can be:

- An expanding role of library staff in teaching users how to identify, selects, evaluate and retrieve information resources relevant to their needs.
- An enhanced capacity of the public library to create, organize and disseminate select sets of information.
- Development of core collections to support educational and learning programmes within the constraints of publication proliferation and price inflation.
- A continuing reassessment of sources that may be strengthened or diminished according to changing user needs.
- Flexible library leaders and information managers who develop the new skills throughout their careers.

In the case of India, public libraries have witnessed great changes associated with changes in Indian economy. Even if, public libraries now received funding in line with inflation, this would not have been sufficient to keep up with continuing growth in production and cost of new books and other resources. Books and journals have increased in price a good deal due to inflation for many years. As a result, no public library has received funds that could keep up with the on-going inflation, resulting in increasing pressure on acquisition.

How to manage change

There is a strong belief that future demands a more user oriented and flexible structure to allow its various components to be self directed and thereby more quick in responding to emerging changes.

Managing change is not a onetime activity, something to be done once and got out of the way. The implementation does not mean making structural and organizational changes but actually implies changing every day thinking and thereby working pattern of all library staff involved in the processes, which includes the following:

1. **New Professionals Hierarchy with New Management Style:**

The leveling of library hierarchy will enable the public library to cope with new responsibility without dramatically changing the manpower organization of the library. The public library can create a parallel scheme in which librarians should be treated on individual basis, rather according to their place and duties in the traditional hierarchy. A new model of organizational leadership should be developed to respond to and to induce environmental changes. The gradual shift in the principles guiding the organization of public library is as follows

Gradual shift in principles in organizational structure

General services	→	Specialized ,user based services
Traditional librarian skills	→	Communicational skills
Autonomy ,Objectives	→	Collaborative, outgoing

2. **Acquiring new Skills for Managing change**

The most important consequence of library automation is de-skilling of library professional labour. Many of the skills for managing change are implicit in the foregoing. In changed public library structure, performance must be measured, procedures must be cost analyzed, user's behavior must be studied, procedures must be made efficient and effective management of information must be set up. All staff should clear about objectives and should try to ensure that the total resources at their disposal are used to the best effect. Managing staff is one of the most important and critical areas in the process of managing change.

3. **The Role of Leader and effective leadership**

Coping with change and change management largely depends on the leadership style which librarians follows as no change can be effective without active participation of librarians as basic instrument of change. Effective leaders give a clear vision and direction about anticipated change to their professionals. They must be able to communicate their vision and sense of direction to their staff and they must be able to present them convincingly to the outside world. Librarians as effective leaders must be flexible enough to accommodate new circumstances without losing sight of their long term vision. They should be optimism and enthusiasm, which they convey to their staff. They should have energy and commitment and willingness and ability to listen. The leader's role in managing change is crucial as without an efficient leader. It is absolutely very hard to manage change.

4. **New Ways of Thinking under New Organizational Structure**

Staff empowerment and team work are the key ingredients to manage change .Managing electronic texts require librarians to develop new skills and new ways of thinking towards their work. Along with new skills, up to date knowledge- knowledge of political and economic environment, latest development in publishing world, innovations in IT field from new information media to networking. Keeping staff aware of all such development is too important and regular updating courses are desirable. Public libraries and library professional must be flexible and need to be ready for changes. Traditional library structure where multi-variable consideration involved in the purchase of electronic texts i.e. space, equipments, copy-right, funding, networking etc. are not adequately addressed should be flattened. Reallocations and ongoing staff development programmes are expected with the need of more public library personnel.

5. **How to manage people and How to Overcome Their resistance to Change**

When it comes to change, most librarians have to encounter employees' resistance. All employees will resist change at some point. Staff resist change because they are alienated, unmotivated or have lack of confidence in themselves to adapt to the change. Staff will feel more threatened than they probably do already, and in such circumstances they cannot be productive and forward looking. Even older, more traditional and conservative staff will accept change if

- the need for change is fully explained
- they see what sort of change is required
- they believe it is reachable
- they have the ability to achieve it
- they are involved throughout the process of change

6. **Understanding Needs and Training of User Population**

In addition to on-going staff development programmes, public library must recognize the importance of developing and training user population. Users must be cultivated for the new environment. Users must be encouraged to share their expertise and learn how to formulate new approaches in library–user integration. Users should be significantly informed how web resources could be recognized, in order to be of practical use to the students, teachers, researchers etc.

Conclusion

The world of information is undergoing rapid change. An information age is at a great turning point in the history of civilization. Despite of major technological advancement across the world, Indian public library system is in a depressed state and does not provide meaningful services to the masses. Public library development is uneven throughout the country as it varies so much within and between different parts of the country. In India where on one side, rural public library sector is underdeveloped with few services, on other side urban public library sector in Delhi, Chennai, Kolkata and major cities have well developed infrastructure. Broadly speaking, Indian public library sector has almost remained unable to introduce latest technologies in its working and thereby provide update services to its users. The neglect of proper investment in Public services by Government of India is main cause for slow growth & vast inequities in Indian society. An investment in public library services contributes a large in the achievement of social development and education goals.

The movement around the public library issue is rising in the country and keeps becoming less likely to stop. The time for enlightened action has come and if proper action is not taken, this moment may also slip away like others in the past. As India is a country of diversity, a range of different service models is needed. The governance of public libraries also needs to be explored in community and local based management structures. The national government should provide guidance and effective local solutions for implementation of various plans & recommendations of different commissions, country should be divided at village, district, state and municipality levels. Library and information professionals should come forward to study present library system and do their best to raise the potential of public libraries in India to use new information and communication technology and thereby transform reading rooms into an information/knowledge centre.

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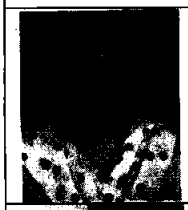
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Role of Aggregators for Academic Libraries: *A Conceptual Framework*

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This paper tries to clarify the varying roles of aggregators in Academic libraries. Aggregations are collections of publication in electronic form. Electronic aggregator's databases serve to aggregate or bring together electronic journal articles from different publishers. This article begins with a brief description and role of aggregators in Academic libraries.



E-resource, Aggregators, Information Gateway, Feed- Aggregator.

1. Introduction

Today's aggregators plays a vital role in Academic Libraries Every Libraries are required tailor based services and vendor-based collections. Growing demand for full-text aggregator databases increased collections of Academic libraries. Knowledge organisation in Successful organizations plays a crucial role in providing essential information to those who read it. Libraries too offered new strategy for information discovery and delivery in form of digital libraries and their collections and services. Quantity of electronic resources has increased, and automated and digital Libraries as well as commercial publishers are trying to enhance their existing services and develop new ones in order to meet needs of their customers for full text scientific material. Information aggregators whose job is to provide electronic content in full text, packaged and sold as single product, accessible to users by means of a single user interface and a comprehensive search system. The word aggregate means the total obtained by adding items together.

2. Aggregator : Concept and Definitions

Aggregator is defined as accompany that provides digitized access to the content of many different serials and other resources, often a variety of different publishers. Aggregators provide access to digitized material through a searchable database (CONSER,2002,P.6)

Martin and Hoffman: The aggregator is a vendor of publisher which gathers the content of dozens to thousands of serials titles and makes them available to a subscribing institution; an aggregated database is a collection of electronic resources from separately issued publications, assembled as a convenience to libraries and other subscribing institutions.

In Academic libraries the term aggregator is used to describe two different types of electronic resource:

1. Some aggregator is an electronic version of an abstract/ citation type of print resource such as Humanities Index.
2. Destination aggregator is an amalgamation of journal articles such as JYSTOR. An Open-URL link resolver connects enabled abstract/ citation source aggregators to destination aggregators.

An aggregation is defined as a collection of e-contents in full-text, packaged and sold as a single product, which is accessible to users by means of a single user interface and has comprehensive search system. Aggregators act as a mediator between publishers and subscribers for providing online access. They manage the electronic resources and provide online access to e- journals published by various publishers.

3. **Types of Aggregators in Academic Libraries:**

1. **Hosting aggregators**: Ovid, Silverplatter, Dialog, CatchWord, Highwire Press, Allen press, the American Institute of Physics, the hosting services of Ingenta and soon.
2. **Gateways aggregators**:

   Subscription Agencies as Gateway Service Providers:Swets Net, RoweCom, Informatics

   Traditional Abstracting & Indexing ProducersISI,BIOSIS,CSA,INSPEC

   Third Party Link Service ProvidersCross RefSFX from ExLibris

3. **Full-Text Aggregators**

   Annual Lease Access models-ProQuest, EBSCO

   Perpetual Access models with archiving space for the Library-Ovid, OCLC

- **Special-based aggregators:**
- **Credo Reference:** It is an independent aggregator, founded in the UK. Credo is unique because it focused entirely on reference works; subject matter includes monolingual and bilingual dictionaries, arts, social sciences and science. Credo was founded in 1999.
- **Questia Media:** It is the Houston-based aggregators. Questia Media is an online aggregator its service provides at end users. It is targeting the majority of students who did not buy course titles in print.
- **Myi Library:** Myi Library is a UK-based library aggregation service owned by US-based Ingram Digital Group.
- **Dawsonera:** Dawson books is a long-established UK-based supplier of Print volumes to libraries, this service from Dawson books provides 40,000 e-book.
- **JSTOR:** is not-for-profit organisation aggregators. It was founded in 1995. JYSTOR is the US equivalent of JISC (UK- based organisation providing technology for higher and education). JYSTOR provides royalty-free non-exclusive perpetual license to publisher's content. JISC provides an Academic database assessment tool at http://www.jisc.adat.com/adat.home.pl.This site provides Information e-book aggregators e.g. E-book Library,MYI Library,Netlibrary and ebrary. JYSTOR helps a publisher license agreement defined range of generally three to five years in which the most current issues of a title are not provided.
- **Corporate aggregators:** Dowjones, Factiva and Bloomberg.
- **Books 24/7:** is a part of e-learning company SkillSoft. It is one of the smaller general aggregators, with more than 21,000 titles available, many of them grouped in professional areas such as business, Engineering, Information Technology and Finance.
- **Content aggregator**: is an individual or organization that gathers Web content (and/or sometimes applications) from different online sources for reuse or resale. There are two kinds of content aggregators: (1) those who simply gather material from various sources for their Web sites, and (2) those who gather and distribute content to suit their customer's needs.
- **Factiva**: provides business news and information together with content tools and services gives information limited to students, faculty, and staff of the University of Texas at Austin.
- **Subscription Cum aggregators:** Ebsco and Swets
- **Portal cum aggregators:** Biomednet,J Gate.
- **Academic aggregators:** EBL,ebrary.
- **Full-text content:** Adonis,Ebsco publishing,UMI (Bell and Howell).
- **Subject-based aggregators**: are those that can include publications from various publishers but are related in that they share broad subject, whether Business, Medicine, Law e.g. MEDLINE, it is a health care-related scholarly journal articles.

- **E-Books Aggregators:**
  Many publishers offer e-Books directly, without the aid of aggregators, and through their own platforms, some of which includes:
  - Wiley – Blackwell
  - Ovid
  - Springer link
  - Taylor & Francis
  - Inform world
  - Emerald
  - Royal Society of Chemistry
  - Elsevier
- **Web-Based Feed Aggregator:** The Web-based feed aggregator was designed on open source tools e.g. World Press, Apache, PHP, MY SQL and OPML (Outline Processor Markup Languages) allowing full feed data control and source code to the users. Aggregators feeds are designed for delivering web content updates, and referred to RSS (Really Simple Syndication). Aggregators can be browser based, web-based, desktop based or mobile based.
- **Some Important Web-Based Feed Aggregator:**
  - **MY SYndicaat**: it is web-based aggregation and helps to searching and update content aggregation, context editing, context classification republishing, configuration management.
  - **Super Feedr:** it is based on the publisher- subscriber process of feed notification and update.
  - **Rsslounge:** is an open source web-based feed reader developed by Tobias Zeising. It also helps for image blogging and hosted locally source codes.
  - **E-learning:** Moodle, A Tutor, Dot learn.
  - **WP RSS aggregator:** This aggregator feeds are sorted by dates ordering from the latest to the oldest.

4. Advantages of Aggregator

- Aggregators even facilitate searching across multiple databases.
- It also serves both Producers and libraries by combining complementary products in packages that are easier to sell and buy.
- Aggregators facilitate the diversity of publication from large numbers of publishers.
- It also helps in libraries to handling orders, billing, payments, renewals and cancellations.
- Aggregators provide access to thousands of Online Journals from leading Scholarly. Academic and business publishers and provide fast and reliable access from a global Network.
- Through negotiation the aggregator's lowers the overall costs and at the same time provides access to larger amounts of information.
- Aggregators control price stability.

5. Disadvantages of Aggregator

- Lack of library influence in selecting individual titles.
- Lack of control over the contents of aggregator package.
- It creates confusion of library users when accessing different packages.
- Aggregators frequently change their journal lists or the years of coverage without notify the subscriber, and finally library loses control over the collection.
- Lack of persistent URLs.

6. Conclusion

Aggregators also have the advantage of a larger user-base that is extremely receptive to the idea of full text. The biggest problem for aggregators is that they do not typically own data and creating licensing issues. The aggregators are in a very good position to make connections not only between publisher products but also between customer's site and the aggregated material. Flexible and diversify, multifaceted services for patrons/users would be the way to accommodate the diverse formats of scholarly journals. This paper provides readers with basic information about role of aggregators in academic libraries.

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Role of Digital Library in Social Sciences

Rameshwar Dayal



This paper discussed the role of digital libraries in social sciences. It includes the discussion on the concept of digital library and its advantages and problems, the concept of social research, important of information resources, information needs and seeking behaviour of social researchers were also discussed, the results of observational method conducted in some universities researchers in India also discussed.



Library, digital library, social research, Cafe Construction Kit.

1. Introduction

We build the digital library; we need to be careful not to carelessly obliterate some of the important features of current libraries. Many proposals for digital libraries remove social exchange and interaction, focusing narrowly on the technical mechanisms of information access. This is not only unwise, it is unnecessary since we could provide mechanisms for social exchange and interaction within our systems. Simply put, we do not need to remove the social world from our systems. This paper discusses why such interaction is important, and then presents a toolkit, called the Cafe Construction Kit, that can provide computer-mediated communication support at low cost.

2. The digital library as ideal

A digital library can be built around specific repository software an example of these are Dspace, Eprint, Fedora, dlibra and Greenstone Digital library software. Martin (1992) stated that the digital library became a standard way of describing libraries that offer access to digital information using a variety of network including the internet and the world-wide-web (www). Digital library is to be an electronic collection of real or virtual resources, which may also be available elsewhere. Clearly, the promise of the digital library is enormous [6, 7]. In the ideal, an information seeker can have access to materials whenever and however he wants it. There will be no shortage of copies, retrieval can be instantaneous, and the materials will not decay or fade. One would never need to trudge in the snow to the library. In short, the idea of the "digital library" includes solving many of the technical and logistical issues in current libraries and information seeking. Despite this promise, the digital library, if improperly considered, could lead to a problematic future. The scientist in the beginning quote inhabits such an environment. Many of the scientists at this research site have spoken with wistfulness about the past, remembering themselves in a single physical room. They do not want to go back; they do not want to lose the independence of separate workstations. But, they do miss the camaraderie and social cohesion furthered by the interaction in that room. Such interaction is too easily lost and regained only with great difficulty. Considering only the mechanical aspects of access can lead to ignoring the positive and useful social interactions in information seeking.

3. The use of social interaction in information environments

Importance is an effective digital library would mean the availability of information resources needed by social researchers and professionals. Social interactions can be quite helpful to information seekers in four ways. First, one may need to know what to know. In general, it could be argued that as access to material becomes easier, emphasis will shift from the mechanical aspects to knowing what material to access. If we can have every book in the world, we will need to know what handful of books to read. *Help in selecting materials* can be alleviated through technical means (e.g., better navigation methods, critical annotations by well known scholars, and voting). Nonetheless, one may need to have the help of other people as well. For example, it is often easier to ask another person, since interaction can refine questions and tailor answers [1, 10]. Second, social interaction is helpful in providing mechanism for *seeking informal information*. Informal

information includes unofficial information such as technical fixes, organizational work-arounds, and personal correspondence [11]. Because this information is often quite volatile and transitory, it seldom written down, let alone indexed. Other people are often the only source of informal information. Current libraries do not handle this type of information seeking, but digital libraries could [2]. Third, information seeking is often ad-hoc and highly contextual [8, 12]. *Information seekers often have highly specific interests and needs.* It is often more simple and efficient to go to others for information than to written materials. Allen [3], in his classic study, noted that R&D engineers eschewed the formal literature, going instead to colleagues and the trade press for the information they considered necessary. Again digital libraries could provide this functionality. Fourth, current libraries do have some important – and useful - social functions. For students, the university library can have an important *socializing function.* Students meet one another and talk in the hallways and canteens, and faculty members bump into colleagues in elevators and stacks. Libraries serve as a place to co-learn (e.g., in study groups). Moreover, community libraries offer a number of social outreach and care programs. Many of these useful social functions exist secondarily, as by-products of the library's information access goals. Nonetheless, they are not only useful functions, they also make life more pleasurable and rich. There is some evidence that such exchanges and interactions provide a 'glue' for communities. Fischer [5], while examining people's sense of community in urban and small-town settings, found that the density and public nature of social interaction may be a critical feature for people's perceptions. Certainly, there is little sense of community in sitting at one's workstation. The above arguments - the need for help in selecting material, the desirability of informal information, the adhoc and contextual nature of most information seeking, the personal enjoyability and community benefits from social interaction - all argue for the inclusion of some form of social interaction within the digital library. Such interaction should include not only librarians (or some human helper), but other users as well.

4. The Cafe Construction Kit

The goal of the Cafe Construction Kit is to provide a generic interactive communications toolkit for supporting the easy construction of applications such as digital libraries and other CSCW projects. In short, the Cafe Construction Kit provides a toolkit for sociality. The Cafe Construction Kit provides a set of reusable objects that include message transport for asynchronous and synchronous communication, parsing for a variety of semi-structured protocols, private and public channels for narrowcast communication, message filters, and message retrieval by a variety of semi-structured methods. The Cafe Construction Kit is programmable through the TCL programming language [9]1 By configuring the objects and providing the suitable TCL program, *any* application can include the functionality of bulletin boards, chat systems, and electronic mail filters. Additionally, we are actively working on providing the important construction facilities of MUDs [4], so that users can interactively and collectively construct information access methods and environments.

Because of this emphasis on providing building blocks for social interaction, the Cafe Construction Kit can provide a range of social functionality to digital library applications. It can also serve as a platform for testing various heuristics for interactive information seeking, where users work together to find, create, maintain, and store new information and knowledge. The current version of the Cafe Construction Kit is still in prototype. An earlier version exists and was tested on small-scale problems. The first version showed that it was possible to provide a flexible, distributed construction set for interactive communications. However, informal user studies of the first version argued for a better command language (hence, TCL), using a standard synchronous protocol (hence, the use of NCSA's Data Transfer Mechanism), user interface support for the interactive communication objects, and careful attention to scalability issues. The second and current version is under construction: The core objects (written in C++ and connected through the TCL interpreter) exist and work, but more work is needed, primarily on the user interface components.

Some corporate and agencies are providing online or perpetuate access databases for journals articles, magazines and e-book to libraries on subscription basis. A few names are given hereunder:

- J-Gate

- Delnet
- IIT -Dest
- Elsevier
- Emerald
- Sci-Direct
- Online Library Subscription
- EBSCO
- E- Book Publishers
- JSTOR
- Indiastat.com
- Sage online journals
- Oecd-library- Balani Infotech
- ACM Library

5. Advantages of Digital Libraries

- **No physical boundary:** It is available across the globe.
- **Round the clock availability:** User can access the information (24x7) at anytime night or day.
- **Multiple Accesses:** The same resource can be used simultaneously by a number of institutions and patrons.
- **Information retrieval:** The user is able to use terms (word, phrase, title, name and subject) to search the entire collection.
- **Preservation and conservation:** Digitalization is a long term preservation solution for physical collections.
- **Space:** Whereas traditional libraries are limited in storage space, digital library have the potential to store much more information simply because digital information requires very little physical space to contain them and media storage technologies are more affordable than ever before.
- **Automation:** A digital library is also not merely an automated conventional library, where the resources are electronically catalogued and are available only for browsing purposes.
- **Manpower:** It saves the manpower in duplication.
- **Global Opportunities:** The global community is at your fingertips with online learning. The technologies use to give online instructional designers and ability to build in tools that takes you to resources you may never see in a traditional classroom.
- **Added value:** Certain characteristics of objects primarily the quality of images may be improved Digitalization can enhance legibility and remove visible flaws such as stains and discoloration.

6. Conclusion and Future Work

This paper has argued that the design of a digital library does not have (and should not try) to eliminate the social world. Quite simply, there are important elements of the social world, including a sense of community that we do not want to lose from our notions of "library". Many social mechanisms are important and useful in information access, and social interaction provides an enjoyable and community-building function.

This paper briefly presented a toolkit that makes it easy to add social functionality to applications such as digital libraries. The Cafe Construction Kit provides auxiliary mechanisms for seeking and locating information without adding significant programming or computational overhead. Most importantly, using the social interaction capabilities of the Cafe Construction Kit should make digital libraries and similar applications more pleasant to use a worthwhile goal.

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Semantic Web: An Overview

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The paper gives an overview about the Semantic Web building blocks, its applications, and proximity of semantic web with library services and its relationship with web2.0. and about semantic search and information retrieval. The paper identifies the components of semantic web and its application in the field of e-commerce, social networking and knowledge management. It discusses its application in digital library i.e semantic digital library and web 2.0 emphasizing the need to form communities and also be more social in sharing knowledge and information. The new community that will arrive will be social semantic. Technologies of Semantic web like RDF may set a framework to model any kind of metadata and can deliver it to certain level of technological interoperability as well as provide flexibility and functionality to semantic web tools and applications.



Semantic web, Knowledge management, social networking, social semantic library, information retrieval.

1. Introduction

The semantic Web (Berners-Lee et al. 2001)[1] has been proposed as an extension of current web, in which information is given well-defined meaning to better enable computers and people to work together. Simply Semantic Web is able to describe things in a way that computers can understand.

2. Semantic Building Blocks

Ontology: Ontology is an explicit specification of a conceptualization. The term is borrowed from philosophy, where ontology is a systematic amount of existence for all systems, what exists is that which can be represented.

- **Types of Ontology:**There exists different ontology built for different types of applications based on generality of their uses it has three types:
- **Generic or top level ontologies** are applicable to many technical domains. Ex-WorldNet and Cyc.
- **Domain ontologies** captures knowledge in a specific domain Ex-UNSPSC-product classification scheme for vendors.
- **Application ontologies** captures knowledge necessary for special application.

3. HTML , XML, RDF, OWL

Hypertext Markup Language the mark-up standard for web pages is a display format that does not record the underlying structure of the data. The semantic web uses the resource description format (RDF) to describe data models, including objects and relationships between objects. The range of objects is very wide and includes people, meetings and products in addition to text, image and audio documents. RDF converters convert from application specific formats for ex-MARC, JPEG, XML, EXCEL, Flickr: etc. To RDF (Herman 2007)[11]. OWL web ontology language adds more vocabulary for describing properties and classes. Ontologies facilitate integration of resources where different identifiers are used for the same concept for ex- " author" and "creator". Extensible Markup language provides a basic syntax for content structure. It does not deal with meaning. XML schema is a language for describing the contents and structure in XML documents. SPARQL is a protocol and query language for resources in the semantic web .

- **Standard Ontolology Language for Web services**
- Simple Object Access Protocol (SOAP)
- Web Services Definition Language(WSDL)
- Universal Description Discovery and Integration (UDDI)
- Web Ontology Languaguage(OWL)
- DARPA Agent Markup Language + Ontology Interchange Language (DAML+OIL)

4. Semantic Web Applications

- **E-Commerce:** Semantic web has found a prominent place in e-commerce in terms of relevant data, exchange of information between different agents, filtering of relevant information for finding good business sites or analysing market trends, online advertisements, multimedia collection , exchange of machine dialogue across the domains, virtual community and vocabulary facility standardization. (ICEIS 2003)[17]. Information exchange among business processes take place through web services. Web service is a self contained, self describing software system which supports interoperable machine to machine interaction. With the use of semantic web tools interoperability as well as flexibility of different business processes has increased resulting in better and meaningful flow of information.

- **Semantic web in social-networks:** Social Networks or virtual communities have a crucial role in present day scenario in the form of representation of relationships between individuals and groups in the community. It connects people across world through social networking sites like Facebook, Orkut, Linkedin, Myspace etc. The communication technologies and infrastructure used to support virtual communities have evolved with the internet and include mailing-lista, bulletin boards, wikis, podcasts etc. But there are certain limitiations in terms of interoperability among different social networking sites i.e sharing of profle data among different sites, privacy issues, connections or relationships between common interest profile holders. Several of these virtual communities have started publishing public profile information including social links, using semantic web language RDF. Most use RDF vocabulary defined by the Friend of a Friend (FOAF) ontology augmented with new terms as needed. The use of widely known non-proprietary shared ontology for this information enables interoperability among these systems Finin,Tim(2005)[7]. FOAF consists of machine readable pages used to describe people their activities and their relationships with other people and objects. It connects social networking sites and the people it describes using a decentralised database. The semantic web provides exciting potential for extension of library services.

- **Semantically Linked Online Communities:** The SIOC initiative aims to enable integrate online community information. It provides semantic web ontology for representing information in social web like blogs, discussions forums, wikis, photo galleries, shared bookmarks, aggregated feeds etc. SIOC is used in combination with FOAF ontology for defining user profile and social networking information.

- **Semantic web in Knowledge Management:** Knowledge Management comprises a range of practices used by organisations to identify, create, represent and distribute Knowledge. With the advent of WWW, though it has given access to plethora of information in form of knowledge repository but also thrown challenges like information overload, heterogeneous information, information present in natural language and geographically distributed information effecting search, access and retrieval of data and information by a wide variety of users. Semantic web is useful for knowledge management because it helps people to find and correlate information irrespective of their source and type. This is provided with the help of XML tags which provides structure, metadata descriptors through use of RDF and relationships with the use of ontology language. The background information is provided by ontologies through which description of data is strengthened and the meaning of information in context is much more clear and effective. Shared terminologies increases interoperability, but also give rise to different ontologies defining the same concept. To tackle this

problem mediation is required in semantic Knowledge management for data sharing among heterogeneous knowledge databases.

- **Semantic Web and Library services**: On the one hand libraries are doing the core jobs of collection development, cataloguing, reference and circulation. Semantic web on the other hand synchronizes with the core activities in the form of web automatically collecting web documents from diversified sources and integrating and processing it for the users. Regarding the **cataloguing process** of libraries , at one end of the continuum different bibliographic data has been represented applying different standards for ease of search and retrieval by the users and at the other end semantic web provides different ontologies to process information and find meaningful information from diverse web documents. The primary objective of reference is to provide pinpointed information exhaustively and expeditiously. The semantic web alongwith these building blocks like XML, RDF, OWL, structured metadata has been facilitating knowledge and resource discovery. In library **circulation** membership is required for borrowing books. Similiarly in semantic web there are rules of accessibility of the resources accessed by the user Greenberg, Jane(2007)8.

- **Semantic Web and Digital Library:** Digital library is a library in which collections are stored in digital formats and collections are accessible by computers. Social semantic library involves community into sharing information. Semantic Digital Library is accessible by machines and not only with machines. Semantic Digital Library will integrate classic digital libraries with semantic web and social networking and other web 2.0 technologies. Some of the libraries are: BRICKS, SIMILE, JEROMEDL, FEDORA. These libraries cope with semantic technologies by integrating ontologies and RDF schemas.

As we know web 2.0 is an informal flexible way of integrating diverse web services. It focuses more on user interface rather than on technology and standards. Web 2.0 applications include social networking sites like facebook, Myspace alongwith collaborative tagging which encourages users of information to create, share, collaborate and interact. The two approaches can be integrated with a semantic web back end and web 2.0 interfaces. Decker (2005) clarifies:

"The semantic web effort itself does not provide application it rather provides standards to interlink applications. So for web 2.0 semantic web recommendations provide a way to interlink applications.And active area of integration of semantic web and web 2.0 is SPOARQL query language which was developed as query language for RDF in semantic web.

- **Semantic Web based information Retrieval:** Semantic information can be annotated in web pages using enhanced metadata description languages. SHOE (Hefflin et al. 1998) has enhanced the HTML language to enable users to annotate ontology based information onto webpages with the development of semantic web portals. One of the major challenges of library portals is to make interaction possible between a portal and any number of target resources. Metalib from Exlibris is an example it makes use of an underlying data repository. Esperonto (2006) and OntoWeb (2006) are academic portals that provide academic knowledge mainly to industrial partners. Empolis K42(2006) and Mondecca ITM(2006) are commercial portals targeted at knowledge management in business.Probably there are many types of knowledge provided from different semantic web portals, it is still not easy for a retrieval system to laocate semantic web services automatically. To tackle this problem an intelligent agent called matchmaking agent (Bansal &Vidal (2003) or matchmaker agent (OWL-S 2006) can be used.

SWOOGLE (Ding et al, 2004) is a semantic web based search engine that user's crawlers to collect intelligent agents ainformation provided by existing semantic web services over thewweb, the collected information is indexed for information retrieval.

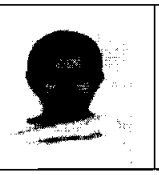
To overcome limitiation of citation based tretrieval system the use of semantic web for citation tretrieval has been proposed This system is known as Scholarly Semantic Web (or SSWEB). It is developed to provide access to scholarly ontology for scholarly information retrieval.

5. Conclusion

From semantic search to semantic web and from semantic marketing to semantic technologies, it seems everyone wants to ride the semantic train. It will make a transition to a web where we will stop searching and start finding. Although many developments have taken place in the form of semantic digital libraries, semantic knowledge management and social networking, semantic web searching, semantic portals and information retrieval. Further, researchers would need to focus on developing semantic web standards like new ontologies and taxonomies to give a wider yet unified and flexible approach to huge data on web.

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Electronic Books (e-Books): *A New Horizon for Libraries*

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Growth and development of web technology has increased the popularity of e-books and the libraries and information centres are trying to build a collection of e-resources in order to provide need based services to its users. The present paper briefly discusses about the e-books which has now a days become an important e-resources for the libraries. The paper includes the definition of the e-books, types of e-books, information about the important providers of the e-books and its advantages and disadvantages.



E-books. E-resources

1. Introduction

Now-a-days with the increasing number of electronic resources become available, retrieving relevant and authoritative information has become progressively more challenging and time consuming. Locating relevant information in a timely manner is critical for both the researcher and the information professional. E-books are one of the latest technological evolutions in the development of communication technology. It has enhanced the digital library services to enable users to quickly retrieve and access specific research material easily, quickly and effectively. They helped the library systems to streamline library operations, as well as promote user adoption. Usually the content is available in PDF, HTML, epub, XML, RTF etc formats which makes the contents much more versatile and flexible than the traditional book. E-Books have features like search and cross reference functions, hypertext links, bookmarks, annotations, highlights, multimedia object and interactive tools.

E-books were invented in 1971 by Michael Hart, a student at the University of Illinois. He later went on to found Project Gutenberg, the first and largest collection of free e-books available online. The first commercial e-book was launched by Random House in 1981. By the mid-1990s, e-books were beginning to be seen as a legitimate alternative- and also as a potential threat- to traditional print publishing (DeSouza, 2004). From 2005 onwards, it again got momentum and from 2007 onwards, it started flourishing. Now it has become one of the emerging technologies which has wider impact on teaching, learning or creative enquiry on college and university campuses.

2. Types of e-Books

The e-book arena is in a state of flux and the concept of an e-book is not attached to one single medium in the way that DVDs and CDs are. Therefore it is better to introduce a classification of the various types of e-books. Hawkins has identified four types based on content, availability and access, while Crawford identified nine types based on proprietary formats, standards, media form, length of contents and access. These are listed in Tabale 1 with their characteristics (Subba rao, 2003):

Tabale 1 - Types of e-Books

E – books	Characteristics
According to Hawkins Downloadable e-Books	Contents are available on the internet for downloading to the user's PC. No special device is required
Dedicated e-.Book	Contents are downloaded to a dedicated hardware device with a high quality screen and special capabilities for book reading

Web accessible e-Books	Published on the provider's Website and may be accessed for a fee or purchase the books to receive indefinite access
Print on Demand e-Books	Contents are stored in a system connected to a high-speed, high quality printer and bound copies are produced on demand
According to Crawford Proprietary e-book devices	Text is downloaded in proprietary formats that are locked in a single reader
Open e-Books	XML based standard that allows any text to reside on any reader. Potential reading devices include PCs, palmtops and note-books etc.
Public domain e-Books	Digital copies of books available or text placed in public domain for free downloading, printing and circulation
Pseudobooks	Titles bought by libraries or consortia and loaned out to users to download their own PCs.
Instabooks	Books printed and bound on-demand from fully marked up digital texts or scanned page images stored digitally
Not quite a book	Mid-length texts that are not suitable to publish in print media. Converted to PDF, packaged, e-published and e-distributed
E-vanity and self-publishing	Books published by individuals on the Web
e-Books before the Web	Books on CD-ROM
Extended books	Published on CD-ROM or Web, offering searchable text through hypertext, multimedia and interactive elements

3. e-Book Providers and accessibility

Electronic books are accessible through the Web in varied form. Generally they are texts that have been scanned or typed which are either published on a Web server or made available on the Web for downloading. These can be free access or access on payment. Some of the important websites which provides e-books free and some of the important websites which provides e-books on payment are discussed below:

- **Free Access**
- **Project Gutenberg** (http://www.gutenberg.org/): Project Gutenberg (PG) is a volunteer effort to digitize and archive cultural works, to encourage the creation and distribution of eBooks. It was started by Michael Hart in 1971 and is the oldest digital library. Most of the items in its collection are the full texts of public domain books. The project tries to make these as free as possible, in long-lasting, open formats that can be used on almost any computer. As of March 2013, Project Gutenberg claimed to have over 42,000 items in its collection. The site has browsing facility by Author and by Title. Author wise list of e-books are available at http://www.promo.net/pg/authors.zip and Title wise list of e-books are available at http://www.promo.net/pg/titles.zip.
- **Bartleby.com** (http://www.bartleby.com/): It was founded under the name "Project Bartleby" in January 1993 by Steven H. van Leeuwen as a personal, non-profit collection of classic literature on the website of Columbia University. It is a comprehensive, searchable database of reference, verse and classic literature, summaries of each book, and author biographies, having enhanced navigational tools and extensive cross-referencing. No access fee is charged.
- **University of Virginia e-book library:** On this site more than 1800 publicly available e-books including classic British and American fiction, renowned authors, children's literature, the Bible, Shakespeare, American history, Afro-American documents, and much more are freely available. (http://etext.lib.virginia.edu/ebooks/ebooklist.html)
- **University of Illinois E-Book** (http://www.press/ illinois.edu/epub/books.html): The University of Illinois Library has thousands of free eBooks mostly with full content that can be accessed anytime.

The books can be accessed through author, title and subject. It also provide facility of keyword searching to enable user to locate specific information.

- **University of Pennsylvania online book** (http://online books.library.upenn.edu): The University of Pennsylvania online book page facilitates access to e-books that are freely readable over the Internet. This site includes different sections like books online, news, features, Archives. It includes more than twenty thousand free e-books on the web in various formats. All of the books are free for personal and noncommercial use. Users can search the book through author, title, subject and serial archive.
- **National Academic press** (http://www.nap.edu): National Academies Press was created by the United States National Academies, to publish the reports issued by the National Academy of Sciences, the National Academy of Engineering, the Institute of Medicine, and the National Research Council. It publishes nearly 200 books a year on a wide range of topics in the science, engineering, health including the most authoritative view on important issues in science and health policy. The institutions represented by NAP are unique in the sense that they attract the leading experts in every field to serve their important panels and committees. Presently more than three thousand online books are available free.
- **Web Book Publications** (http://www.web-books.com): All the titles on this website are free for online reading and can be downloaded in EXE or ZIP formats. The EXE format can be read by Internet Explorer on Windows 95/98/XP. The ZIP format is a collection of HTML files which can be read by any web browser on any device, such as notebook, Smartphone etc. Currently more than seven hundred titles are available free.
- **Digital book Index** (http://www.digitalbookindex.com): Digital Book Index provides links to more than 165,000 full-text digital books from more than 1800 commercial and non-commercial publishers, universities, and various private sites. More than 140,000 of these books, texts, and documents are available free. The coverage includes : Reference Books, Literature & Languages, History, Social Sciences, Medicine & Health, Math & Sciences, Philosophy & Religion, Law, Children eBooks etc
- **Access on Payment**
- **Questia** (http://www.questia.com): **Questia** is an online commercial digital library of books and articles with an academic orientation, with a particular emphasis on books on humanities and social sciences. The great majority of items are under copyright, for which Questia has paid a fee to the copyright owners. All the text in all the Questia books is available to subscribers. Questia does not sell ownership to books or e-books, but rather sells monthly or annual subscriptions that allows temporary online reading access to more than 78,000 online books from reputable commercial and academic presses. This rich, scholarly content selected by professional collection development librarians is not available elsewhere on the Internet.
- **Springer e-books** (http://link.springer.com/): Springer e-book platform makes the accessibility of its online e-book collection easier and more convenient for subscribing institutions. The subscription requires IP based authentication. Springer e-books currently includes books in mathematics and statistics (11579), Physics (8745), computer science (11370) Life science (9904), engineering (6746) and reference books (194) totaling 48344 e-books.
- **Bernes and Noble.com** (http://www.barnesandnoble.com): Barnes & Noble, Inc. is the largest book retailer in the United States, operating mainly through its Barnes & Noble Booksellers chain of bookstores. headquartered in New York City. It carries downloadable e-books in their E-Book section apart from the book in the form of CD-ROM and DVD-ROM. On January 8, 2014 it was announced that Michael P. Huesby would become the new CEO of Barnes and Noble.
- **Word Wrangler** (http://www.wordwrangler.com): Known for providing excellence in eBooks, Word Wrangler publishes in all genres, traditional and non-traditional, other than works which contain

deprecatory material concerning gender, race, or religion, Children's, Fantasy, Historical, Mainstream, Media, Mystery, Poetry, Romance, Science Fiction, Speculative Fiction, Western, Young Adult, Non-fiction. It also lists eBooks for self-publishing authors and other publishers in its bookstore. Word Wrangler offers a POD (print on demand) option separate from their e-publishing sector and also a cover-design service.

- **Palm digital media** (http://www.peanutpress.com): Palm Digital Media is the first electronic book publisher to offer contemporary fiction and non-fiction books for reading on handheld computers or Palm handheld platform. Palm Digital Media has relationships with more than 75 publishers, including industry leaders HarperCollins, Penguin Group (USA), Random House, St. Martin's Press, Simon & Schuster and Time Warner Book Group. It offers more than 10,000 e-book titles.
- **Sage e-books** (http://knowledge.sagepub.com/): SAGE Knowledge is the ultimate social sciences digital library hosting 3332 titles, it includes an expansive range of SAGE eBook and e-Reference content, including scholarly monographs, reference works, handbooks, series, professional development titles, and more. The platform allows researchers to cross-search and seamlessly access a wide breadth of SAGE book and reference content from one source.
- **Taylor & Francis** (http://www.crcnetbase.com/): This site offers instant access to the world's premier Humanities, Social Sciences, Behavioral Sciences, Built Environment, STM and Law content - from renowned imprints such as Routledge, Psychology Press and Focal Press. They have more than 40,000 titles available for institutions via their eBook collections - from general subject areas to interdisciplinary selections. The broad subjects includes : Business & Management, Communication and Media Studies, Counseling and Psychotherapy, Criminology & Criminal Justice, Education, Engineering & Materials Science, Geography, Earth & Environmental Science, Health and Social Care, History, Life & Biomedical.
- **Cambridge University Press** (http://ebooks.cambridge.org/): Cambridge University Press is one of the largest and most prestigious academic publishers in the world widely respected as a world leader in publishing for subjects as diverse as astronomy, Shakespeare studies, economics, mathematics and politics. The Key Features are: Dynamic content and feature set, frequent addition of new titles and regular functionality enhancements, titles from across all Cambridge world renowned subject areas, powerful quick search, advanced search and browse capabilities.

4. Advantages and Disadvantages of e-Books

The e-book has been around for a few years and it has caused a stir. It has many advantages and disadvantages in comparison to the printed book.

- **Advantages**
  - The main advantage of e-books is that it is mobile. E-books help to move the library into the new century of digital Library and virtual library capability, cheaper, space saving, offers 24/7 access and availability, remote access, full text search capability, as well as copying and pasting.
  - Never lost or damaged this means that e-books are not physical items which can be lost of physically damaged as they physically cannot break as they are electronic resources.
  - Human Saving, this means that essentially we are saving on time and access meaning that individuals do not have to wait two weeks in order to have access to a book.
  - Low Security risks as they cannot be stolen,
  - Computer Viruses cannot be transferred via e-book formats,
  - Hacking attacks from outside sources through e-books are limited and non-existent as the e-books cannot be hacked due to digital rights management.

- The adjustable text, i.e. the ability to enlarge and shrink text as needed by the user. (Pavlik, 2008).
- Many e-books include different multimedia effects, such as written text, oral reading, oral discourse, animations, music and sound effects. (Korat and Shamir, 2007).
- E-Books offer accessibility, flexibility, and search ability in ways print cannot
- In terms of retrieval and usage, e-books are relatively simple to retrieve, convenient for resource sharing, and have lower compatibility requirements.
- They have the ability to be accessed by more than one user at a time. The multi-user capability has great implications especially for libraries whether public or academic which work with many users.
- E-books have the capacity to merge multiple technologies such as speed technology, Bluetooth 2.0, clear type technology, read aloud text to speech capability and many more other technologies which will enable users' better usage of the books.

- **Disadvantages**
  - Apart from the e-Books advantages there are still a few deficiencies and vulnerabilities.
  - Physical and mental strain: continuous reading of an e-book sitting in front of computer system affects the eyes and nerves.
  - The expenditure on an e-book is the sum total cost of e-book plus access charge plus internet connectivity and usage charges which is costlier than a printed book.
  - There is a restriction on electronic equipment, internet reliability, fragment reading, and compatibility of software.
  - Other disadvantages are navigation implications on an e-book device and unreliable life span in terms of long term digital storage
  - The concept of the reader's first edition will be lost due to the fact that one digital copy cannot be visually different from the next.
  - When the electricity is out and the battery runs flat, one cannot read the e-book(s).
  - If a certain format is discontinued, one may not be able to acquire the new titles, especially if the reader is locked into that format.
  - Lack of standards does not allow reading all of a library's e-book titles (from different publishers) through a single interface.
  - Standardization of reading devices is yet to be achieved to enhance the readability of e-book readers. Apart from all these they are not at par with print books in comparison to ease of reading

5. Conclusion

The production and usage of e-books is growing at a fast pace and warrants serious consideration, especially in libraries and information centers of Indian universities, institution of higher education, IITs, NITs, IIMs and organization of national importance. Library users have become more advanced and their expectations are changing as they become more information oriented and more dependent upon information and communication technology equipments. It is not likely that e-books will ever be able to completely and totally replace print books, nor should they, as e-books are yet to become a major form of publication and the

number of e-books published are much less as compared to print books. However, the print book market will change and shift due to the advent of e-books. Therefore, in spite of many advantages and disadvantages of e-books, it seems that e-books and print books are able to complement each other's strengths and weaknesses quite well.

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Success Story of TKDL to Safeguard TK: A Long Journey from 1990's to 2013 as a Model in Changing Information World

Jayshri Mondal



TKDL (Traditional Knowledge Digital Library) as collaborative project of CSIR is enormously achieving the goal to protect the indigenous knowledge of India from being patented by intruders. By just knowing the age old formulas of curing diseases and many other useful knowledge, which is known even by the layman and child of our country, also known as "dadi ma ke nuskhe" these poachers patented these as their own inventions. This paper analyses print media coverage of many national and international level releases, which cope up with this issue. This paper describes that how TKDL successfully proof its efficiency in tackle with the issue of misappropriation of TK. This paper reveals many interesting facts of TKDL's success story.



TKDL, Indigenous knowledge, Traditional knowledge, Activities of TKDL, Safeguarding of indigenous knowledge, TKDL as a model.

1. Introduction

In modern age every thing that you claim of your own you have to proof it, if anybody claims that TK is present already in knowledge domain than they have to show its existence previously than how the Traditional Knowledge exist mainly in oral form or in ancient text will be protected from being misappropriated, the answer is TKDL with some extended capabilities. In western world to claim any fact/knowledge as not to be patented one, it should be published in research journal or in any database and TK of many TK rich countries are present mainly in ancient text in their language so it is not known patent examiners and buried deep in darkness of unknown and some organization/individual make profit out of it.

2. Review of literature

According to all previous studies & most famous cases or reports including many news paper article including government publication explains that TKDL expands its horizon to combat the issue of misappropriation of TK. TK is exploited by many MNC's pharmaceutical companies, by individuals, sometime also by their own people, first of such eye-opening event recorded in 1995 when two expatriate Indians at university of Mississippi medical center (sumac k. das & harihar cohly) were granted US patent (no.5,401,504) on use of turmeric in wound healing and in 1994,European patent office(EPO) granted a patent(EPO patent No.436257) to US corporation WR Grace company and US department of agriculture for method for controlling fungi on plants by aid of hydrophobic extracted neem oil they called it neemix. Basmati rice is tried to be patented by Rice tech Inc. for it they gave it name 'texmati'. Many such cases are evident world wide In newspaper analysis most popular among such cases are pistachio as anticancer by Italian, watermelon as antivitiligo by Spain, Bengali gram by Chinese, brahmi, tea, ashwagandha and turmeric as ant ageing by American, Indian lotus for heart treatment by Korean etc. In the field of Yoga it expands its steps and TKDL task force on Yoga is formed when the cases of misappropriation as "bikram yoga" revealed. Bikram yoga is a brand name started by Bikram choudhury of Kolkata in US. India's TK on yoga is misappropriated by their own natives. Bikram obtain his first US copyright in 1979 for book he wrote "bikram's beginning yoga class", he also got the brand name of his company "bikram's yoga college of India" also another case come out as "baby yoga" by a south Korean person who tried it to be patented. In India every grand mother or midwife knows this movement to keep baby healthy. According to a report of science reporter named "safeguarding traditional knowledge" TKDL operates within the established rules and laws of recognized patent system and does so in a manner that cannot be challenged in anyway."

3. Methodology

For the study researcher adopt the method of observation and analyses the different functionalities, achievement of TKDL for protecting the traditional knowledge from being exploited by individuals and mainly from big pharmaceutical companies. For analysis web resources are observed including official website of TKDL and 270 online publications of reputed news agencies of both the national and international level like- Hindustan times, Times of India, DNA, Navbharat, Nature, BBC The wall street journal etc. and publication of Indian govt. departments which tackle with this issue. For this study strategy adopted is going through all the news paper one by one out of which 76 news papers are published before2009, 40 published in 2009 , 65 published in 2010, 41 published in 2011 and 18 published in 2012, 1 in 2013 and 28 of them are published in news papers of international repute.

4. Origin and timeline

The cases of such big misappropriation of TK create panic among the developing world which has a rich traditional knowledge domain. In India recognition of TKDL has been realized in June 1999 by WIPO's standing committee on IT so department of ISM&H(Indian System of Medicine and Homeopathy) has been directed toward taking initiative, approach paper on setting up of TKDL prepared on Oct. 1999 and submitted it to SCIT,WIPO on Dec 1999. An Interdisciplinary task force on TKDL, consisting of experts from department of ISM&H, CCRAS, BHU, NIC, and CGPDTM has been created on Jan 2000. This task force had submitted its report on May 2000 also in this month TKDL concept and vision is presented at international forum CCEA approve it on Jan 2001.MOU is signed between ISM&H and NISCOM. TKDL software specified and designed on July 2001. A TKDL team of project assistant experts and patent examiners established on Oct. 2001 to mar 2002. TKRC a new innovative classification system is presented before IPC union for getting established WIPO-TK Task Force consisting of USPTO, EPO, JPO, China, and India. On Feb 2001, committee of experts had recommended the inclusion of 200 subgroups on medicinal plants and linking TKRC to IPC and continuation of work on biodiversity, TK and ICE.Internationally specifications are setting up for TK databases based on TKDL specifications on Nov 2002. On Aug 2002 constitution of access policy issue committee had been made to frame policies on accessing TKDL databases, decide on matters related to dissemination of TKDL and to meet defensive and positive objectives of TKDL. Till that time TKDL abstracted the knowledge of Ayurveda but TKDL Unani project started on June 2004 and in Aug 2004 TKDL Ayurveda phase II had started TKDL↔EPO access consider in meeting of Aug 2004. IPC↔TKRC approved linking on Oct. 2004. TKDL↔EPO access requested on Jul. 2005. TKDL siddha project started on Aug 2005till Dec 2005 TKRC contains 25000 subgroups. There are many conversations continues for providing access to TKDL database to IPO's CCEA approved such access agreement between TKDL↔IPO's on June 2006. Access agreement sent to EPO on July 2006, Dec 2006, Request by USPTO received and sent them Access agreement on Dec 2006. Activities had started to create TKDL Yoga on Jan 2008, finally EPO↔TKDL access agreement concluded on Feb 2009. Request for access to TKDL by German patent and trademark office (DPMA) on Mar 2009. Request from Malaysia and Thailand for experience sharing found respectively on Mar 2009 and Apr 2009. USPTO in principle agreement to TKDL database conveyed on may 2009. Formal agreement to TKDL access agreement by USPTO had sent on Jul. 2009. Access to TKDL database granted to CGPDTM (Indian Patent Office) on Jul 2009.TKDL access agreement concluded with German patent & Trademark office (DPMA) on Oct. 2009. TKDL access agreement concluded with USPTO on Nov 2009. TKDL access agreement concluded with JPO on Apr 2011.

5. Success story of TKDL

TKDL stand in front of world as an ideal model for safeguarding TK against bio piracy. TKDL successfully cope up with this issue. According to status report of Status Report of Aug 2013 consist of 34 million pages and have transcribed 97,010 formulations of Ayurveda, 1,68,113 of unani, 22,585 of siddha and 1,654 postures(asana) of yoga, also move ahead continuously .TKDL have achieve the milestone of 2.89 lakh formulations in total.

In 1995 the US patent office granted a patent on wound healing properties of turmeric Indian scientist protested and fought a legal battle to get patent revoked on 1997.India wins 10 year battle at EPO against patent granted on antifungal product derived from neem. In 1998 USPTO granted a patent on basmati rice that has been grown here for centuries in Himalayan foothills revoked in 2000,an expatriate Indian yoga teacher has claimed copyright on sequence of 36 yoga postures, to fight such legal battles huge amount of time and money have to invest. According to V.K. Gupta chief designer of TKDL "It is easy to create TKDL instead of searching biopirates here and there." National biodiversity authority was set up in 2003 at Chennai. Director General of WIPO Francis Gurry said that" There should be world wide treaty and binding regulation or merely guidelines." According to IGC (Inter Governmental Committee on Intellectual Property and genetic resources, Traditional Knowledge and Folklore 184 members from different states) it works as a practical initiative and faster than legal framework and it is a technical platform which can work alongside legislative framework. TKDL saves a lot of money of our country, if we count the total cost for cancellation of patents for all these it approximately costs 2,92,662*3 crore INR. It works at zero cost but profit can be gained out of it. Following table shows major achievement against bio piracy.

Table 1: International Patent Office wise TKDL's Outcomes against Bio-Piracy

	Outcomes realized Through Cancellation	Outcomes realized through Withdrawal	Outcomes realized through Amendment	Total cases of Misappropriation of TK
EPO	4	72	29	141
USPTO	9	-	7	16
IP Australia	-	1	3	4
CIPO	29	-	-	29
UKPTO	3	-	-	3
GPO	-	-	-	-
JPO	-	-	-	-
CGPDTM	3	2	-	5

Table 2 country wise outcomes against bio piracy

Country	Number of cases filled
India	13
Japan	19
Italy	13
Korea	7
Denmark	4
China	4
Germany	10
US	39
UK	8
Switzerland	4
Australia	4
Canada	4
Spain	3
Netherlands	2
Israel	3
France	2
Cyprus	2
Canada	4
new Zealand	2
Russia	2
other	14

Table 3: Year wise cases filed which are either in consideration or rejected

Year	Total cases filled deemed to be pirated
2000	6
2001	1
2002	4
2003	11
2004	5
2005	19
2006	20
2007	29
2008	31
2009	22
2010	11
2011	1
2012	1

6. Architects or designers of TKDL

V.K.Gupta is considered as chief designer of TKDL he is responsible for preparing approach paper on setting up of TKDL, TKDL software, specifications and design and on behalf of India was attended meeting WIPO-TK Task Force recommended for adding a subclass under A 61.Other persons played important role is Dr. R. A. Mashelkar who is responsible for recognition of need of creation of Traditional Knowledge (TK) data bases and need of support to developing countries by Standing Committee on Information Technology (SCIT) of World Intellectual Property Organization (WIPO) and submission of approach paper to SCIT, WIPO. Institutions such as CSIR, Department of AYUSH and Morarji Desai national Institute of Yoga (MDNIY) also played important role in functionalities of TKDL. Some NGO also play important role to combat similar problem and above all the HR of TKDL plays most important role.

7. Legislative Provisions in this direction

In Indian patent Act section 3 there is provision that TK should not be patented. India also passed biological biodiversity Act. Sometime TK cannot be identified because of some faulty believe system to cope up with issue Indian govt. implemented "Drug and magic remedy Act 1954". TRIPS Article 29 seeks to include concerns of India and other developing countries with regard to their biological resources particularly their use in pharmaceutical industry. WTO to some extent allowing countries to break patent on drug when need to manufacture them in the case of national medical emergence. Nagoya summit also prepared 31 Article summit(NSBD), although CBD(convention on biological diversity) have provision for protecting TK but bio pirates found the ways to exploit but the NSBD can cope up with this issue well.

- **Key or major events:** International Conference on 'Utilization of the Traditional Knowledge Digital Library (TKDL) as a Model for the Protection of Traditional Knowledge' .tenth Conference of Parties (CoP) to the Convention on Biological Diversity (CBD) to be held in Nagoya, one of the major items for consideration is the adoption of an international protocol on access and benefit sharing (ABS). India and other developing countries are pushing for an international legal framework for use of biological resources. The agreement will deal with the issue of bio piracy. 11th Conference of Parties to the

Convention on Biological Diversity (CBD) held in 2012 in New Delhi which not only shows India's role as a major mega-diverse country, but also its commitment to playing a leadership role in biodiversity conservation. "The event will mark the 20th anniversary of the Rio Earth Summit held in 1992 and will be called the "Rio+20" CBD Conference." Also for oral knowledge separate program is conducted by ICMR, National innovation foundation.

- **Economic aspect of TKDL:** India has launched a New Millennium Indian Technology Leadership Initiative (NMITLI) program on Ayurveda based on herbal drug development in 2002. As a study of Assocham estimated that herbal market is likely to be reached Rs. 14,000 crore and exports to 9000 crore by 2012. India's share in global trade is 2.5% against 13% of China. India has a rich biodiversity and 7000-8000 known to have medicinal properties. In another study approximately 1.65 crore Americans are spend approx. 3 billion $ per year on Yoga and related cosmetics. With the help of TKDL safeguarding TK is proved as an encouraging factor for local pharmaceutical companies. According to Samir K. Brahmachari of CSIR India is just going to start such project costs approximately 2000 crore INR.
- **Social benefit for medicinal advances:** TKDL can also be serve as a knowledge repository for local pharmaceutical companies to invent new cheaper drug from this knowledge for benefit of mankind so that the people from lower financial background may take benefit from it and also some part of it are available for all the peoples. Actually it can be used as balance between health as a benefit and health as a right. It has immense potential for creating new Intellectual Property through collaborative research and providing affordable medicines for all, in particular for developing countries. In this case TKDL works as an "open source drug discovery model" because still now 70% of total population depends on TK based drug in general. According to a study of TKDL Task Force 80% of American patents based on plants are related with Indian plants. According to another study 20-30% of allopathy formulas are derived from Ayurveda, so why we don't get benefit for it for social welfare by non enclosure agreement with local pharmaceutical company. It should act as open innovative model.
- **TKDL IPR vs. Non IPR:** Sometime TKDL considered as Non IPR system but actually it is not one out of both it is only a prior art should not to be considered as Non IPR. Firstly MHRD in 2006 had written to PM that access to the IPO's not to be granted because it would be violation of CBD, The CSIR and ministry of commerce department of industrial policy believed that knowledge in TKDL is all public domain CBD doesn't apply to it.
- **Internal working mechanism of TKDL:**-Traditional Knowledge Digital Library works in very well organized manner at very grass root level it analyses the codified traditional medicinal knowledge which generally available in the languages like Sanskrit, Urdu, Arabic, Persian, Tamil and many indigenous languages. These literatures are existing in darkness of unknown just because of language barrier which digital library reveal in front of world's IPR system. With the contribution of 150 experts of different discipline and an interdisciplinary team of 25 Ayurveda experts, 1 patent examiner, 5 IT experts 3 NISCAIR scientists and 4 Technical officers Indian codified knowledge is translated in 5 international languages which are English, German, French, Spanish and Japanese. After this translation process it appears in TKDL in following format:-
    - Name of Drug
    - Origin of knowledge
    - Constituents of the drug with their parts used and their quantity
    - Method of preparation of drug and usage of the drugs
    - Bibliographic details

TKDL also develops the TKRC for classification, it is based on IPC. TKDL also develops software which makes translation of TK (Traditional Knowledge) somewhat easy; it changes the traditional terms into modern scientific words. It also gives scientific names to the plants. For oral traditional knowledge which are still

conceal now came into consideration by people's biodiversity register (PBR) under national biodiversity act 2002

- **External working Mechanism of TKDL:**-External working mechanism of TKDL is largely concern of collaboration and unified mechanism where international patent offices are in agreement to tackle with this issue. TKDL access agreement have been signed with 8 international patent offices EPO Feb 2009, USPTO Nov 2009, CGPDTM July 2009, CIPO Sep 2010, GPO Oct 2009, UKPTO Feb 2010, with IP Australia Jan 2011 & JPO Apr 2011, so that patent examiners are able to evaluate the patent claims to achieve the goal to protect the traditional knowledge from being exploited and invention to be noble and innovative not a simple modification of previously existing knowledge

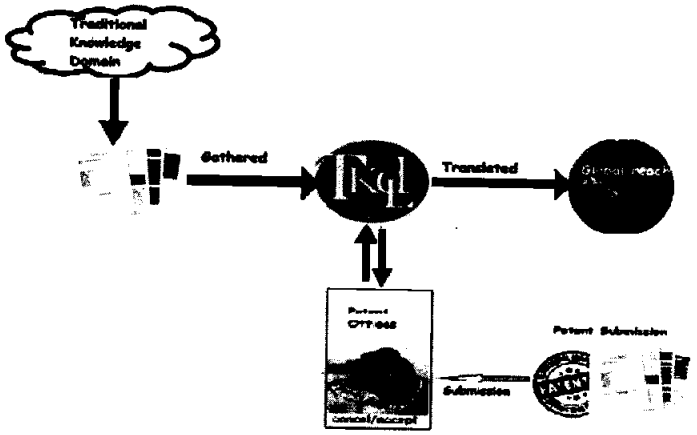


Fig. working mechanism of TKDL

8. **Findings** :we have these finding throughout the study:-

- TKDL has successfully fullfill its purpose.
- There is decline in the cases of misappropriation after emergence of TKDL.
- TKDL plays a leadreship role and also stood as a model to fight against biopiracy.
- TKDL also saves a lot of money and time of our country which spent on legal battle.
- TKDL also safeguard nations integrity by safeguarding its TK.
- TKDL as prior art is much more fast than legal framework and also supportive to the legal IPR system.
- TKDL can also be used for commercialization and for social welfare.
- TKDL can also expand its capabilities for much better functionalities.
- It also combat with the language barrier serve as bridge between TK and patent examiners worldwide.

9. TKDL as world leader in the field of safeguarding TK

India's TKDL creates a new wave of movement against misappropriation of TK. TKDL stood in front of world as a model. When TKDL take initiative situation is that biopiracy gains its potential world wide it got its worst form but TKDL tackle with this issue in well manner.Many other countries also eager to implement the starategy of TKDL , request also found by Malaysia and tThailand for organising workshop. Some other countries adopt this model are : Republic of South Korea, Afganistan, Indonesia, South Africa, Mongolia,

Cambodia, China, Brazil, Mali, Srilanka, Pakistan, Nigeria, African Regional Industrial Property Office, SAARC member states, etc. TKDL initiative has also been fully recognized by international organizations such as WIPO, WHO, WTO, UNESCO, etc. for documentation of traditional medicine systems and Intangible Cultural Heritage. International and national media have done extensive coverage on TKDL and the project has been covered by reputed international magazines such as *Time, Nature, Washington Post, Wall Street Journal, BBC* and several other electronic channels and the print media.

10. TKDL vs IPO's

TKDL have nondisclosure access agreement with 8 international patent offices so patent examiner can evaluate the patent claims for its originality and problem of biopiracy can be checked. According to Gurry Director General of WIPO 2006". There should be worldwide treaty to copeup with the issue of misappropriation. TKDL also trained the HR of diferent IPO's in tactics of searching the TKDL Database following table shows the chronology of IPO↔TKDL Acess Agreement.

Name of Patent office	Date on which concluded
EPO	FEB 2009
CGPDTM	JULY 2009
GPO	OCT 2009
USPTO	NOV 2009
UKPTO	FEB 2010
CIPO	SEP 2010
IP AUS	JAN 2011
JPO	APR 2011

10. Conclusion

After considering the whole status quo we can sum up that TKDL as a digital library Initiative proof its efficiency in protecting the Traditional Knowledge from bio piracy although it is confined to patent offices with non disclosure agreement but some of its part is accessible to general public for welfare purpose. In western world for protecting knowledge it is necessary that it should be published or present in database so TKDL revealed as prior art model which represent age old traditional knowledge present in ancient writ ups of India, which are unknown to other part of world just because of language barrier. TKDL also proof its boosting power for economic gain. Further research area can be how TK which belongs to specific communities can be managed through KM and how TKDL extend its capacity for knowledge of fields other than medicinal use.

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Author



Jayshri Mondal

The Future Role of the Academic Liaison Librarian: *A Literture Review*

Sachin J. Shastri



The futhre of the liaison librarian in the university is an issue that currently occupies many minds. It is naturally of prime concern to the liaison librarians themselves, but it is also a significant issue for library managers. Many university libraries are adopting a Faculty Liaison Librarian sturcture as an integral part of threir organisation and service delivery model. This paper deals with the review of literature available, the author has searched various online datbases with full text articles like (Emerald, Science Direct, Ebsco, Etc). following a review of literature and other sources on the rationale and role of library liaison, the current developments and expectations are discussed.



Academic liaison, Literature review, Role of librarians

1. Introduction

The futhre of the liaison librarian in the university is an issue that currently occupies many minds. It is naturally of prime concern to the liaison librarians themselves, but it is also a significant issue for library managers. Many university libraries are adopting a Faculty Liaison Librarian sturcture as an integral part of threir organisation and service delivery model. There is a interesting range of opinions on the subjects, all claiming to plot emerging trends by extrapolating from current observations, and all pleasantly unhindered by empirical data, only study, at least, is candid enough to admit that "the future is difficult to predict" (Mullins, Allen, & Hufford, 2007)

Demand for information is on the increase across the globe but the demand for better access to information is more marked in higher educational institutions as subjects taught and research becomes more specialized and interdisciplinary. It is also a fact that range of information sought by researchers are growing continuously and academic libraries are faced with the problem of supplying timely and adequate information held by libraries not only in printed form but also in electronic form including on-line data. How do academic librarians cope up with the growing demand? Academic librarians have grown more accustomed to the rapid pace of change in their libraries.

As far as the field of library liaison is concerned, the literature on the subject is constantly growing; the literature reviewed for the study is not intended to cover all the investigation done in this field. Rather, it focuses on the portion of world literature on library liaison in general and its application in academic libraries in particular. However, the researcher has made an attempt to review articles published in journals, survey reports and chapters taken from books relevant to the study, beginning from the years 2000 to 2013.

2. Objectives

- To know the future role of the Academic Liaison Librarian
- To find out the available literature published
- To adjudicate the practices of he academic liaison librarian, which will be operated in he 21st Centuary Librarianship.

3. Research Methodology

This paper deals with the review of literature available, the author has searched various online dat' ses with full text articles like (Emerald, Science Direct, Ebsco, Etc). following a review of literature and other sources on the rationale and role of library liaison, the current developments and expectations are

discussed. The related literature published in various databases during the 2000 and 2013 are reviewed in this paper.

2. Literature Review

- **Evolution:** The Faculty liaison librarian role is not entirely new, evolving from the traditional subject librarian and university special/branch library role, but is now recognized as a major and even essential activity. Almost 30 years ago a short, seminal article by Laurence Miller set out the challenges even then facing academic libraries as the primary information providers and suggested that this necessitated the marketing of library services and closer integration of these with academic programs (Miller, 1977). The author defined liaison work as "a formal, structured activity in which professional library staff systematically meet with teaching faculty to discuss stratagems for directly supporting their instructional needs and those of their students." This formal activity was distinguished from the occasional contacts which are common between libraries and faculty (Miller, 1977, p. 213). Already by the late 1980's a quite broad and mature view of liaison work is evident, with the idea of a partnership with faculty and a proactive library stand informing a liaison program. "Assigning librarians to work with specific departments in a systematic and structured way creates a channel of communication that allows the faculty's needs to be understood by the library and the library to be interpreted to the faculty", and a very wide range of activities is included in a liaison program: "Services performed by a liaison or subject specialist typically include establishing contact will user groups; communicating information about library policies and programs; eliciting information about curricula changes; selecting materials and collection development; instructing in library use; providing current awareness, reference, and bibliographic services; serving as a library ombudsman for users; and bringing user perspectives to the technical services departments." (Sehlomon, 1989, p. 496)

  Despite this broad conception of liaison work, in the subsequent literature two dominant strands of liaison are evident. The first relates liaison work closely to collection development. So, for example, in the *Guidelines for Liaison Work* issued by the Reference and Adult Services Division of the American Library Association in 1992, liaison work is defined as "the relationship, formal and informal, that librarians (in this instance, librarians with multiple responsibilities) develop with the library's clientele for the specific purpose of seeking input regarding the selection of materials." The importance still given to collection development is evident in a recent description of the liaison program at the University of Hong Kong, though other significant duties are identified: "collection building; research consultation; instruction on subject- specific library resources; integrating library materials into teaching and learning resources; promoting library services; and fostering closer collection with faculty." (Chan, 2005)

- **Liaison Relationship: Students, Faculties and Librarians:** Rubina Bhatti (2009) attested that interpersonal relationship plays an important role in establishing liaison activities among students, teachers and librarians as the study made an assessment of the interpersonal relationship among student-teachers-librarians in the university libraries of Pakistan. The study covered ten university libraries of Pakistan. The information could be useful for the librarians and information specialist for developing positive working relationship. Librarians could play their role effectively in educating the users to wealth of information contained in Pakistani university libraries. The study also points out that the interpersonal relationship plays a major part in developing attitudes towards library services and user education and particularly liaison aspects. Thull, James and Mary Anne Hansen (2009) conducted a survey in Montana State University Libraries-Bozeman to determine the awareness and effectiveness of the established liaison programme. The survey had an additional intent to identify areas in need of improvement as well as any new services decided by the patron of libraries. The survey was conducted via campus e-mail service. This study offered a creative and successful liaison that needs to continually explore alternative means for providing outreach programs and serving the needs of the clienteles.

Anne Millard-Daugherty (2001) designed a learning Community through Faculty/Student/Librarian collaboration at Washburn and Kansas Universities. A pilot project was implemented during the Fall of 2001. The goals of the project are respectively improving students' information literacy skills, promoting the librarian as a valuable resource, enabling the librarians to learn about the needs and research habits of today's students and creating mutually beneficial faculty/librarian/student partnerships. This report presented findings, learning experiences, and suggestions for future projects. Tammy Sugarman and Constance Demetracopoulos(2001) conducted a study relating to creating a web research guide to have a collaboration between liaisons, faculty and students by the efforts of two liaison librarians at William Russell Pullen Library, Georgia State University(GSU), to build a long-term, sustainable partnership among teaching faculty, graduate students, and librarians in the development and maintenance of a Web-based research guide for world history. The authors saw the success of this venture as a way to collaborate with more faculty and increase the level of student participation on an ongoing basis. Working with the teaching faculty and students has given the liaison librarians a renewed stake in the education mission of GSU community. The project has also enhanced the visibility of the librarians among the teaching faculty and students, resulting in a better understanding of the importance of the library professional to the educational process. The outcome of this study has enabled the librarians to create a web research guide in various aspects of this discipline.

Ekkebus, A. E. (2001) examined that liaison program and changes that have resulted include an increase in levels of library activity especially literature searching (a 60% increase in three years), a willingness by researchers to make their information needs known, and the development of a responsive collection. Surveys of recipients of the literature searches have indicated high satisfaction of the search results. The liaison program encourages communication between the reference librarian and researcher and enabled the library better to attain its objective of interpreting and meeting the information needs of its users.

- **Other Roles:** There are range of other tasks that are seen as being important for the liaison librarian of the future. A UK study reported that, there are a number of additional roles that librarians are interested in developing; pJroviding specialist advice in copyright and Intellectual Property Rights issues, managing non-technical metadata issues, acting as technology specialists in facilitating access to electronic resources, and most importantly- managing institutional repositories of digital information. With respect to copyright advice, some libraries already employ specialist lawyers, others told us that had taken the role into the library from other places (Research Information Network & Consortium of Research Libraries, 2007)

  A recent american report on the top ten assumptions for the future of academic librareis stated that "there will be an increased emphasis on digitizing collections, preserving digital archives, and improving methods of data storage and retrieval. Libraries should collaborate with disciplinary colleagues in the curation of data as part of the research process" (Mullins et al., 2007).

The same report predicated that "distance learning will be an increasingly more common option in higher education" (Mullins et al.,2007), and a recent UK study found that many librarians saw the facilitation of e-learning as a core role for the future, although acadeics did not appear to share that opinion (Research Information Network & Consortium of Research Libraries, 2007)

- **Sustainability:** As has been described, dynamic external and internal environments of universities are driving the evolution of library liaison, so the role description is still fluid. Liaison, in its diverse forms, is recognizes as crucial. However the breadth and weight of expectations is now such that the effectiveness and sustainability of the role has to be addressed. A dramatic increase in the take-up of library services is manageable when traditional and in particular automated services are involved. However given the personal nature of liaison work and its demands on the individual librarian, expansion and intensification of the work raises questions about its sustainability. Is it currently

sustainable because demand is relatively low and therefore manageable? Is this so because most take-up of services is based on the individual academic's knowledge of what the library can offer and their desire to make use of it? Already the pressure on library staff produced, for example, by the success in instigating information literacy programs can be substantial.

Another aspect of sustainability and effectiveness is the availability and development of new skills and attributes necessary to the intensified liaison role. Many liaison librarians bring to their jobs a strong functional knowledge through their qualifications and experience. This may be enhanced with their subject knowledge, but if there is to be true engagement with academic staff then how successful this will be may rely on much wider skill and attribute sets for librarians (Dale, 2006, p. 22). The types of skills and attributes which are relevant to the enhanced liaison role would include the following:

- Confidence
- Communication and presentation skills of a high order
- Risk taking
- Flexibility and comfort with ambiguity
- Networking skills, being able to build coalitions and cultivation of clients and supporters
- Relationship or "account management" skills
- Reflection on practice and ability to learn/play
- Promotion and marketing skills
- High level technical knowledge – not only for any production/publishing work but to be able to facilitate or mediate between parties to achieve outcomes
- While aspects of these have been required in the past, the relation of these to traditional library skills requires consideration in selecting staff for liaison work as well as for planning staff development for those already engaged in or ambitious for liaison work.

4. Conclusion

While a dynamic, broader and more intensive role for the Faculty Liaison Librarian is emerging, more thinking is needed about the extent of that role and its sustainability. What, for example, are the priorities for the Faculty Liaison Librarian? What traditional activities can and may have to be abandoned? These considerations are necessary not only to guide the librarians but to help define the attributes and skills required for the position and to determine the institutional support it requires.

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Use of E-Journals by the Research Scholars of Kakatiya University Library: *A Study*

Sujatha, S

Abstract

The study describes the use of e-journals by the research scholars of Kakatiya University. A well structured questionnaire was designed to elicit the opinions of the research scholars. The responses were gathered from 75 research scholars. The results of the study provide information about the purpose, frequency, and time spent for access the e-journals and place of accessibility, satisfaction and problems encountered while accessing the e-journals. On the basis of the finding, some suggestions have been put forth for maximizing the use of e-journals and some of the valuable suggestions given by research scholars are highlighted.

E-journals, Research scholars, Kakatiya University, Warangal

1. Introduction

The use of Internet by students and research scholars is an important area of study in today's information environment. It also enables scholars and academic intuitions to disseminate information to a wider audience around the globe through having websites and a way to search them and organize the output. E-journals have emerged as a powerful medium of scholarly communication. These are now more popular with libraries and readers than their print counter parts, although both forms continue to exist for a majority of titles (Tenopir and King, 2002). E-journals are a very important source for the research and development. The e-journals has become an important component in academic institutions and it plays a pivotal role in articles, papers etc. from anywhere in the world. The quantity of e-journals is growing larger and has become a quite visible entity in serial publication. Today most of the e-journals appear as parallel version of its print counterparts and more and more publishers are making their journals available in electronic format.

2. Review of literature

Review of related literature is very essential in a new research topic because each research study has its own specific purpose. Study of related literatures implies locating, reacting and evaluating reports of research as well as report of casual observation and opinion are related to the individual planned research project. Investigator reviewed only those studies which were similar to the present study or indirectly related to the present study.

The article "Usage of E-journals by researchers in Aligarh Muslim University: A study" presents a study that seeks to examine the usage of e-journals by the researchers at Aligarh Muslim University. The survey reveals that all the researchers are aware of e-journals in AMU. From this survey, the investigator has been able to find out that many research scholars are consulting e-journals from their departmental labs and computer centres, not only for research purposes but also to update their own knowledge. However, the study also revealed several problems, including lack of training and slow downloading. The researchers' feelings about the need for print journals as well as electronic journals are also discussed. (Raza & Ashok 2006).

Using "Science Direct" that was provided by Elsevier Science at the Japan Atomic Energy Agency (JAEA) carried out "a survey on the usage of electronic journals" Results showed that the number of users and articles read by users increased during the survey period. Moreover, JAEA users browsed a total of 1,028 titles for various fields such as chemistry, engineering, medicine, physics, and social sciences. (Fuzaka, et al 2008). The research paper studied the effect of E-journals on the faculty members. The survey method was used for this study. A random sample of 500 academic staff of Obafemi Awolowo University, Ile-Ife, Nigeria

was selected, among them total of 245 (49 percent) completed questionnaires were retrieved and the majority (150) of respondents prefer electronic journals, while ninety-five (39 percent) prefer print. The results of the present study recommended that university library should increase bandwidth and online journal subscriptions, seeking more funds to do so. More bandwidth will also improve access time as the systems will work faster. Subscriptions to print journals should be maintained. (Omotayo 2010). The article carried out a study on the use of electronic resources by teachers, students and research scholars of universities and research organizations. The survey titled "Use of UGC Info net E-Journal by Research Scholars and Students of University of Delhi" revealed that the seventy-eight percent (78%) of the respondents feel that the use of the UGC-Info net e-journals has created high dependency value on their research work and they needed current article alert services and electronic document supply services (Madhusudhan 2008).

3. Objectives

The study was carried out to achieve following objectives:

- To find out the purpose of using e-journal services by the research scholars
- To find out the frequency and time spent for accessing of e-journals
- To know the most preferred places to access e-journals
- To find out the most preferred method of reading format of e-journals
- To find out the most preferred search engines used by the scholars.
- To encountered the problems faced by the scholars while accessing e-journals
- To study the satisfaction level on e-journals provided by the University Library

4. Methodology

A well structured questionnaire was designed for eliciting the attitude of research scholars towards use of e-journals. Personal interviews were also conducted to fill in the gaps if any. A total of 102 (100%) questionnaires were administered to research scholars, out of which 75 (74%) filled questionnaires were collected from the research scholars for analysis of data. The collected data classified and tabulated and presented with the help of percentages.

5. Data Analysis & Interpretations

Table 1 - Gender-wise respondents

Gender	Response Received	Percentage
Male	54	72.0%
Female	21	28.0%
Total	75	100

It is evident from table 1 that 72% percent are male respondents and 28% percent are the female respondents. It is clear that majority of the male respondents are responded in this regard.

Table 2 - Age groups of respondents

Age group (years)	Response Received	Percentage
Below 25	5	6.6%
26-30	36	48.0%
31-35	24	32.0%
Above 36	10	13.3%
Total	75	100

The above table 2 depicts that the age groups of the respondents. Most of the of the respondents (48.0%) are between the 26-30 years, followed by (32.0%) are in between 31-35 age group, 13.3% respondents are above 36 years, and 6.6% respondents are in below 25 age group. It is clear that between 26-30 years respondents are responded in this regard.

Table 3 - Purpose of using e-journals

Purpose	Response Received	Percentage	Preference
For Research work	71	94.6%	i
For writing papers/articles	39	52.0%	iv
For update subject knowledge	52	69.3%	ii
For studying course work	43	57.3%	iii

Note: Respondents could choose more than one

From the above table 3 it is clear that a large majority of the respondents (94.6%) purpose of using e-journals for their research work, 69.3% respondents use e-journals for update subject knowledge, 57.3% for studying course work, and 52.0% using e-journals for writing papers/articles.

Table 4 - Frequency of using e-journals

Frequency	Response Received	Percentage
Daily	38	50.6%
Twice in a week	21	28.0%
Once in a week	6	8.0%
Occasionally	10	13.3%
Total	75	100

It can be observed from the table 4 that, the majority of the respondents (50.6%) using e-journals daily, followed by twice in a week (28.0%), occasionally (13.3%) and once in a week (8.0%). It can be concluded that majority of the respondents using the e-journals daily.

Table 5 - Time spent for the using e-journals (per day)

Time spent	Response Received	Percentage
Up to 1 hr	11	14.6%
1-2 hrs	32	42.6%
3-5 hrs	26	34.6%
Above 5 hrs	6	8.0%
Total	100	100

The response shows from table 5 that majority of the respondents (42.6%) replied that they are spending time to access the e-journals 1-2 hours. It is also clear from that (34.6%) access 3-5 hours, 14.6% access the e-journals up to 1 hour and the remaining 8.0% are using above 5 hours per day.

Table 6 - Most preferred access point of the e-journals

Access point	Response Received	Percentage	Preference
Central Library	67	89.3%	ii
Department Library	72	96.0%	i
Other Places	16	21.3%	iii

Note: Respondents could choose more than one

It has been found from table 6 that majority of the respondents (96.0%) get access to the e-journals at department library, 89.3% at central library, and 21.3% are accessing e-journals at other places. It is found that the majority of respondents accessing point of the e-journals are departmental library.

Table 7 - Most preferred search engine used to access e-journals

Search Engine	Response Received	Percentage
Google	68	90.6%
Yahoo	6	8.0%
Others	1	1.3%
Total	75	100

Table 7 reveals that, the large majority of the respondents (90.6%) are preferred Google search engine for accessing e-journals, followed by Yahoo (8.0%) and others are 1.3%. It is obvious that Google search engine is very fast in searching the information compared to other search engines, so that the respondents are very much desired about the Google.

Table 8 - Most preferred formats of e-journals

Format	Response Received	Percentage	Preference
PDF	32	42.6%	iii
HTML	46	61.3%	ii
Both (PDF & HTML)	59	78.6%	i

Note: Respondents could choose more than one

It is evident from table 8 that, the majority of the respondents (78.6%) are preferred both (PDF & HTML) formats for accessing e-journals, followed by HTML 61.3% and PDF 42.6%. It is clear from the table that the KU library respondents are preferred both formats for accessing the e-journals.

Table 9 - Preferred methods of reading full text e-journals

Method	Response Received	Percentage	Preference
Printout on the paper	8	10.6%	iv
Display on the computer monitor	44	58.6%	iii
Downloading in the CD/DVD/Pen drive, etc.	52	69.3%	ii
Attached to the e-mail	56	74.6%	i

Note: Respondents could choose more than one

From the above Table 9 it is clear that most of the respondents (74.6%) preferred full text e-journals attached to the e-mail, followed by 69.3%, downloading in the CD/DVD/Pen drive, etc., 58.6%, display on the computer monitor and 10.6% preferred to take printout on the paper. It is obvious that most of the respondents are attaching the e-journals to their e-mail because; whenever necessary they can retrieve in to their e-mail.

Table 10 - Problems encountered by accessing e-journals

Problems	Response Received	Percentage	Preference
Lack of budget	41	54.6%	iii
Coverage of e-journals is insufficient for research	56	74.6%	i
No assistance provided by the library/information professionals	34	45.3%	iv
Lack of training	25	33.3%	v
Time consuming	47	62.6%	ii

Note: Respondents could choose more than one

The table 10 reveals that out of 75 respondents, 74.6% respondents mentioned that coverage of e-journals is insufficient for research is the main difficulty with regard to utilization of the e-journals, 62.6 % of the respondents were replied time consuming, 54.6% replied lack of budget, 45.3% respondents said that no

assistance provided by the library/information professionals and 33.3% are answered that lack of training. It is found that, most of the respondents are not using the e-journals properly because of coverage of e-journals is insufficient for research.

Table 11 - Level of satisfaction for using e-journals

Satisfaction	Response Received	Percentage
Highly satisfied	15	20.0%
Satisfied	48	64.0%
No comment	12	16.0%
Total	75	100

The above table 11 furnishes the user satisfaction on e-journals. It can also observed that, out of 75 respondents, 64.0% of the respondents are satisfied with the e-journals, and 20.0% of the respondents are highly satisfied, and 16.0% are said no comment. It is obvious that majority of the respondents are satisfied with e-journals provided by the Kakaitya University library.

6. Major Findings

- Most of the of the respondents (48.0%) are between the 26-30 years, followed by (32.0%) are in between 31-35 age group respondents are responded in this regard.
- A large majority of the respondents (94.6%) using e-journals for their research purpose and 69.3% respondents use e-journals for update subject knowledge,
- The majority of the respondents (50.6%) using e-journals daily, followed by twice in a week (28.0%).
- Majority of the respondents (42.6%) replied that they are spending time to access the e-journals 1-2 hours and (34.6%) access e-journals 3-5 hours per day.
- Majority of the respondents (96.0%) get access to the e-journals at department library, 89.3% at central library.
- A large majority of the respondents (90.6%) are preferred Google search engine for accessing e-journals, followed by Yahoo (8.0%).
- Majority of the respondents (78.6%) are preferred both (PDF & HTML) formats for accessing e-journals, followed by HTML 61.3%.
- Most of the respondents (74.6%) preferred full text e-journals attached to the e-mail, followed by 69.3% downloading in the CD/DVD/Pen drive, etc.,
- Majority of 74.6% respondents mentioned that coverage of e-journals is insufficient for research is the main difficulty with regard to utilization of the e-journals, 62.6 % of the respondents were replied time consuming.
- Most of the 64.0% of the respondents are satisfied with the e-journals, and 20.0% of the respondents are highly satisfied.

7. Conclusion

The Internet has attracted the attention of the users as an easy source of accessing information and e-resources as is evident from the above study. Yet, only a sizeable number of research scholars could frequently seek information from e-journals. Most of the scholars access e-journals for their research work on their respective subjects. Majority of the scholars found that coverage of e-journals is insufficient for research is the main difficulty with regard to utilization of the e-journals, and indicated that the coverage e-journals should be sufficient for effective utilization. The university library should play a pivotal role in facilitating the users in the use of e-journals and other library and services.

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Use of E-Journals in Dental College Libraries of Uttar Pradesh: Comparative Study

Durga Prasad **Manoj Mehta** **Jitendra Srivastava**

Abstract

Knowledge has grown over the years from past to the present day. We are living today in an age, which is called the age of knowledge explosion. The aim of this study is to analyse the use of the periodical in Dental college libraries of UP. A Well-Structured questionnaire was distributed among the Doctors, Residents, PG Students and UG Students .of all the Dental College's under study.

Periodical, Collection, Dental College Libraries

1. Introduction

In 1952 rose Vormelker pointed out the Medical and Dental College Library potential of the public library, where the subject departments are in fact medical libraries within the framework of the public library; a similar observation applies to the subject departments in an academic setting. When her observations of such potential are read in light of the 1912 observation today the term Dental College Library exists in at least two senses: The general, which includes dental libraries and collections of many types and the specific, indicating the library which provides specialized information service to the dental scientists.

2. Objectives

- To facilitates the librarians or information scientist to guide the researcher in the direction of sources including e-journals.
- To help in searching journals which are not familiar to the users.
- To train the people to use electronic information sources available at national and international level.

3. Scope of the study and Limitation of the study

There are 25 private dental colleges in U.P. out of which 6 dental colleges are recently established and few are not properly developed. Therefore the study covers 50% (12 in number) of the total dental colleges:

Table 1: List of Dental Colleges under study

S.N.	Dental College	Abbreviation
1	Chandra Dental College and Hospital, Barabanki	CDCHB
2	Dental College and Hospital Aligarh	DCAHA
3	D.J.College of Dental Science & Research Modinagar	DJCDM
4	Hindustan Institute of Dental Science, Greater Noida	HIDCN
5	Indraprastha Dental College, Sahibabad	IPPCS
6	Kanti Devi Dental College & Research Centre, Moradabad	KDCRM
7	Kothiwal Dental College, Moradabad	KWDCM
8	Rama Dental College, Kanpur	RADCK
9	Saraswati Dental College, Lucknow	SADCL
10	Shree Bankey Bihari Dental College, Ghaziabad	SBBDG
11	Teerthankar Mahaveer Dental College, Moradabad	TMDCM
12	U.P. Dental College & Research Centre, Lucknow	UPDCL

A detailed study of these colleges will be made relating to their information need resources particularly e-periodicals, resource sharing, networking, human factor and the services provided by them with modern resources available.

4. Methodology

Survey method has been applied in this dissertation work. A survey will be made to all dental college libraries. A questionnaire has been prepared to collect data from 12 colleges.

Two questionnaires have been constructed.

- Questionnaire for librarians
- Questionnaire for (Doctors, Residents, PG students, UG Students).

About 468 Questionnaire were distributed among the respondent (Doctors, Residents, PG Students and UG students) send of which 384 Questionnaire received for data collection. The study will depend on primary and secondary, sources available in the dental college libraries in addition to questionnaire. It will include budget and procedures of selecting and maintenance of journals. Statistical analysis will be made on the basis of data collected. Tables, charts, diagrams will be prepared to represent the state of the art of Dental colleges.

5. Analysis of Dental College Libraries of Uttar Pradesh:

Table 2: Housing of Print Journals 2012-2013

	Separate stack for periodicals	Foreign Journals	Indian Journals	Other Journals	Total
1. CHCHB	No	15	65	25	105
2.DCAHA	No	25	150	45	220
3.DJBDM	Yes	19	110	40	169
4.HIDSG	No	10	50	20	80
5.IPDCS	Yes	07	68	19	94
6.KDDCM	Yes	09	135	38	182
7.KDCRM	No	09	60	18	87
8.RMDCK	Yes	22	130	28	180
9.SWDCL	No	35	130	48	213
10.SBBDG	Yes	15	46	23	84
11.TMDCM	No	18	62	35	115
12.UPDCL	No	33	125	28	186

Table 3 – Respondents

Respondents	Questionnaire Distributed	Questionnaire Responded and Considered	Percentage %
Doctor	120	96	25.00%
Residents	72	60	15.63%
PG Students	96	84	21.87%
UG Students	180	144	37.50%
Total	468	384	100%

The table 5 shows the survey status of respondents 12 Dental Colleges were selected in the basis of their strength and development. 468 Questionnaire were distributed to 4 categories of users out of which 384 were considered for study and found property filled.

Table 4: Respondents Statement

Resource	Respondents									
	Faculty	%	Residents	%	P.G. Students	%	U.G. Students	%	Total	%
1.E-Journals	66	24.53	48	17.84	71	26.39	84	31.23	269	70.05
2.Full Text Database	12	19.67	08	13.11	07	11.47	34	55.74	61	15.88
3.Bibliographic Database	18	33.33	04	7.41	06	11.11	26	48.15	54	14.06
4.Other	-		-		-		-		-	
Respondents	96		60		84		144		384	100%

The table 4 shows that E-Journals are accessed 70.05% while full text database has been accessed 15.88% and Bibliographical database 14.06% it shows that E- Journals are accessed to maximum in the other hand faculty, Residents and P.G. Students are using e-journals most than other resources. But U.G. Students are using full text database 55.74% and bibliographical database 48.5%.

Table 5:-Respondents Preference for periodicals

Resource	Respondents									
	Faculty	%	Residents	%	P.G. Students	%	U.G. Students	%	Total	%
1.Sufficient quantity to meet user need	07	14.58	05	10.42	15	31.25	21	43.75	48	12.50
2.Subject relevance	19	32.76	09	15.52	07	12.07	23	39.65	58	15.10
3.Cost effectiveness	11	29.73	06	16.22	09	24.32	11	29.73	37	9.64
4.Authenticity of Information	14	25.00	12	21.43	11	19.64	19	33.93	56	14.58
5.Currency of Information	15	27.78	10	18.52	17	31.48	12	22.22	54	14.06
6. Easy access	30	22.90	18	13.74	25	19.08	58	44.27	131	34.11
	96		60		84		144		384	100%

The table 5 shows most of the users preferred periodicals because of currency of information (14.58) and easy access (34.11).On the other hand cost effectiveness has not proved any difficulty faculty and residents students free that periodicals are sufficient to meet their needs.

Table 6 - Made of selection of periodicals preferred by Libraries

	Libraries (Total 12)	Percentage %	Central Average %
1.Users recommendation	2	16.67%	6.67%
2.Scanning	5	41.67%	16.67%
3.Surfing Though website	4	33.33%	13.33%
4.List service catalogues	6	50.00%	20.00%
5.Consulting other libraries	2	16.67%	6.67%
6.Faculty consultation	11	91.66%	36.66%
		250%	**100%**

The table 6 shows that majority of the libraries preferred to purchase periodicals on the hairs of faculty consultation (91.66%)and while 6 libraries take help of list and catalogues of publishers (50%) others made are also used but not so popular among libraries.

Table 7 - Barriers in accessing e-periodicals

Resource	Respondents									
	Faculty	%	Residents	%	P.G. Students	%	U.G. Students	%	Total	%
1.Less opening hours	07	12.50	03	5.36	21	37.50	25	44.64	56	14.58
2.Charging fee of accessing	01	2.50	02	5.00	18	45.00	19	47.50	40	10.42
3.lack of proper guidance	01	3.70	03	11.12	12	44.44	11	40.74	27	7.03
4.Lack of printing facilities	12	21.83	09	16.36	09	16.36	25	45.45	55	14.32
5.In sufficient e-recourses	14	28.57	08	16.33	06	12.24	21	42.86	49	12.76
6.Technical problems	39	49.37	19	24.05	04	5.06	17	21.52	79	20.57
7.Electicity failure	01	9.09	03	27.27	02	18.18	05	45.46	11	2.86
8.Inadequqte hardware & software	20	42.55	11	23.40	07	14.89	09	19.16	47	12.24
9.Lack of knowledge of accessing	01	5.00	02	10.00	05	25.00	12	60.00	20	5.22
	96		60		84		144		384	100%

The table 7 shows the barriers come before users while accessing e-periodicals. The main barriers faced are to technical problems (20.57%), inadequate hardware & software (12.24%) less opening time (14.58%) and lack of printing facilities (14.32%).

6. Users and User's Need

Users of Dental College libraries are as varied as the types of libraries they patronize. In each library environment and in each type of Dental college library, library users can generally be grouped into four categories:

- **Professional:** This group includes members of faculties, scientific researchers, and practitioners such as medical doctors etc.
- **Semi and Pre Professional:** This group consists primarily of students in Dental Colleges assistants working for scientists, and medical researchers.
- **Professional:** This group includes mainly professionals of other fields who are interested in scientific information, such as environmentalists, consumer etc.
- **Non-Professional:** This group consists mainly of members of the general public who do not belong to the above three classes.
    - Selection tools
    - Guides to the literature
    - Bibliographies
    - Statistical sources
    - Guides and field guides
    - Abstracts and indexes and current awareness series
    - Periodicals

- conference proceedings, translation, dissertations and research in progress preprints, and reprints
- Patents and standards
- Trade literature
- Non print materials
- Professional scientists and their publications
- Database

Some of the above categories include more than one type of source. Grogan categorized the literature of Dental and Medical libraries into the following broad areas:

- **The Primary sources:** The bulk of this category is made up of the original reports of Medical investigations. Some these records may be largely observational or descriptive. The primary literature represents new knowledge and the most up to date information.
- **Secondary sources:** They are compiled from the primary sources.
- **Tertiary sources:** These are essential aids to facilitate the use of both primary and secondary sources.

7. Dissemination Service

Dissemination of information can take many forms and be fairly simple process or a highly structured and complex service. Below is a list of the types of dissemination that may take place in dental college libraries.

- Journal article photocopies
- Journal article lists
- Newsletters
- Abstract bulletins, including short summarize of journal articles
- Acquisition newsletters listing new information sources available
- Journal circulation
- Patents and standards bulletins
- Data on a particular subject of common interest
- Report writing and summarizing of Information
- Electronic delivery of journal articles
- End user searching – putting research and information tools onto users desks

8. Findings

- The journals subscripted in dental colleges ranges between 352 to 1580 but majority of the colleges subscribed bellow 800 journals which is not sufficient.
- The budget for journals ranges between 18 to 35 lakhs which seems to be sufficient.

- So far as an information network in concern all the dental colleges have internet connected but all have used different networks to meet their needs.
- In majority of the colleges documents delivery service has been provided in 50% colleges and the mode used in e-mail is (60%), CD-ROM (30%),.
- E-resource including e-journals, e-books and CD-ROM database but e-journals (50%), CD-ROM database (30%), are mostly used in dental libraries. So far as the resource media cousins life transfer (15%), video conference (15%), are used but photo copy services are provide in (80%), colleges.
- It was found that UG-Students consult e-journals to update than with current events while faculty used e-journals most for preparing for teaching aid and research activities.
- 65% Librarians are emerging as virtual library. E-library while 35% librarians are in process.
- All Librarians are extricable using internet services.

9. Recommendation

- Dental colleges should increase their facility of internet.
- Every Dental college is common in service. There program are common. There staff to update their knowledge, More over the colleges should provided necessary facilities off line and recommend the library professionals to attends workshop , seminars and conferences.
- Every dental college should make available the necessary of the users.
- E-journals are costly as their price increase every year, hence dental colleges should establish there database (CD-ROM, DVD) and connect them online to access their resources.
- To meet the demands of e-journals and to reduce more expenditure, each dental college should subscribe consortia.
- There should be more number of terminals of computer system to provide Internet services to majorities of users.
- An annually evaluation of library services and identify the needs of the dental community.
- A dental college library should be aware with knowledge resource to provide efficient and accurate service to the user.

10. Conclusion

The Dental college library have developed there resource to meet the need of users but it is not sufficient because of the new emerging technology and change to digital library format. More and more bibliographic and full text information are being made available in an electronic form this change in Information Technology (IT) environment has found the librarians to be update with the latest development and guide the users. Meanwhile, support for higher education increased significantly after the setting up of the ICMR (ICDR) and as a result more Dental colleges were established during the 21st century. In the portals of the institutions of higher education more students and larger facilities. Also, there has been a change in the teaching methods (from the traditional lecture method to lecture and discussion method), examination system (i.e. switching over to the semester and trimester systems), and new areas of study, new research methods, new research interests (including interdisciplinary research), etc. All these resulted more library materials and more library services.

Keeping in view the increasing library and information requirements of the users for teaching and research purposes the libraries in our country strived to develop their collections in future. They tried to procure maximum documents within the budgetary constraints. In spite of this, it was discovered during the survey, that in most of the cases neither the library personnel were satisfied with their collection nor did the users find adequate enough from their standard.

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Use of Online Public Access Catalogue (OPAC) among PG Students, Research Scholars and Faculty members of CCSHAU, Hisar: *a Survey*

Rajinder Kumar **Joginder Singh** **Balwan Singh**

Abstract

The present paper describes about the sample survey conducted from the Post Graduate, Students, Research Scholars and Faculty members of CCSHAU, Hisar. For this the questionnaire was circulated among the 150 users but the response was received from 137 respondents which is 93.3%.The paper also discuss about the objectives of the study, review of literature, and presents data in tabular forms with analysis and interpretation of each table. The study reveals that maximum PG students use OPAC which comes to 44.6%. It shows that 61.3% male use the OPAC while by female users, it is 38.7%. The study also highlights that 98.5% users are aware of use of OPAC and searching through 'Title' index is the most favoured as this approach was used by 72.9% users. The maximum respondents come to use the OPAC to know the availability which is 52.5% and while being available on screen help on home page of OPAC, it is not used by 79.6% users. The study also points out that only 8% users are not satisfied with existing facility of OPAC while 38.7% respondents find that library staff is always there to help them.

OPAC, Users Awareness, Users satisfaction, On Screen help and Users satisfaction level.

1. Introduction

The agricultural University libraries usually provide the information for the agricultural scientists/ users. The agriculture library is a place where teachers, students and other community of the users acquire agricultural related information for the benefit of their academic performance. In the rapid changing world of agricultural information remote access to library documents and services is easier in the comparison of past scenario. The agricultural university libraries are planned to help agricultural users. The Library catalogue helps the users to locate the library resources and availability in the library. Library Catalogue is the most important information retrieval system in the context of a library. The library catalogue provides facilities to the users in consulting and retrieving the bibliographical details through some searching options. The latest tool of library catalogue is OPAC/web-OPAC. OPAC/web-OPAC is an online computerized bibliographic database which has a catalogue of documents such as books, thesis, journals, magazines, project reports, audio-video documents and other different types of reading materials available in the library. According to Heiliger and Henderson "An Online Public Access Catalogue (OPAC) is a library catalogue accessed via a computer terminal for the benefit of library users." According to O'Brien, "An OPAC (Online Public Access Catalogue) is a database of bibliographic records describing the holdings usually of one particular library. It allows searching by name, title, and subject, and offers online access through public terminals."

2. About Nehru Library, CCSHAU, Hisar

The year 1975 is a land-mark in the history of the Nehru Library, as it had been officially dedicated to the "Chaudhary Charan Singh Haryana Agricultural University, Hisar" which was established on February 2, 1970 vide Act No. 16 of 1970. At present it has a rich collection nearly 3.5 lakh volumes. The Nehru library of CCSHAU, Hisar was being automated in the year 2001. The Nehru Library has also developed the database of its holdings using the library software package "LibSys. The Online Public Access Catalogue (OPAC) facility available in this database helps the library users to consult the documents available in the library. The library users consult the library OPAC within the campus of the library and also consulted online catalogue with the help of internet connection. The users use this facility to consult for books, theses, journals and other types of reading material available in the library of their interest and to know about the availability of the required documents. The Nehru Library is equipped with all the modern technologies such as, Multimedia Library, Video Conferencing, CDROM Databases, Internet and Smart Classroom etc.

3. Objectives of the study

To study the use of OPAC among the PG students, Research Scholars and Faculty members, the following objectives have been defined:

- To study awareness about the OPAC
- To acquire knowledge of using OPAC by Category, Gender and Age wise distribution of the users.
- To discover the various searching options used by the users.
- To point out the problems faced by the users in the use of OPAC.
- To suggest the suitable measures to improve the facilities in the use of OPAC.

4. Scope of the study

The scope of the study encompasses the usability of OPAC by the users in the Nehru library CCSHAU, Hisar. The study includes the three categories of the users i.e. Post Graduate students; Research Scholars and Faculty members in the university. The regional centers/KVKs of this university have been excluded from the study.

5. Methodology

The survey method of research has been adopted to carry out the present study. Keeping in mind the objectives of the study the questionnaire methods was used to collect the data. Besides, questionnaire methods, observation and interview techniques were also used in the study. The genuine data was collected from the respondents personally by the researcher. In this study a sample of 150 questionnaires was taken and distributed in the users but only 137 users responded back.

6. Review of Literature

The computerization of cataloguing data has resulted in library catalogue facility for the users. Library catalogue has made bibliographic information search more-speedy and user friendly besides providing additional access points. A number of studies are being conducted in different parts of the world on various aspects of use of OPAC and Web-OPAC. Some of such studies have been reviewed here.

Devendra and Nikam (2013) examined the attitude of law university library users towards the use of OPAC/ Web OPAC in Andhra Pradesh. The study revealed that the majority of the respondents (i.e. 87.7 per cent) were used to OPAC/Web OPAC. Most of the respondents (i.e. 58.2 per cent) stated that their use of it was guided by library staff. In this study the largest number of respondents (i.e. 26.8 per cent) agreed that they learnt to use of it from their friends. The analysis found that the respondents have positive attitude about the use of it. **Fabunmi and Asubiojo (2013)** studied the awareness and use of Online Public Access Catalogue (OPAC) by the students of Obafemi Awolowo University, Nigeria. The study showed that 68.7 per cent of the respondents were aware of the OPAC services. Only 19.8 per cent of the respondents used OPAC to access library resources. Most of the respondents faced some problems like irregular power supply, network failure and shortage of computer systems. **Narang and Singh (2013)** studied the use of online public access catalogue by the research scholars of Guru Nanak Dev University, Amritsar. In this study the majority of the user's access information (i.e. 73.7 per cent) used both the OPAC and Card catalogue. The study showed that 40.1 per cent users used it occasionally and 23.7 per cent once in a week while only 9 per cent used it daily. The most commonly used searching options were authors or title approach. **Sankari and others (2013)** studied the use of online public access catalogue (OPAC) by the students and faculty members of Unnamalai Institute of Technology in Kovipatti (Tamiladu). In this paper they discussed the various aspects of OPAC such as frequency of use, purpose, ease of use and satisfaction level etc. The study revealed that most widely used search was author and title search Almost users were happy from the OPAC services.

Qadri (2012) investigated the use of OPAC among the four faculties of University of Kashmir as document retrieval tool: a case study of the University of Kashmir. The majority of the users i.e. 74.58% searched the library materials on the shelves directly followed by only 60 per cent through OPAC. The most general search strategy adopted by the users was author or title. **Yusuf (2012)** studied the utilization of online public access catalogue (OPAC) at the Lagos state polytechnic library in Nigeria. Most of the users used it 36.94 per cent twice in a week. 100 per cent of the users used it for finding information materials from the library.

Ruzegia (2011) studied the usability of OPAC interface features: the perspective of PG Students in two faculty department of Library & Information Science and Information Technology at International Islamic University Malaysia (IIUM). The results showed that 100 per cent respondents were aware of the OPAC and its interface features. **Shiv Kumar (2011)** studied the effect of web searching on the OPAC: a comparison of selected university libraries of the Punjab region viz Panjab University, Chandigarh (PUC), Punjab University, Patiala (PUP) and Guru Nanak Dev University, Amritsar (GNDU). He found that the frequency of using OPAC by PUP was very frequently. The study revealed that the majority of the respondents in PUP used the simple search technique very frequently. **Velmurugan and Amudha (2011)** examined the use of OPAC by the users of VHSN College. Most of the respondents accessed OPAC through author and title approaches and consulted it for finding the documents in the library. The majority of the users were highly satisfied in accessing OPAC.

7. Data interpretation and analysis

- **Use of OPAC by Category of Users:** To observe the use of OPAC, a survey was conducted among the users of Nehru Library, CCSHAU, Hisar. In this survey a total 150 questionnaires were circulated among the Post Graduate (PG) Students, Research Scholars, and Faculty Members. Out of 150 a response of 137 respondents received back which comes 91.33%. Table No.1 shows that out of 137 respondents, 44.6% PG Students responded where as Research Scholars comes to 37.9% and Faculty Members are 17.5% which is the lowest in the respondents.

Table 1: Category Wise Use of OPAC

Category	No. of respondents	Percent
PG Student	61	44.6
Research Scholars	52	37.9
Faculty members	24	17.5
Total	137	100

- **Gender Wise Distribution:** From Table 2, it can be concluded that Male respondents were 61.3% and female respondents were 38.7%. From this table it can be concluded that male respondents are high due the reasons that this is agricultural university.

Table 2: Gender Wise Distribution

Gender	No. of respondents	Percent
Male	84	61.3
Female	53	38.7
Total	137	100

- **Age wise distribution:** This table indicates that maximum users of OPAC are between age group of 18-25 years which is 40.1%, followed by the age group of 26-30 years which comes to 32.9% and minimum users are of age group of 31 years and above it which is 27%. It came to notice that who should use the library maximum, i.e. faculty members, they visit the library minimum. If faculty members are not coming to the library, how they can use OPAC and other resources of the library.

Table 3: Age Wise Distribution

Age	No. of respondents	Percent
18-25	55	40.1
26-30	45	32.9
31 and above	37	27.0
Total	137	100

- **Awareness of OPAC:** It is matter of great satisfaction that 98.5% respondents are aware of use of OPAC. It is because Nehru Library is using OPAC facility since 2001. Moreover there is orientation program at the beginning of the session in which the library faculty through the lecture tells the new entrants how to be the members of the Nehru Library and how they can use the resources of it including use of OPAC.

Table4: Awareness of OPAC

Awareness	No. of respondents	Percent
Yes	135	98.5
No	00	00
Somewhat	2	1.5
Total	137	100

- **Information Search Pattern:** There are many indexes to search the specific information from the OPAC such as author, title, classified, subject, place, publisher, word in title and combination search. These searches are also shown in table No. 5 also. To find particular information from the holdings of the library user has either to know the surname of the author or title of the book.

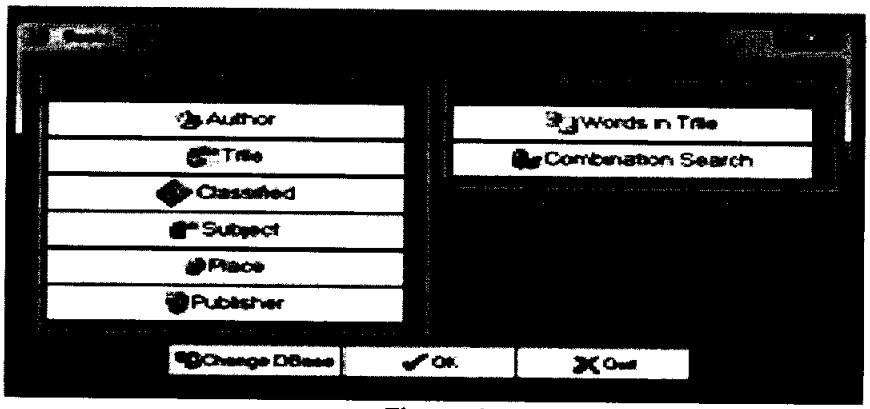


Figure-1

The books can be searched from the place of publication or through publisher. User can also search the book in case he/she know the only one word available in the title. If the user does not know anything mentioned above but wants to know about the literature available in the field, then he can use the combination search. The Table No. 5 shows that title index is used by the maximum users which come to 72.9% followed by the author index which is 48.9%. This is because it is easy to remember title or author of the book. Moreover the in case of students and research scholars, they got maximum information from their teachers/guides who tell them about author and titles and then indicates about their availability in the library. The combination search was used by minimum respondents which is 6.6%.

Table-5 Information Search pattern of OPAC

Pattern	No. of respondents	Percent
Author	67	48.9
Title	100	72.9
Classified	12	8.8
Subject	36	26.3
Place	17	12.5
Publisher	13	9.5
Words in title	32	23.4
Combinational search	9	6.6

- **Purpose of Using OPAC:** Nehru Library has installed 4 numbers of OPAC terminals at its 1st floor. All the users coming to the library can access these terminals to have desired information. The table no. 6 describes that why the respondents are using OPAC. What is their purpose i.e. whether they want to search OPAC to have the document for issuing or reading in the library or if the document is not available in the library but the library has purchase the same. In that case they wanted to k now its location of to whom it has been issued. The table shows that 52.5% uses OPAC to have the availability of document in the library while only 15.3% respondents just want to search the OPAC to know the no. of copies available in the library.

Table No 6-Purpose of using OPAC

Purpose	No. of respondents	%
Availability of the documents	72	52.5
Location of the documents	22	16.1
Bibliographical details of the documents	22	16.1
To check the no. of copies available in the library	21	15.3
Total	137	100

- **Awareness about On-Screen help/user Assistance:**Most of the Library & Information Management System (LIMS) Software provides on screen help to the users so that they can easily search the required information without asking from other persons.

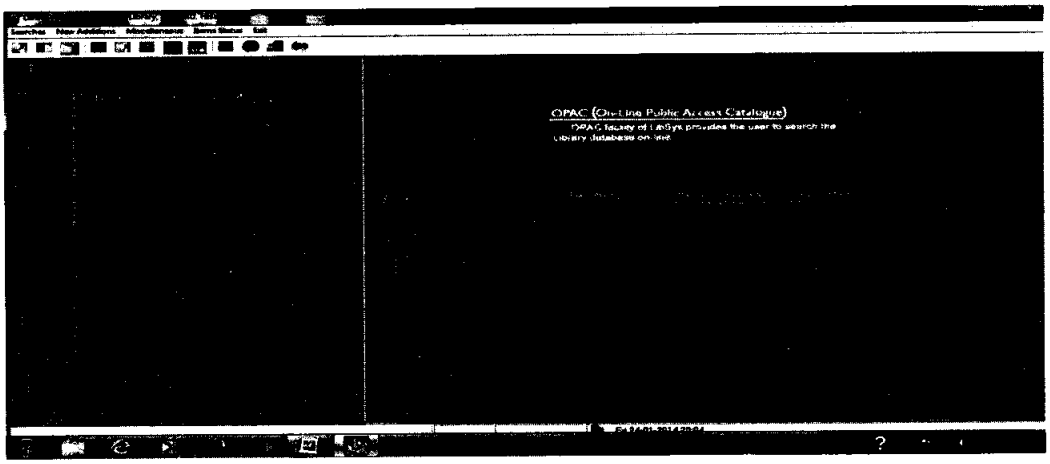


Figure-2 showing on screen assistance

But the Table No. 7 describes that 79.6% respondents are not aware of this facility available in the OPAC.

Table-7 Awareness of on screen help/user assistance

Awareness	No. of respondents	%
Yes	28	20.4
No	109	79.6
Total	137	100

- **Satisfaction Level of Users:** As everyone knows that we are living in the Digital Era. Though the orientation training is provided to every new user yet some of them not attend the same of may be not available by one or other reasons. Library staff is also there to help the users yet some of the users still do not know how to use OPAC. Yet the survey shows that 35.3% users are very satisfied with the information available in the OPAC while only 8% respondents are not satisfied with OPAC facility.

Table- 8 satisfaction level of the users

Satisfaction	No. of respondents	Percent
Very satisfied	48	35.3
Satisfied	47	34.3
Partially satisfied	31	22.6
Dissatisfied	11	8
Total	137	100

- **Availability of library staff for assistance:** OPAC is available in Readers Service Division (RSD) of Nehru Library in which three or four library staff is always there. Moreover library faculty is also there to assist the users. Users take help of the library staff not only at OPAC but also at the CDROM Databases and Internet Lab. The table No. 9 shows that 38.7% users find the library staff is always there to help them. It also shows that 21.9 % user find the staff is never there to help them in finding the required information from the OPAC.

Table-9 Availability of library staff for assistance

Availability	No. of respondents	Percent
Always	53	38.7
Usually	35	25.5
Occasionally	19	13.9
Never	30	21.9
Total	137	100

8. Suggestions

At the end of the questionnaire, users are asked to provide suggestion to improve the OPAC facility at Nehru Library. Some of the important suggestions are given as under:

- Touch Screen computers should be installed with advanced features.
- At least One OPAC terminal should be installed in each hostel buildings.
- One OPAC Terminal each at 2nd floor and 3rd floor should also be installed in Nehru Library
- The desktop of OPAC Terminals should not be overloaded with the files and folders

9. Conclusion

Most of the university libraries are providing the OPAC facility for their users. Such types of studies are of very much importance for the university libraries as the library administrator come to know about the usefulness as well the weakness of the system. At the same time library professionals also come to know about the perspectives of the users in terms of their seriousness and importance of the library and problems facing in using the new technology in the library.

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A tool for Redesigning of Library Services: "Google Sites"

Anand S. Gawadekar



This article enounces an innovative and integrated way for Library and Information Science Professionals (LIPS) to create library website for the re-design of library services as per their views. The prime objective of LIPS is to provide the desired information and reduce the gap between resources and users with no bar of time, money, place, and manpower. "Google Site"; A magnificent facilities of this tool (Google Sites) is easy to learn, readily accessible, inexpensive way, and 24/7 availability.



Google Sites, Library Website, Free and Open sources Tools,

1. Introduction

In the Intellectual societies, author's views about the role of library professionals are "to create a path for generation of knowledge is the prime objective of LIPS". Information Technology has gone through a phase of unprecedented expansion, with huge increase in the volume of information and quantum jump in the level of information technology.

Library websites provide an according to Chen, D.Y., Chu, S.K. and Xu, S.Q (2012). "innovative and effective way" (pg. 1) of dissemination the information to multiple users in real time access and at the lowest cast and 24/7 availability. This is the crucial demand of our Intellectuals society.

In the open source era, a number of tools are available to create, design, and implement in library services and play a pivotal role for transforming the need of intellectual society. The need of era and prove the necessity of the library professionals, therefore, there is a need for a library website which will help manage, dissemination and updated the library resources to library users by using the open and free source of technology. A number of tools and techniques are available to create and design websites with number of limitation and barriers in implementation in library services. According to Richard Byrne (2012) we can create a website by using the following tools.

- WIX
- Whatfolio
- Weebly
- Webs
- Yola
- Google Sites
- School Rack
- Web Node
- Smore
- Checkthis
- Page O Rama
- Kafafa
- Lifeyo
- Jimdo
- Snap Pages

The advantages and disadvantages are varies by tool to tool for creating and maintain the library websites. As a users friendly tools and technology of Googles, author took a step to develop a model of library website for an academic library through using the Google site tool. This model is found to be very helpful to

the library users, staff and library resources, and also help in smooth functioning of library. This site provides all the necessary details to library users, & library staffs. This library website (http://sites.google.com/site/sdglibrary) has reduced repetitive task of library staff and its users & provided the optimum information, in optimum time & optimum form, to its users, and saved the time, money, manpower, resources of library staff & library users.

2. Objective of the Study

According to Shapiro, S. (2010), "declining of library budget" (Pg. 53) library professional mend to implement the Free and Open Source tools and technology. According to Ciszek, M.W. (2010). All most every LISPs seeking to keep up-to-date on emerging tools and technologies and try to implement them into library services for optimum satisfaction of users". (P.62). In the era of emergence of ICTs, Gawadekar, A.S. (2013) said, "Librarians need to play a scientific role to provide optimum information in optimum time and form to right user" (P.388). As a professional views of to Choubey, N.S. and Gawadekar, A.S. (2012) "the primary objective to provide the maximum services & facilities to library patrons by innovative vision & implementations of the open sources in library & information Science field".(Pg. 663) .The prime objectives of this study are as follows.

- To learn how to create and design a websites through Google sites
- To develop a model of library websites
- To understand the technical issues
- To find the solution for any query
- To help for the library professionals
- To create a feedback mechanism
- To learn users perspectives
- To work in Virtual Era
- To save the environment
- To develop a technosavey professionalism
- To change the views of library professionals
- A step for traditional to modern services
- To develop the easy access system

3. A Practical Overview of library's websites model

"User's satisfaction is our motto" the theme of Library is derived by Gawadekar, A.S. According the Choubey, N.S. and Gawadekar, A.S. (2012) "providing the maximum facilities to our library members and satisfaction with the library, we developed a virtual library with using the open sources".(Pg. 663). This model is very helpful in satisfaction of library users and also smoothest functioning of library. According to Shapiro, S. (2010), "while web site handled many our needs well, we soon recognized" (Pg. 53) that we also needed a library website to expedite to develop/create website which is free and open source for the facilitated the library services to users. We evaluated more major online websites tools, Google sites, Yola, and etc. free and open sources tools to determine whether they could be customized to help what we required. After practical experiments and smooth functioning perspectives, it became obivious that Google sites were better suited to the kind of the system that we required and needed to LIPS. While creating a library websites by Google Sites tool, several components of the model are covered in the following sub-sections i.e. creating, designing, visibility, Updating, Storage Capacity, and an experimental model for in library services.

4. **Creating a web site:** To create a website in Google Sites LIPS has to complete the following steps:
   - First, l we need to open Google account to utilization of Goggles Tools
   - To Log with Google
   - To go to the link (https://sites.google.com/), we will see in following figure1 the for creating tool website.

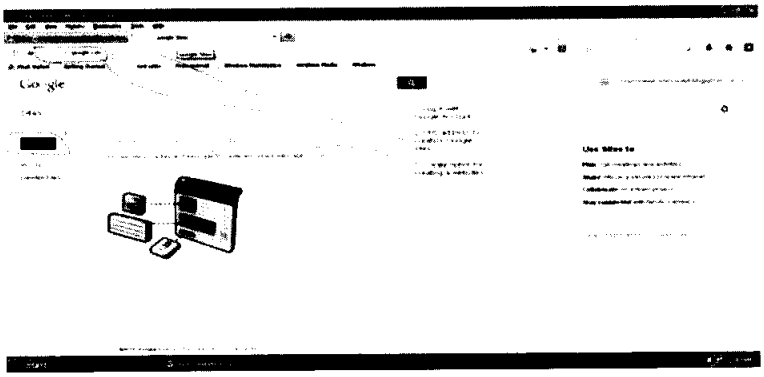


Figure1: How to create website

- After the 2nd step, to give a name, select the Template, URL address for site. A number of varieties are available to select the Templates for designing and good appearance of the website. We can also design our own template to select the blank template. Figure2 depicted the features of this tool.

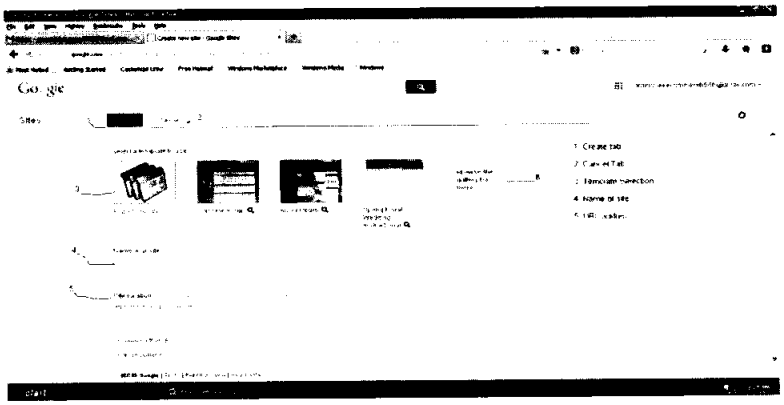
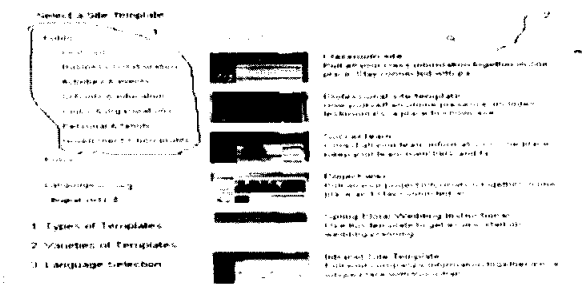


Figure 2 - Features of Google sites tool

- Language is a prime barrier of communication, so it is a wonder full option in Google tools that, we can create a site in world renowned languages tool. We can choose the types and varieties of template which is free and open sources. Figure 3. Depicted these facilities of Google.



Figur 3 - Facilities of Google sties tools

- After selection of Templates and Language, type the verification code and click at the create Tab. Figure no.4 will depicted the tools.

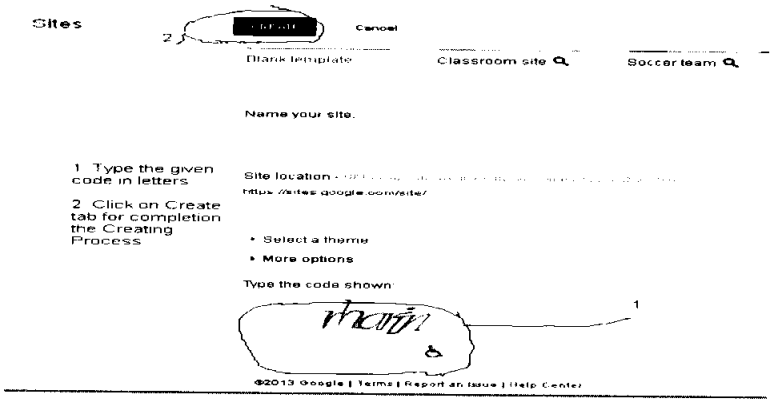


Figure 4 - Google Site creation

4.1. Designing a web site: Websites appearance is play a key role for the attraction of the users. Library Professionals should have to know the site appearance is the matter of designing. Before designing library web site, LIPS should visit another library websites for getting the idea and descent looking. Google sites have an option to design the websites. Figure no. 5 depicts the designing tools.

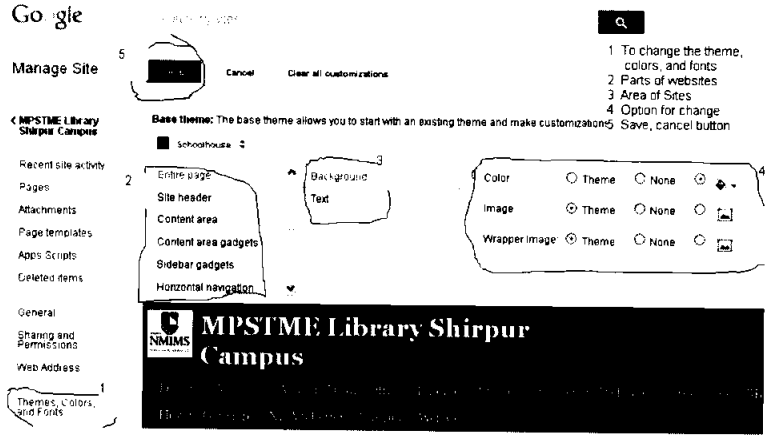


Figure 5 - The designing tools

4.2. Visibility of web site: Privacy is a matter in intellectual society. Google site has good facilities to maintain the privacy and authenticity of users. Website's administrator has right the accessibility, updating, and visibility of website. It has three options for the visibility.

- **Public on the Web**: anybody can access the site on the Internet, no need of authorization required; 2.
- **Anyone with the link**: Who has the link of sites can access. No need of authorization and;
- **Private**: For access the sites; it requires the permission to administrator. It is a good facility of library professional as well as users to get authenticity of users. Figure 6 depicted the feature of authentic and visibility of site.

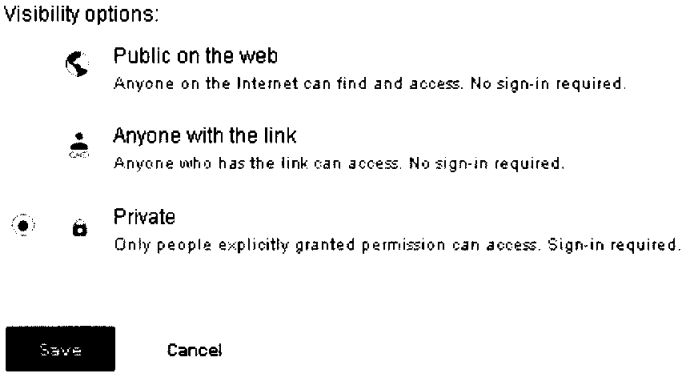


Figure 6 - An authentic and visibility of site

4.3. **Updating of web site:** Change is the rule of nature. Up gradation is necessary for all to survive in the society. In the intellectual society, it is crucial demand due to exploration of information. Library professionals need to provide the updated information to the users. As earlier said, website is a key point to access the information. So library websites should be updated in time. LIPS can update the information by their own hand by using the Google sites. It has an option to edit, delete, change layout of sites, particular pages and other. Google site has a wonderful option to mange a feedback/ inform to administrator for any changes via the E-mail. Figure no. 7 depicted the facility of updating the site.

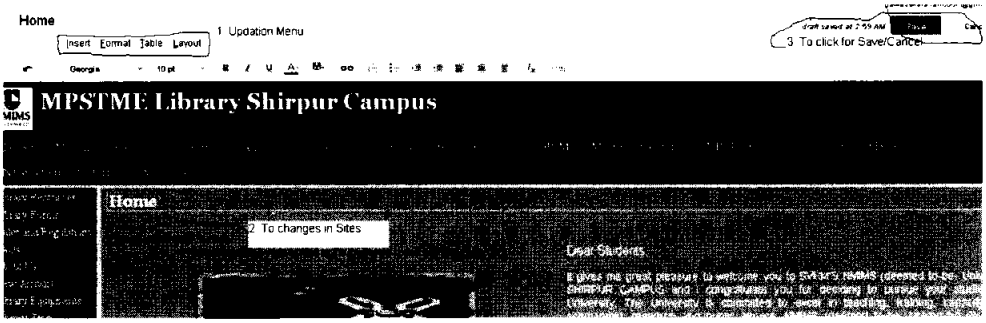


Figure 7 - depicted the facility of updating the site

And figure no. 8 depicted that Google has a powerful mechanism to inform the administrator for any changes in site by mail all necessary information about the modification in site i.e. who, when and where changes has been made. Figure 9 depicted these tools facilities

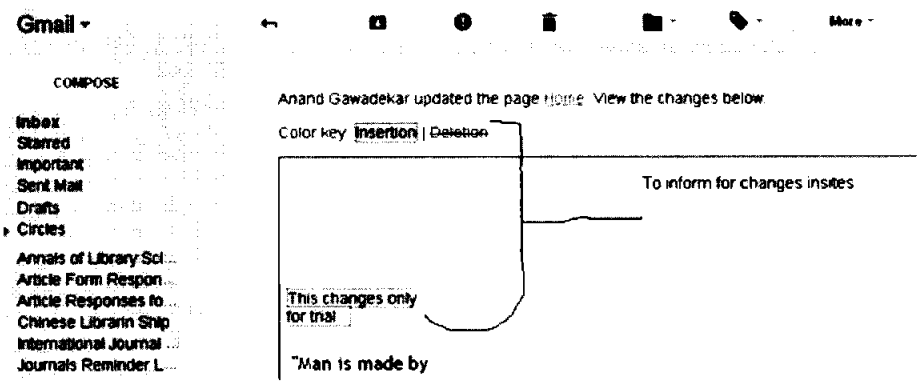


Figure 8 - Information mechanism for Administrator of website

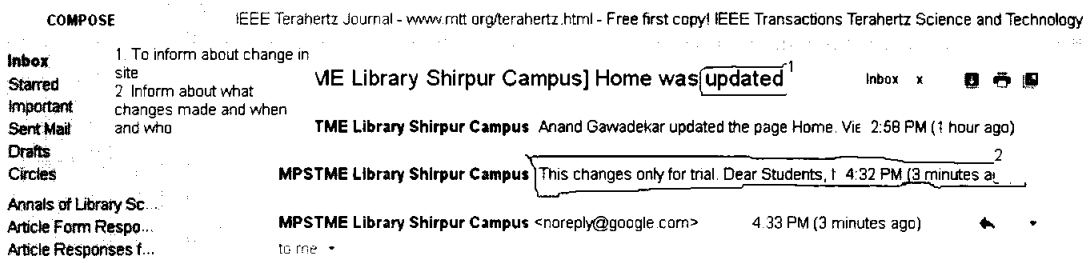


Figure 9 - who, when and where changes in site

4.4. Storage Capacity: Google site provide 100mb data storage capacity and it is expendable as per the term and conditions of Google. As per authors experience and knowledge, there are no need extended to storage capacity due to delete the old information and keep it in Google Drive which provide 16 GB storage capacity. And if we need more than this we can save data in other storage device.

5. A paradigmatic model:

Information and Communication Technologies open opportunities for Library and Information Science Professionals to provide the information in the right time and desired form at the user's place at the least cost. Author believes is a technosavey Library Professional, he strive to learn new techniques and try to implement in the profession. Author create at website for users centric approach to use the Google tools; Google sites. Choubey, N.S. and Gawadekar, A.S. (2012) "attributed to the following factors for the Library Website.

- Emergence of Internet and Web technologies as a media of information and storage access.
- Advances in online storage technologies enabling storage of large amounts of data at nun of cost/free of cost.
- Whenever & Everywhere (24*7*365) availability.
- Continuous cost reduction, reducing unproductive efforts and eliminate rework.
- Providing user driven/oriented services
- Teamwork, total participation i.e. installing team culture for problem and improving methods
- Continuous quality improvement and total commitment to quality
- Users satisfaction is main objective
- Providing uninterrupted services in 24*7*365."(Pg. 663)

Figure 10 will depicted the creation of Library website, which play an important role for smooth functioning the library and user satisfaction at least cost.

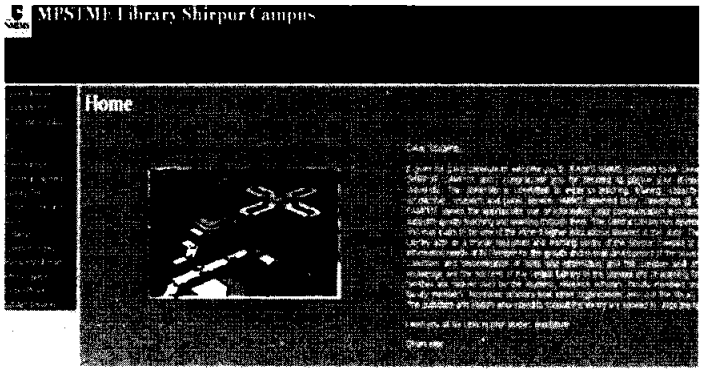


Figure 10 - A Library website through Google Sites

As per the knowledge, belief and the gist of practical implementation, the advantages of the Library Websites are discussed as follows:

- To provide Quality of service
- Promotion of Library services and resources
- Customization of Library services and resources
- Real time access
- 24/7 availability of library services
- Multiple and Real-time access of library
- Reduced the limitation of Time and space (Access anytime/anywhere)
- Reduce the duplication of work, save the time, money and manpower
- Web based collaborative system
- Ease to learn, understand, use and implement
- Feedback mechanism
- Updated and latest tools and technology for services providing
- No need to learn complexion technology (JAVA, HTML, APACHE and etc)
- Increase the Level of satisfaction
- Transparency in work
- Showcasing of Innovation and talent
- Reduced the Human Interaction between library resources and users
- Sustainable development

6. Conclusion

The new technology if exploited and implemented effectively can bring sea change in the Library & Information Resources Centre, thereby solving many library problem such as quality of services, product, wastage & stagnation, mass failure of users, delinquency and truancy. New technology has immense potential and can herald as a revolution for the world of learning, but it is possible only if those involved in it give themselves the means to do so. This library site plays a key role in providing the maximum services & facilities to users. It helps to fulfill the five Laws of library & Information Science. In present scenario, Library & Information Professional should cultivate their field of knowledge in professional way. They should contribute to the field by research, innovative works & updates with the new technology; we take a small step to fulfill the demand of present era of explosion of information.

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Accessing E-resources through Cloud Computing: *A Proposed Model*

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The main purpose of this paper is to explore how libraries are using Cloud Computing tools into their daily library services and works. Cloud computing is a new breed of service offered over the internet, which has completely changed the way one can use the power of computers irrespective of geographic location. This paper attempts to address a short historic view of cloud computing, the advantages for using cloud computing with libraries, cloud computing activities in the libraries in particular in Digital library in particular. The state of the art of the Pondicherry University and its library are discussed. The proposed cloud computing models for accessing e-contents at Pondicherry University are given for the betterment of the end users in Puducherry UT



Cloud computing, Access to E-resources, Resources sharing, Cloud computing and LIS, Puducherry

1. Introduction

Till recently, and now too many organizations and individuals use computers to work alone, inside a business or home by investing on hardware, software and maintenance. This scenario is slowly changing owing to the emergence of new breed of Internet services popularly known as Web 2.0, through which now one can use the power of computers at a completely different location, what it is popularly called as 'in the cloud' or 'cloud computing'. There are many synonyms for cloud computing such as, 'on-demand computing', 'software as a service', 'information utilities', 'the internet as a platform', and others[1]. Cloud computing refers to use of web for computing needs which could include using software applications, storing data, accessing computing power, or using a platform to build applications .

The best live example of this is Gmail, which is increasingly used by organizations and individuals to run their e-mail services. Google Apps being free for educational institutions is widely used for running different applications, especially the email services, which was earlier run using their own computer servers. This has saved cost for the organizations as they pay peruse for applications and services and time for the computer staff, which they can invest on running other services and need not worry about upgrading, backup, compatibility, and maintenance of servers, which is taken care of by Google.

Libraries are using computers for running services such as Integrated Library Management Software (ILMS),website or portal, digital library or institutional repository, etc. These are either maintained by parent organization's computer staff or library staff. It involves investment on hardware, software, and staff to maintain these services and undertake backup and upgrade as and when new version of the software gets released. Library professionals in most cases not being trained in maintaining servers find it difficult to undertake some of these activities without the support of IT staff from within or outside the organization.

Now cloud computing has become a new buzzword in the field of libraries, which is blessing in disguise to run different ICT services without much of a problem as third-party services will manage servers and undertake upgrades and take backup of data. Even though there are some concerns in using cloud services such as privacy, security, etc., some of the libraries have already embraced this new technology to run some of their services.

2. Cloud Computing Model

Cloud computing is a new technology model for IT services which many organizations and individuals are adopting. It allows them to avoid locally hosting and operating multiple servers over an organization's network and constantly dealing with hardware failure, software installation, upgrades, backup and compatibility issues and also enables them to save cost. In other words, it refers to "the delivery of

computing as a service rather than a product, whereby shared resources, software, and information are provided to computers and other devices as a metered service over a network, typically theinternet".2 In this model rather than investing on hardware and software, organizations buy and pay for the services as needed basis. Cloud computing also helps to increase the IT requirements quickly and easily to accommodate the changes in demand. In other words, it enables organizations to add or remove hardware/software as per the needs just by requesting the service provider to do so.

The Christy & Carina of Gartner Group define cloud computing as 'a style of computing in which massively scalable and elastic IT-enabled capabilities are delivered as a service to external customers using Internet technologies'. To simplify the concept, cloud computing can be defined as 'simply the sharing and use of applications and resources of a network environment to get work done without concern about ownership and management of the network's resources and applications'.

Cloud computing seems to offer some incredible benefits for communicators: the availability of an incredible array of software applications, access to lightning-quick processing power, unlimited storage, and the ability to easily share and process information. All of this is available through your browser any time you can access the Internet. It means computing ability also can be a kind of commodity, as gas, water and electric, easy to use and cheap cost. "Could Computing" brings such a change - "computer storage computing center" are set up by professional network companies such as Google and IBM, through one cable and user can access easily with browser, make "Could" as the center of material storage and application services.

3. Cloud Computing Applications in Libraries

Libraries are using cloud computing in number of areas starting from federated search, website hosting, digital libraries, library Automation, Digital Library Services, Office Applications, Storage, Search Services and Website Hosting etc.

Some of the libraries had initiatives of Cloud Computing undertaken by giants, there is sizable number of initiatives relevant to libraries initiated by organizations and business houses, which are in the business of integrated library software, digital libraries, search engines, etc. Few major ones are;

- **OCLC's Web scale: OCLC** has set an example for making use of cloud computing for libraries. Years together OCLC has been functioning as a cloud computing vendor because they provide cataloguing tools over the internet and allow member institutions to draw on their centralized data store.
- **Ex-Libris Cloud:** Ex-Libris a leading library software vendor from USA, who initially developed most of the current products as locally implemented solutions and at a later stage, adapted them to a hosted environment.
- **Dura space's DuraCloud:** Dura space provides open source repository solutions by undertaking turnkey projects for organisations and libraries to enable them to share scholarly literature using D Space and Fedora Commons.
- **OSS Labs:** OSS labs from India is using Amazon's elastic cloud computing platform owing to the various capabilities of Amazon such as high durability of data, strong information security based on ISO standards, capability, and flexibility.

4. Sharing of E-resources using Clouds

Cloud computing offers information retrieval systems, particularly digital libraries and search engines, a wide variety of options for growth and reduction of maintenance needs and encourages efficient resource use. These features are particularly attractive for digital libraries, repositories, and search engines. The dynamic and elastic provisioning features of a cloud infrastructure allow rapid growth in collection size and support a larger user base, while reducing management issues.

The Digital Library has brought new opportunities for the advancement of digital library. Cloud computing can take the library facility at the most convenient state to its stakeholders than other technical approaches. Many people are getting more used to with the e-copies of books, journals, newspaper and other resources than paperback format. Cloud computing can provide the optimum library services to the people by

centralizing the resources and disk spaces of any digital library. Cloud computing can provide an uninterrupted service to its stakeholders. The implementation of cloud computing in digital library can provide many scopes for people from different professions. Librarians, Computer experts, and people from other professions have different scopes while cloud computing has integrated as part of any digital library.

The three typical kinds of cloud computing services are processing clouds, storage clouds and application clouds. Processing Clouds that provide scalable and mostly affordable computing resources that run enterprise programs, which is also sometimes known as Infrastructure as a service (IaaS), Storage Clouds that offer an alternative to local file systems also known as a Platform as a Service (PaaS), and Application Clouds also called Software as a Service (SaaS), that allow a thin client to interact with services that are completely hosted on an external infrastructure. The libraries can use cloud computing applications to create personalized portals for users, the Library could use cloud computing as their back up methodology. Libraries have already begun to adopt cloud services to alleviate their IT departments and increase efficiency.

5. Objectives of the paper

The objective of this paper is to provide a model of sharing e-resources available in Pondicherry University among its affiliated institutions in different regions of Puducherry UT are using cloud computing and also made available the e-resources to its centers distributed in Karaikal, Mahe and Port Blair (Andaman Nicobar Islands) regions.

6. Cloud Computing model for Digital Libraries

Figure 1 shows the motivation behind to propose a Reference Architecture to Digital Library using Cloud Computing. Here the concept is to decentralize the resources over Internet. Various servers like Digital Library Web Portal Server (DLWPS), Identity server; Notification Server, Query Server, Cache Server, Remote Connection Establishment (VPN) Server, etc. are connected to the cloud or Internet.

Cloud computing can take the library facility at the most convenient state to its stakeholders than other technical approaches. Many people are getting more used to with the e-copies of books, journals, newspaper and other resources than paperback format. Cloud computing can provide the optimum library services to the people by centralizing the resources and disk spaces of any digital library. This concept will open more doors and windows, which will let many people get their access to the library. Cloud computing can provide an uninterrupted service to its stakeholders. This revolutionary concept can save time for all the stakeholders by providing the efficient library services. The social impact of cloud computing on digital library is also noticeable. Research and development regarding any issue will accelerate as people can get easy, efficient, faster and reliable services through cloud computing based digital library. A general cloud computing architecture which can be deployed in federated Digital Library is illustrated in Figure 1

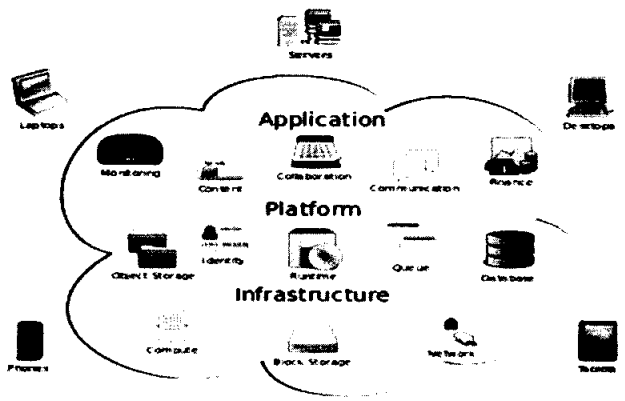


Figure 1: Cloud Computing Architecture

7. Problem Statement

The architecture concept refers to the Digital Library System (DLS) entity and represents a mapping of the functionality and content offered by a Digital Library on to hardware and software components. As Cloud Computing has become more and more popular, various Cloud Computing architectures have been defined for Digital Library Applications. However, to effectively achieve the potential of cloud computing, there is need for the definition of system architecture of the Digital Library systems involved in the delivery of cloud computing, so that it can be used as a reference for the architects [Jing Liu, et.al. (2012)].

Figure 2 shows the motivation behind to propose a Reference Architecture to Digital Library using Cloud Computing. Here the concept is to decentralize the resources over Internet. Various servers like Digital Library Web Portal Server (DLWPS), Identity server, Notification Server, Query Server, Cache Server, Remote Connection Establishment (VPN) Server, etc. are connected to the cloud or Internet.

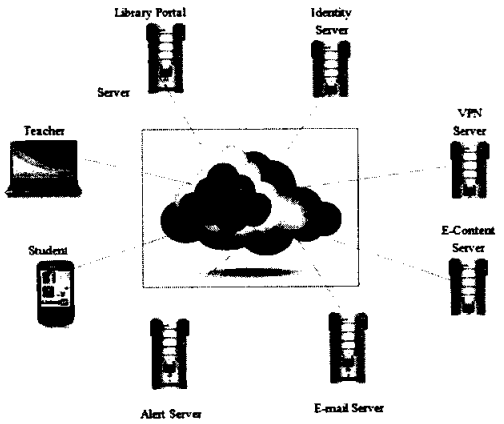


Figure 2: Motivation of Example of Digital Library

Reference model, reference architecture and concrete architecture are the elements constituting the Digital Library framework more specifically. There is no reference architecture available to design Digital Library Systems with scalability. Hence, the problem statement is to have one reference architecture for DLSs supporting DLs constructed by federating local resources and multiple organizations, and another one for personal DLs or for specialized applications.

8. Solution to the Problem

The Solution to the problem is to provide a scalable reference architecture for DLSs using Cloud Computing is called Cloud computing Digital Library System is layered architecture and it consists of demand layer, supply layer and delivery layers. This architecture provides several benefits because it includes SaaS, PaaS and IaaS. The architecture is designed to support maximum scalability and high service levels through virtualization and an optimized management environment. It enables new levels of scalability while providing a very cost-effective modular solution. Some of the critical design factors [GVB Subramanyam, (2012)] are flexible infrastructure, building services, scalability of users and contents, and caching the data. Here, we take the design considerations based on functionality and they are user performance, security, scaling of library user systems, common infrastructure, collaboration services and load balancing.

9. Web Services

Web Services is one of the most active and widely adopted implementation of SOA. It is based on an interoperable protocol called SOAP (Simple Object Access Protocol) and all communication between the server to client, client to client or server to server and in general application to application, uses the same protocol. Web Services technologies are being continuously standardized to ensure interoperability and

security. Due to this reason, Web Services based SOA work from embedded systems to mainframes, from C to Java programming languages. Web Services make calls to web methods exposed as a service by sending and receiving SOAP messages. Web Services are regularly being considered as one of the most advanced forms of SOA implementation and usually one of the most matured as well.

10. Proposed Cloud Model for Accessing E-resources

Cloud based Digital library, as a most important academic and scientific research base, charges for providing information services for its users. In the past, most libraries insisted that their service is based on their own library resources. So librarians scarcely considered users' demands. But today, digital libraries have changed this viewpoint. And librarians usually need to collect as more information as they can according to users' requirements. Then they will analyze the information and sort out them. Finally, they will provide them for users in some certain technical methods. However, services in digital libraries will increasingly focus on users' demanding in future. And the ultimate goal of digital library is to offer appropriate, comprehensive and multi-level services for its users. With the Cloud Computing to digital library, services of libraries will have a new leap in the near future. Services provided by digital libraries will become more user-centric, more professional and more effective, etc. And we all believe that digital libraries will create more knowledge benefits for our country with the help of Cloud Computing.

Figure 3 shows the proposed model for knowledge and resource sharing using cloud computing. The Remote Login Server (RLS) and Digital Library Application Server are installed, configured and connected via Internet Cloud. DL Application Server (DLAS) hosts and runs applications in a centralized location. The Library users remotely access them via a client-side software or an ordinary web browser and interact by exchanging only mouse and keyboard movements, and the corresponding screen updates, over the network. DL Applications become accessible from anywhere, at any time and with any device; performance is enhanced; and, most importantly, sensitive code and data need never leave the datacenter.

The Pondicherry University and its affiliated institutions are geographically distributed in different locations. They are connected to each other via Internet. The PUARL provides user id and password to each user. The users of affiliated institutions can connect the Pondicherry University, Ananda Rangapillai Library (PU ARL) and they can share the resources.

The students Pondicherry University, Puducherry (PUPC), Pondicherry University Karaikal Centre (PUKC) and Pondicherry University Mahe Centre (PUMC) are connected to Pondicherry University through Internet Cloud. The students and faculty are provided with remote login user id and password facility. They can access the PUARL at any time and they can share resources available in the University library.

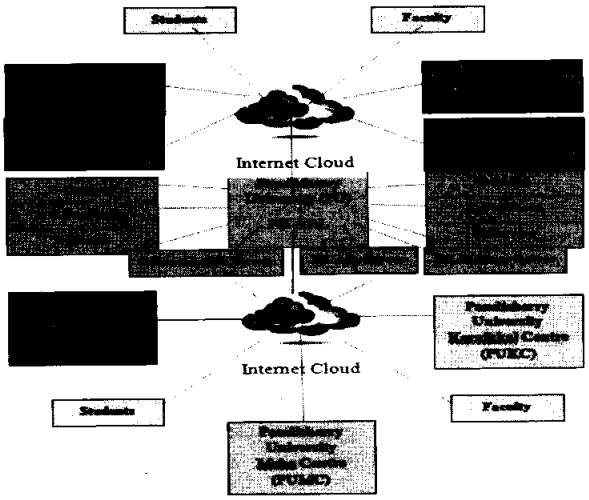


Figure: 3 Proposed Cloud Computing Model for Knowledge Sharing

The different segments of cloud computing in Pondicherry University:

- DL Application Server (DLAS): The DLAS is the part of internet technology which is proved already as the constructive and helpful model. When many individual applications are accessed through the central server of cloud, the PU-ARL will demand severe cost. On the other hand, the DLAS of on-demand are not similar in the price scheme and delivering process to the users.
- DL Storage Server: The backbone of the main concept of Cloud Computing is called infrastructure or storage. It will permit the users to create their own cloud applications within the limited space.
- Connectivity: Most important part of the cloud is connectivity. Without high speed internet connectivity there will be no use of application and storage. Therefore, the high speed leased line internet connectivity is necessary to connect with the cloud.

All above three segments are inter-related with each other and out of three if, anyone is missing then a concept of cloud will remain unfulfilled.

The Benefits of Cloud computing infrastructure are useful to users and service providers. The roll of users is anywhere / anytime access to data and wider access to free software support by advertising. It improved reliability and security of data. It allows dynamic provision of services/resources pools in a co-ordinate fashion and allows no waiting period. The location resources is irrelevant may be relevant from performance data locality.

The roll of Service Providers are lower cost for proof of concept and one off and outsourcing of infrastructure maintenance. It shares infrastructure cost and improve and utilization and peak management. It separates code from physical resources. The Web application fulfill these for end user

The Application of Cloud Computing in Digital Library is given bellow:

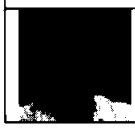
- Hosting library website, backing up media collecting of storage and accessing bibliographic and full text information
- Library must transfer effect into higher value activity and embrace the web as the primary technology infrastructure.
- Understand the importance of personalize of WEBOPAC and understand converged device are everywhere
- Understand that the cloud may also be valuable information resources.

11. Conclusion

Cloud computing is a new baby in the computer systems technology emerged owing to the developments in internet and associated technologies. It is in the evolving stage, requires some amount of careful considerations before organizations think about hosting some of their services. However, this technology has certain advantages, which definitely help organizations such as libraries in managing their services, which will relieve library staff from managing the servers. The cloud computing may help libraries to undertake modern ICT activities without worrying about technical side of it, except adding content of resources. Library professionals many a times find it difficult to manage the technologies owing to their skill levels, lack of support from IT departments or for not having IT facilities within the organizations. This kind of situation always hinders library professionals in undertaking automation of library activities, developing digital library services, etc. Here, cloud computing may help libraries to undertake modern ICT activities without worrying about technical side of it, except adding content of resources It is evident from the literature that some service providers have already pitched in to help libraries to automate and establish digital libraries on the cloud. Hence the proposed Cloud computing model for Pondicherry University for providing for physical and electronic delivery of materials, and integrating the Collection-development process are all affiliated institutions for accessing the e-content available in the Pondicherry University. Cloud computing enables innovation by alleviating the need of innovators to find resources to develop, test, and make their innovations available to the user community. Innovators are free to focus on the innovation rather than the logistics of finding and managing resources that enable the innovation.

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Advancing Storage and Services by QR Code: *A Cost Effective Tool*

Munesh Kumar

Abhishek Kumar

Abstract

Concealing and hiding has been the tendency of human since inception. The reason behind it is to keep things safe and free from others. In this way human created and developed many symbols and code to serve the different purpose, hence; plenty of code and symbols exiting today. Likewise, QR Code came in to animation just to serve the purpose to locate the original things in amongst others similar kinds of things with feature of hidden exact information in it. Later it is adopted by different communities for various purposes. It has spanned its hand in big firms and being used frequently in marketing. By implementing it in to library we can serve the purpose better and make a virtual mobile library easily with cost effective technology of QR Code.

QR Code; Mobile Library; E-resource; Digital Library; Storage technique

1. Introduction

Discovery and technologies are bringing and introducing many changes in society and human life which helped to human in its life to make it more easer and needful. Hence, as the development taken place things are being introduced in society. QR code is one the example of these developments. It is used for storing the information and data for quick access and reference purpose. It is invented in Japan, by an automobile company Denso. Now it is being used in all over the world in all the sectors such as; media, advertisement and marketing, in all the sectors. Library and information center is one the service industry, serve the information better rather than it is purchased directory by learners, information consumers and research scholars. Now the advertisement industries are using the QR Code to establish a strong connection between their customer and its product with a single click instead of giving instruction to trace the product on the web. Means, that QR Code is helping in the following the correct address of a product or address on web. By this ways this tool has removed the problems itself, and has bridged the gap and finished that distance between production/product and its consumer.

In library and information center now the demand of e-documents are increasing fast. Library classification scheme classified the physical document available in library which comes in OPAC, While the machine made resource links are not understandable by human, the chances of mistake is common in coping and not easy to locate the resource in the web. The increasing trend and need of virtual reading materials and electronics materials created challenges in front of the information managers and library science professionals. To fulfill the need of information in the changing technology trend is not easy job. Development of ICT becomes primary factor in publication of research work and knowledge outcome. The origin of the concept Web 2.0 is created an environment of learning and given a freedom and as well a platform to its users to create, publish, and share the knowledge and intellectual property on web like, audio, video, text, images, information, personal views etc. which gradually come in to the mobile community called as Mobile 2.0. It is also called the Reaching mobile users (Robin Ashford, 2010).

2. What is QR Code

QR Code looks as a matrix shaped different colored image or picture, which is used to store or save the data and stored/saved the data can be used for different purpose by decoding it with the help of any smart phones (QR Apps installed), QR reader devices; iPhones / iPods / iPods without any condition on different operating systems like Android, Symbian and others. It is used for the coding of information and decoding of QR Coded information. It has different features and properties to serve better than other conventional codes like barcode and other code.

3. Different from other conventional code

QR Code is different from other conventional code such as barcode etc. Now the day barcode is one of the major and important tools in library and other organizations. Barcode used in libraries for the circulation of documents, stock verification and other input related work. QR Code and bar code both are working on same principle but having different in capacity and strengths. Barcode is old and competent having a strong faith and earliest come in to the picture but QR Code is new one which is emerging the new trends as well with technology in the era of ICT, with many advanced features and qualities. One weakness with the barcode is the capacity to store the data which is a strong point in QR Code.

4. Why to QR Code for information management?

Today's publication trend has been changing in comparison to earlier publication style. In this way it is very difficult to keep remember or to keep known the name of e-resources found on web. Now every e-document is getting a unique identification that is called Digital Object Identifier (DOI), which contains the information of particular document including protocol, name of organization or agency, its domain, and many connecting digits different codes for encryptions symbols or special characters.

5. Why in library and Information Center?

It is not a tuff to justify it because of the merits and advantages of QR Code it easily can be justified by giving some points in this regard. If you follow the Normative Principles of Library Science then many principles are fitting well the merits of QR Code. Some positive points in support to the QR Code are mentioned below:

- **Size**- QR Code can be printed in very small size containing lots of characters and big size data in different colors with different in shape structures. It is able to save more data in compression mode. It takes smaller place to affixes the QR image. Hence, follows the Laws of Parsimony.
- **Cost effective**- Implementation of QR code is very cheaper. It can be easily created by websites and free downloadable software. It also can be created by smart phones and other phones by installing the QR Code app in it.
- **Easy to implement**. – The implementation part of QR Code is very simple and easy to do. Easily, data can be converted in to QR Code form. Either by software or online, it can be downloaded in forms of images in different shapes and sizes.
- **Free** – Although Denso has its patent right on its name but it is opened and free for all for their business, advertisement and resources access and for fare use purpose only.
- **Both side data** - QR Code stores the data in both sides vertical and horizontal. By this way it stores many times more data than other conventional code.
- **High capacity to store the data** – It has very high capacity to store the data of different form as numeric, alphanumeric, and Kanji/Kana (see below table-1)

Table 1 capacity to store the data in QR Code

Input mode	Max. characters	bits/char	possible characters, default encoding
Numeric only	7,089	3⅓	0, 1, 2, 3, 4, 5, 6, 7, 8, 9
Alphanumeric	4,296	5½	0–9, A–Z (upper-case only), space, $, %, *, +, -, . , /, :
Binary/byte	2,953	8	ISO 8859-1
Kanji/kana	1,817	13	Shift JIS X 0208

Character refers to individual values of the input mode/data type (Source: Wikipedia)

- **Customization facility** – QR Code is facilitated with customization facility in different ways such as color, structures, design and size. QR Code can be generated in any color and as per your design and size of your need you may get it in many file formats like .jpg, .png, .gif, .pdf etc.
- **Offline and online readabilities** – QR Code is made for serve the purpose of tracking of the roots of products or manufacturer information of vehicles; it is possible by those scanning devices which have internet connectivity. But it also gives information offline, like phone numbers, website information, vCard, memo numbers, coded SMS, etc. for which internet connection is not required. To scan the QR coded data internet connection is not required it is required to execute the result or data or login on other servers. By scanning of a QR Code if the device is connected with the internet then sudden it will reach at the place of source data.
- **Freedom of reading direction** – QR Code can be read at 360 degree. There is no matter of reading direction. While other codes don't give freedom to read the data in 360 reading. Some codes are having the features of reading at 180 degree.
- **Privacy**- Privacy is nothing but a mental consensus is towards keeping things or information secrete. QR Code provides meet this consensus. Simply information can be coded and sent to specific person without losing the information contains in it.
- **Data resistant** – One of most important features of QR Code is data resistant. If we see its design part then we find that it is made in four layers named as Level L, Level M, Level Q, and Level H which have different data correction capacity or can restore data after its damages. Those four layers are as follows with level of data resistant capacity by table 2:

Table 2: Level of Data Corrections in QR Code in Terms of Percent (Source: Wikipedia)

Level L (Low)	7% of coded words
Level M (Medium)	15% of coded words
Level Q (Quartile)	25% of coded words
Level H (High)	30% of coded words

- **Useful for the backup of data** – QR Code is very much capable to store the data and save it safe for long time. It may be used for the data backup, and it useful to stores the binary data files of big size data. It save data to decode in picture or image later can be decoded to get the data. This technique can be expanded and scope is there in this area. These features can save the lots of space in future.

6. How to get QR Code app

QR Code apps are freely available online. It can be easily downloaded and installed in your handheld devices like: Smart Phone, iPhones, Android Phone, and PC etc. Google based smart apps can download from Google Play or Android Markets is a kind of resource center for the free mobile phone apps.

- **QR Code Software :** The QR Code software is freely available on this internet address of *XRen QR Code 2.10:* (http://www.softpedia.com/get/Others/Miscellaneous/XRen-QRCode.shtml)

7. Build QR Code

QR Code is very simple to create and get it. Numbers of free website are there, from where you can create QR Code and download it in many formats like: .gif, .jpg, .pdf, .png etc. QR Code is free for use for all. It has given some website address here below by tracking this web address you may get QR Code picture for your purpose.

- www.qrcode.kaywa.com/

- www.qrstuff.com/
- www.createqrcode.appspot.com/
- www.qurify.com/
- www.qrcode.littleidiot.be/
- www.beqrious.com/qr-code-generator/

8. Utilization of QR Code

- Through QR Code URLs or URIs of articles form database or free titles on internet can be given for easy to track, such as: newspaper clipping and coding of hot news links.
- It can be used on notice board as for further information or link to source.
- Paste at the stacks to show the list of books as a guide chart or stack guide.
- At the place of new arrivals QR code image can be fixed as remarks of further readings for more information or reviews etc.
- Use on the user's ID card, having the personal data of user as well gateway to more source of information.
- Give at the place of sign board of librarian, a link to reach at librarian's page or social or professional pages or brief bio-data.
- Use it on the books/documents, to describe about the call number, or sources for online reading (if available) and the resources or content page on website or on library website page.
- Display some articles and give the URLs of your user need, user can get those by scanning the given QR Code there. By this user can save time of noting down the big, long size of URLs.
- Create the OPAC Links and tentative list of services and databases that your library subscribes and procuress.
- Bring more users to library to giving library in their handheld gazettes like: mobile, tablets, smart phone etc.
- Not to meet the problems of putting incorrect address of web resource in the browsers.
- To save the time of users, which waste in writing the web URLs or UIDs and use it later as per the need; by this way the chances of error are increased; hence QR Code is a best solution in this regard.
- QR code in to do list for planning of the days, just scan and get the current, updated list of works.
- To locate the new web stuff, that is to be shared in public or in user groups by the help of QR Code.

9. QR Code existing in Libraries

There are some prominent universities which have adopted QR Code in their library as a service tools and to store the data to give the links via, some name of universities have given below with their website address:

- Lawrence University Seeley G. Mudd Library. (www.lawrence.edu/library/)
- Boise State University's Albertsons Library. (www.library.boisestate.edu/)
- Brigham Young University's Harold B. Lee Library. (http://lib.byu.edu/sites/qrcodes/)

- Half Hollow Hills Community Library. (www.hhhlibrary.org/)
- ACU Library (www.library.acu.edu.au/)
- Bath University Library. (www.bath.ac.uk/library/)

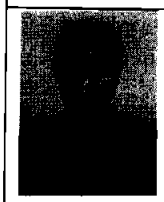
- **Weakness and pitfalls in QR Code implementation:** Although QR Codes, are very convenient and suitable in information sharing and providing link to resource or information source as a channel and gateways to link the source data. But directly or indirectly it has some problems which is playing a major role in not to development of QR code. Some problems as:
- **High rate of Internet connectivity** – In developing nations generally internet connections are very costly it not possible for each student to opt it. This is backwardness in knowledge sharing through this media.
- **High price of devices** – It's features of QR Code that it can be created by a specific device or internet sources but for reading a device should be there to decode the coded data. Smart phone are there which can used for this work. The prices of smart phones are very high; it is not possible for low income nations or developing countries people. But slowly these barriers are being bridged.
- **Poor networks** – In developing countries the connectivity of network is very poor. It could not be implemented properly across the nation. Connectivity this there but the there is no free flow of data or bandwidth, noises are there.
- **Knowledge** – Knowledge of any new system is very important for its implementation. For implementing QR Code in library and information centers. Professional are having good knowledge but still that knowledge is not there by which they can be implement it in to their work.
- **System** – System means not any structured or complicated system. Here, the meaning specify for the old and new system only. It is difficult for old system to adopt this system and change for new system. But for new systems which are in developing stage can adopt frequently.
- **Faith and Psychological barriers** – It is not so popular in information centers and in this community. Hence, it has very less faith from user communities. From advertisement industries and marketing it has good remarks. Some a fear exists in society because of new thing society takes time to adopt it.

10. Conclusion and Recommendations

QR Code is a very novel tool to save the data in encoded form of different types; numeric, alphanumeric, binary and Kanji, a Japan origin language. There are many features of QR Code which is totally different form other codes like barcode. It contains data in both vertical and horizontal. It has data recovery capacity up to 75 % with its features of data division inside. Apart from it is accessible online and offline. The tools and devices to read the QR Code are very common and easily available in economy cost. QR Code is able to cope up with the changing ICT today and also creates a relation between library and end user by giving them access of library resources in their handheld devices. By taking images of QR Code users can save their valuable time in writing the long and big size URLs. QR Code is a standard patent of Denso Wave, inventor but is free for all so Library and Information Center may get good experience and benefits, can provide a better service to their users by giving library oriented information and links to resources in their handheld devices. It has been tried to justify QR Code to choose it. It is being used in industries and advertisement companies, some universities and libraries have started but it should be on large scale. There are online forums to provide help regarding the implementation and using methods. We have provided the over views of QR Code as a channel for sharing the information between machine to machine and user. Options are there with QR Code, just need to explore it.

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Application of Cloud Computing in Libraries: Issues and Challenges

Dr. Narender Kumar **Ashok Kumar**

Abstract

Cloud computing is the next natural step in the evolution of on-demand information technology services and products. The idea of cloud computing is based on a very fundamental principle of 'reusability of ICT capabilities.' Latest technological developments have brought dramatic changes in every field, and library and information science is not exception to it. Librarians are also applying different platforms in library science field for attaining economy in information handling. This paper presents an overview of the basic concept of cloud computing, its characteristics, service models, and deployment of cloud services, application of cloud computing in libraries and how cloud computing actually works is illustrated. This paper explores some of the security issues surrounding data collection, mobility, and availability.

Cloud computing, models of cloud computing, virtualization, SaaS, PaaS, IaaS.

1. Introduction

The 'cloud' is a metaphor for the internet itself. Every time a person uses the internet to search any term on Google or use their web-based email services to send or receive emails, he or she is using a cloud application. A person who uses Facebook or other social networking sites is using a cloud application. In fact, when the Internet was first being developed, file sharing, hosting services and email itself were the first cloud applications. Therefore, every person who has ever surfed the Internet or used Hotmail or Google mail has already used the cloud. Nevertheless, despite the concept of the cloud computing being nothing new, 'cloud computing' is revolutionizing the way in which the world is computing data.

Cloud computing means using the Internet and central remote servers to maintain data and applications instead of maintaining data on individual mainframe computers or PCs. This means that a person could click on the start menu of any computer anywhere access all his files as though he was using his own desktop or laptop computer. As result, a person could work on anyone's computer with the same ease though he was working on his own computer in his own office. The files appear to be loaded on the hard drive of that computer while in fact they are not located on that computer and have been downloaded from the cloud/internet onto that computer. In short, cloud computing refers to the technologies that provide software, data access, storage devices that do not require physical location of the system. The main advantage over the conventional forms of applications is that cloud computing need not depend on a physical structure for its operations (Viswanathan, 2012).

Cloud computing technology is offering great advantages for libraries to connect their services not only promptly but also in new formats with the flexibilities such as pay as you use model, access any where any time and so on. Nowadays libraries are using cloud computing technology for enhancing the services by adding more values, attracting the users and cost effectiveness. In the cloud computing environment, clouds are vast resource pools with on demand resource allocation and a collection of networked features. The new concept of cloud and libraries has generated a new model called cloud libraries. Though the usages of cloud computing may vary with the libraries nature, services and information needs but most common usages of cloud computing with in libraries can be development of digital libraries, corporate cataloging, acquisition, storages and sharing the resources on virtual environment on the web (Kaushik & Kumar, 2013).

2. What is Cloud Computing?

Cloud computing is a computing paradigm, where a large pool of systems are connected in private or public networks, to provide dynamically scalable infrastructure for application, data and file storage. With the

advent of this technology, the cost of computation, application hosting, content storage and delivery is reduced significantly. Cloud computing is a practical approach to experience direct cost benefits and it has the potential to transform a data center from a capital-intensive set up to a variable priced environment. The idea of cloud computing is based on a very fundamental principle of 'reusability of IT capabilities'. The difference that cloud computing brings compared to traditional concepts of 'grid computing', 'distributed computing', 'utility computing', or 'autonomic computing' is to broaden horizons across organizational boundaries.

Forrester defines cloud computing as: "A pool of abstracted, highly scalable, and managed compute infrastructure capable of hosting end-customer applications and billed by consumption.

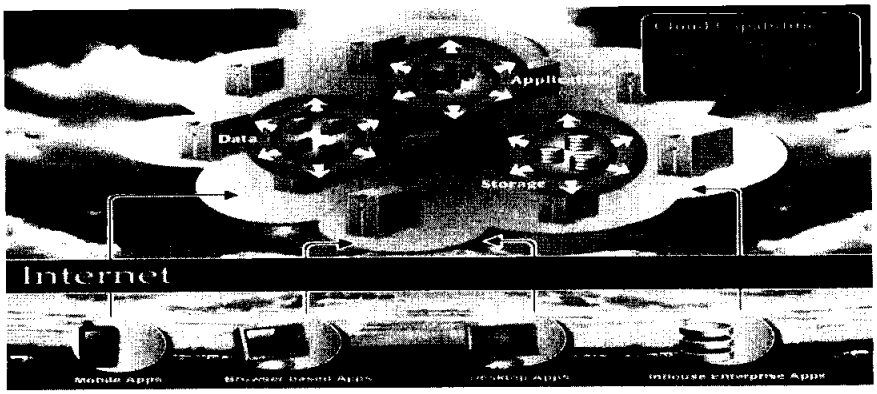


Figure 1: Conceptual view of cloud computing

2.1. Definitions

Nowadays, nearly everybody, every IT company is discussing the cloud. Though there is no precise definition about cloud computing, you can understand it in many ways (What is cloud computing?, n.d.).

Wikipedia (Cloud computing, n.d.) claimed that the concept of cloud computing was emerged back to the 1960s, when John McCarthy opined that computation may someday be organized as a public utility. Chellappa gave the first academic definition of the term Cloud Computing in 1997 and later on, in the year 2007 the term cloud computing came into popularity and firstly was used in this context when Kevin Kelly opined that eventually we will have the inter-cloud, the cloud of clouds.

The following definition of cloud computing has been developed by the U.S. **National Institute of Standards and Technology (NIST)**: Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models. Those models and their relationship to essential characteristics of cloud computing are shown in Figure 2.

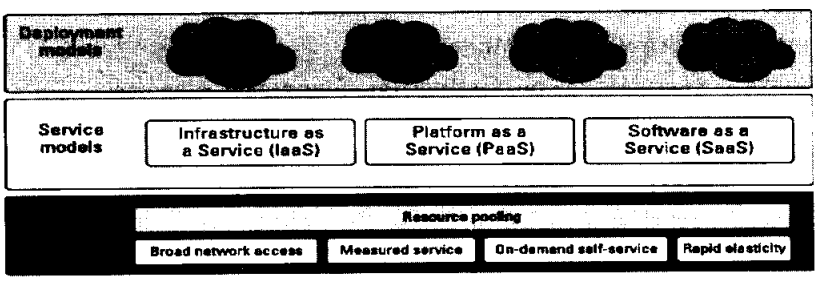


Figure 2: The NIST Cloud Computing Definitions

3. Models of Cloud Computing

3.1. Deployment Models

A deployment model defines the purpose of the cloud and the nature of how the cloud is located. There are many issues to consider when moving an enterprise application to the cloud environment. For example, some service providers are mostly interested in lowering operation cost, while others may prefer high reliability and security. Accordingly, there are different types of clouds, each with its own benefits and drawbacks:

1. Public Cloud: The public cloud infrastructure is available for public use alternatively for a large industry group and is owned by an organization selling cloud services.

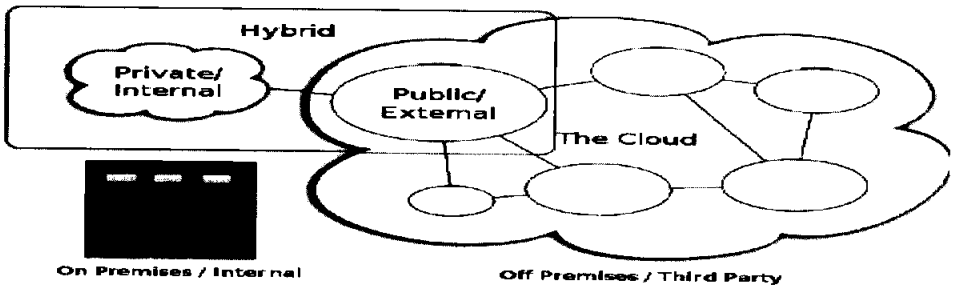


Figure 3: Cloud Computing Types

2. Private Cloud: The private cloud infrastructure is operated for the exclusive use of an organization. The cloud may be managed by that organization or a third party. There are two variations to a private cloud:

2.1. On-premise Private Cloud: On-premise private clouds, also known as internal clouds are hosted within one's own data center. This model provides a more standardized process and protection, but is limited in aspects of size and scalability. IT departments would also need to incur the capital and operational costs for the physical resources. This is best suited for applications which require complete control and configurability of the infrastructure and security.

2.2. Externally hosted Private Cloud: This type of private cloud is hosted externally with a cloud provider, where the provider facilitates an exclusive cloud environment with full guarantee of privacy. This is best suited for enterprises that don't prefer a public cloud due to sharing of physical resources.

3. Hybrid Cloud: A hybrid cloud combines multiple clouds (private, community of public) where those clouds retain their unique identities, but are bound together as a unit. A hybrid cloud may offer standardized or proprietary access to data and applications, as well as application portability.

4. Community Cloud: A community cloud is one where the cloud has been organized to serve a common function or purpose. It may be for one organization or for several organizations, but they share common concerns such as their mission, policies, security, regulatory compliance needs, and so on. A community cloud may be managed by the constituent organization(s) or by a third party.

3.2. Cloud Computing Service- Delivery Models

Cloud computing products and services can be classified into four major categories:

1. Application as Service (AaaS)
2. Platform as a Service (PaaS)
3. Infrastructure as a Service (IaaS)
4. Software as a Service (SaaS)

1. Application as a Service (AaaS): These are the first kind of cloud computing services that came into being. Under this, a service is made available to an end-user. The end-user is asked to create an account with the service provider and start using the application. One of first famous application was web-based email service by hotmail started in 1996. Scores of such services are available now on the web.

2. Platform as a Service (Paas): Here, a layer of software, or development environment is encapsulated and offered as a service, upon which other higher levels of service can be built. The customer has the freedom to build his own applications, which run on the provider's infrastructure. To meet manageability and scalability requirements of the applications, PaaS providers offer a predefined combination of OS and application servers, such as LAMP platform (Linux, Apache, My Sql and PHP), restricted J2EE, Ruby etc. Google's App Engine, Force.com, etc are some of the popular PaaS examples.

3. Infrastructure as a Service (Iaas): IaaS provides basic storage and computing capabilities as standardized services over the network. Servers, storage systems, networking equipment, data centre space etc. are pooled and made available to handle workloads. The customer would typically deploy his own software on the infrastructure. Some common examples are Amazon, GoGrid, 3 Tera, etc.

4. Software as a Service (SaaS): In this model, a complete application is offered to the customer, as a service on demand. A single instance of the service runs on the cloud and multiple end users are serviced. On the customer's side, there is no need for upfront investment in servers or software licenses, while for the provider, the costs are lowered, since only a single application needs to be hosted and maintained. Today SaaS is offered by companies such as Google, Sales force, Microsoft, Zoho, etc. The following figures show the various types of cloud services as four distinct models: Infrastructure as a Service, Platform as a Service, Software as a Service, and Application as a Service.

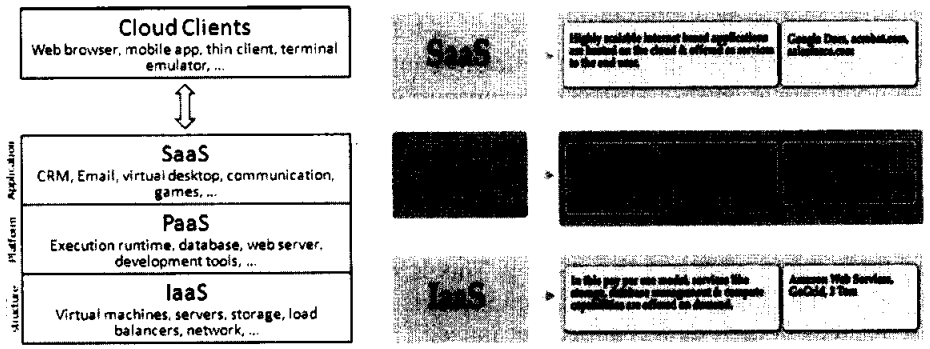


Figure 4: Cloud Computing Service Models

4. Working of Cloud Computing

Cloud computing system can be divided it into two sections: the front end and the back end. They connect to each other through a network, usually the Internet. The front end is the side the computer user, or client, sees. The back end is the "cloud" section of the system. On the back end there are various computers, servers and data storage systems that create the "cloud" of computing services. A central server administers the system, monitoring traffic and client demands to ensure everything runs smoothly. It follows a set of rules called protocols Servers and remote computers do most of the work and store the data.

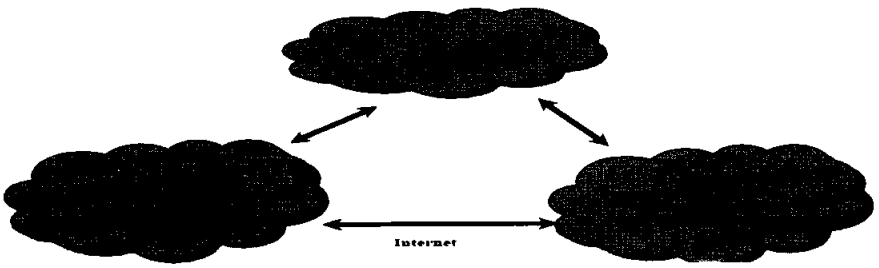


Figure 5: Working of Cloud Computing

5. Characteristics of Cloud Computing

Any cloud is expected to have these characteristics that are being described below:

A. On-demand self-service: A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service's provider.

B. **Broad network access:** Cloud Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, laptops, and personal digital assistants (PDAs)).

C. Resource pooling: The provider's computing resources are pooled to serve multiple consumers using a multiple-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independence in that the subscriber generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or data centre). Examples of resources include storage, processing, memory, network bandwidth, and virtual machines.

D. Rapid elasticity: Capabilities can be rapidly and elastically provisioned, in some cases automatically, to quickly scale out and rapidly released to quickly scale in. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be purchased in any quantity at any time.

E. Measured Service: Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported providing transparency for both the provider and consumer of the utilized service.

F. Multi-tenancy: With cloud computing, any application supports multi-tenancy - that is multiple tenants at the same instant of time. The system allows several customers to share the infrastructure allotted to them without any of them being aware of the sharing. This is done by virtualising the servers on the available machine pool and then allotting the servers to multiple users. This is done in such a way that the privacy of the users or the security of their data is not compromised.

6. Pros and Cons of Cloud Computing

- Customers cannot own the infrastructure they are using, they can only rent it or can pay as they use.
- The major advantage of cloud computing is its less price.
- The companies can invest on lower technology based products and can focus on investing their money on goods and services they specialize.
- Location and device independence can be achieved that enables the users to access systems from any device and any location.
- Cost and resource sharing between the users provides efficient savings like performance, load balancing, and even locations.
- It is reliable and scalable.
- The major concern is data security.
- Improved resource utilization provides green and clean technology.

7. Applications of Cloud Computing in Libraries

In the libraries, the following possible areas were identified where cloud computing services and applications may be applied:

1. Building Digital Library/Repositories: Library is having a digital library that developed by using any digital library software. In connection to cloud based digital library software, Duraspace is having two softwares namely Dspace and Fedora Commons but Dspace is widely used for building digital libraries/ repositories relative to Fedora Commons. Dura cloud provides complete solutions for developing digital libraries/repositories with standard interfaces and open source codes for the both software.

2. Searching Library Data: OCLC is one of the best examples for making use of cloud computing for sharing libraries data for years together. For instance, OCLC World Cat service is one of the popular service for searching library data now is available on the cloud. Web share management system facilitates to develop an open and collaborative platform in which each library can share their resources, services, ideas and problems with the library community on the clouds. On the other hand, the main aim of web- scale services is to provide cloud based platforms, resources and services with cost benefit and effectiveness to share the data and building the broaden collaboration in the community.

3. Website Hosting: Website hosting is one of the earliest adoptions of cloud computing as many organizations including libraries preferred to host their websites on third party service providers rather than hosting and maintaining their own servers. Google Sites serves as an example of a service for hosting websites outside of the library's servers and allowing for multiple editors to access the site from varied locations. Searching Scholarly Content Knimbus is cloud based research platform facilitates to discover and share the scholarly content. Currently, Information and Library Network (INFLIBNET) Centre (http://www.inflibnet.ac.in) has been incorporated Knimbus cloud service into its UGC INFONET Digital Library Consortium in order to search and retrieve scholarly contents attached therein.

4. File Storage: To access any files on the internet, cloud computing present number of services such as Flicker, Dropbox, Jungle Disk, Google Doc, Sky Drive and so on. These services virtually share the files on the web and provide access to anywhere and anytime without any special software and hardware. Therefore, libraries can get advantages of such cloud based services for various purposes. For instance, LOCKSS (Lots of Copies Keeps Stuff Safe), CLOCKSS (Controlled LOCKSS) and Portico tools are extensively used for digital preservation purpose by libraries and other organizations.

5. Building Community Power: Cloud computing technology offers great opportunities for libraries to build networks among the library and information science professionals as well as other interested people including information seekers by using social networking tools. The most famous social networking services viz. Twitter and Facebook which play a key role in building community power. This cooperative effort of libraries will create time saving, efficiencies and wider recognition, cooperative intelligence for better decision making and provides the platform for innovation and sharing the intellectual conversations, ideas and knowledge.

6. Library Automation: For library automation purpose, Polaris provides variant cloud based services such a acquisitions, cataloguing, process system, digital contents and provision for inclusion of cutting edge technologies used in libraries and also supports various standards such as MARC21, XML, Z39.50, Unicode and so on which directly related to library and information science area. Apart from this, nowadays many of the software vendors such as Ex-Libris, OSS Labs are also offering this service on the cloud and third party services offering hosting of this service (SaaS approach) on the cloud to save libraries from investing in hardware for this purpose.

Besides cost-benefit, the libraries will be free from taking maintenance viz. software updates, backup and so on.

8. Examples of Cloud Libraries

- OCLC
- Library of Congress (LC)
- Ex-libris
- Polaris
- Scribd
- Discovery Service
- Google Docs / Google Scholar
- Worldcat
- Encore

9. Advantages of Cloud Computing in Libraries

- Cost saving
- Flexibility and innovation
- User centric
- Openness
- Transparency
- Interoperability
- Representation
- Availability anytime anywhere
- Connect and Converse
- Create and collaborat

10. Present Situation of Indian Libraries

In India, cloud computing in libraries is in development phases. Libraries are trying to provide to users cloud based services but in real sense they are not fully successful owing to the lack of good service providers and technical skills of LIS professionals in the field of library management using advanced technology. But some services such as digital libraries, web documentation and using web 2.0 technologies are running on successful modes. Some good examples of successful cloud computing libraries include Dura cloud, OCLC services and Google based cloud services. Nowadays many commercial as well as open sources venders (i.e. OSS) are clubbing the cloud computing technology into their services and products. However, cloud computing technology is not fully accepted in the Indian libraries but they are trying to develop themselves in this area.

11. Cloud Computing: Issues and Challenges

Despite its growing influence, concerns regarding cloud computing still remain. In our opinion, the benefits outweigh the drawbacks and the model is worth exploring. Some common challenges are:

1. Data Protection: Data Security is a crucial element that warrants scrutiny. Enterprises are reluctant to buy an assurance of business data security from vendors. They fear losing data to competition and the data confidentiality of consumers. In many instances, the actual storage location is not disclosed, adding onto the security concerns of enterprises. In the existing models, firewalls across data centers (owned by enterprises) protect this sensitive information. In the cloud model, Service providers are responsible for maintaining data security an enterprise would have to rely on them.

2. Data Recovery and Availability: All business applications have Service level agreements that are stringently followed. Operational teams play a key role in management of service level agreements and runtime governance of applications. In production environments, operational teams Support Appropriate clustering and Fail over Data Replication System monitoring (Transactions monitoring, logs monitoring and others) Maintenance (Runtime Governance) Disaster recovery Capacity and performance management If, any of the above mentioned services is under-served by a cloud provider, the damage and impact could be severe.

3. Management Capabilities: Despite there being multiple cloud providers, the management of platform and infrastructure is still in its infancy. Features like: Auto scaling, for example, is a crucial requirement for many enterprises. There is huge potential to improve on the scalability and load balancing features provided today.

4. Regulatory and Compliance Restrictions: In some of the European countries, Government regulations do not allow customers personal information and other sensitive information to be physically located outside the state or country. In order to meet such requirements, cloud providers need to setup a data center or a storage site exclusively within the country to comply with regulations. Having such an infrastructure may not always be feasible and is a big challenge for cloud providers. With cloud computing, the action moves to the interface that is, to the interface between service suppliers and multiple groups of service consumers. Cloud services will demand expertise in distributed services, procurement, risk assessment and service negotiation areas that many enterprises are only modestly equipped to handle.

5. Performance: Cloud computing suffers from severe performance issues. The cloud provider must ensure that the performance of the service being provided remains the same all through. There may be peak time break downs, internal flaws, and technical snags arising. Load balancer, data replicators, high end servers must be installed when needed.

6. Cost: Cloud computing can have high costs due to its requirements for both an "always on" connection, as well as using large amounts of data back in-house.

7. Bandwidth, quality of service and data limits: Cloud computing requires 'broadband of considerable speed' whilst many websites are usable on non-broadband connections or slow broadband connections; cloud-based applications are often not usable. Connection speed in Kilobyte per second (or MB/s and GB/s) is important for use of cloud computing services. Also important are Quality of Service (QoS); indicators for which include the amount of time the connections are dropped, response time (ping), and the extent of the delays in the processing of network data (latency) and loss of data (packet loss).

8. Major suppliers: Only handful providers are available in the market which is still holding back many SME's to join a cloud.

11.1. Legal Issues

Cloud computing raises a number of legal issues. Since cloud computing involves storing and processing of huge amount of information in the cloud, it raises complex issues of data security and privacy particularly in a public cloud as the data of various companies are all stored together in the same cloud. It is important for the service providers to provide the customers with encryption codes to protect the information on the cloud. Data portability between service providers is another major issue.

Second, cloud computing raises serious issues regarding cyber crime and hacking because a cloud environment is not a traditional secure network. Instead, it is an environment in which any user/subscriber can gain access and use. This means a hacker may pose as user in order to introduce bots or other malware into the cloud.

Third, cloud computing raises issue concerning protection of intellectual property rights. The threshold question is who owns the data stored in the cloud? The immediate response is that the IPR in the work stored on the cloud would be owned by the subscriber. However, in cloud, information is constantly being added, removed or modified and new information created. Therefore, it is important to specify that the subscriber owns all the IPR in the compilation of information created in the cloud.

Cloud computing also raises complex issues regarding jurisdiction. A key element determining jurisdiction is physical location. The general norm includes a house computing centre allowing the enterprise to know where the data is located and the methods of securing the data on the cloud. However, sometimes the service providers do not disclose the location of the data. Issues arise when the data flows to another jurisdiction. Often, even the providers of cloud computing services do not know exactly where the data is located. The data may be located in several countries which gives rise to vexed questions relating to jurisdiction.

11.2. Data Security and Privacy

Issues regarding data security and privacy in the context of cloud computing has been addressed primarily in the US and Europe:

The US National Institute of Standards and Technology (NIST), under the Federal Information Security management Act (FISMA) of 2002 has framed guidelines addressing various data security and privacy challenges arising in public cloud environments and corresponding safeguards. Several procedures have been evolved in the US in order to enhance data security on a cloud. The first is 'data sanitization' which involves the removal of sensitive information in the cloud when the storage is shifted to another place. If the data one subscriber is mixed with data of another subscriber, the information on the cloud will be effectively lost. Another procedure is 'data isolation' which is intended to ensure that the data of one tenant/subscriber on a cloud is not confused with the data of another subscriber. The third procedure is

'classification of data' which is intended to distinguish between sensitive and non-sensitive information. Users are required to divide the data between these two categories as well as between 'sensitive,' 'confidential' and 'secret information.'

In Europe, data controllers and data processors, as defined in the European Data Protection Directive, are responsible to protect the information on the cloud. Data controllers and data processors are required to be in compliance with data protection laws in order to effectively organize the information on the cloud. It should be distinguished whether the data processor or the data controller is providing the services which will help in determining the respective liabilities of the parties for compliance issues. Under the European Data Protection Directive, subscribers to cloud computing services have the fundamental right to access, block, rectify or delete their data. While subscribers are required to have easy access to the data, sometimes easy access to information is not provided to the users due to lacuna in the service agreement (Viswanathan, 2012).

12. Conclusion

In today's inter institutional and globalised world cloud computing has found its relevance as it provides smooth and transparent operations. The academic libraries can be connected without investing much on the infrastructure and also all the state and central universities can be connected. Cloud computing is a paradigm shift in the Internet age and is revolutionizing how technology is delivered. However, the advantages in terms of costs, flexibility and availability enjoyed by the users of cloud services also bring with them new challenges against cyber crime, data security, protection of intellectual property and jurisdictional issues. Indian legislators and courts have yet to react to the new phenomenon of cloud computing, therefore, this is a space to watch in the near future. Therefore, it time for LIS professionals think seriously before clubbing library services with cloud based technologies and provide reliable and rapid services to their users.

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Application of RFID in Libraries

Garima Verma



Radio Frequency Identification (RFID) is one of the most exciting technologies that revolutionize the working practices by increasing efficiencies, and improving profitability. The article provides details about RFID, its components, how it works, and its usage in libraries. The article also presents RFID in Libraries with implementation preparation and advantages and disadvantages of RFID Technology.



RFID, RFID Tags, RFID Libraries, RFID Implementation

1. Introduction

"Radio Frequency Identification" (RFID) is a technology used for tracking and identification of objects in many areas of commerce, shipping, manufacturing, and, beginning in the late 1990's, in the circulation, inventory and security processes of libraries. It is an ADC (Automated Data Collection) technology that uses radiofrequency waves to transfer data between a reader and a movable item to identify, categorize, and track. It is fast and does not require physical sight or contact between reader/scanner and the tagged item. It is performs the operation using low cost components. This technology attempts to provide unique identification and backend integration that allows for wide range of applications. Some other ADC (Automated Data Collection) technologies are Bar codes & OCR.

2. From Identification to RFID

Electronic identification is divided into two parts:

- 'Contact' identification
- 'Contactless' identification
- **Contact identification:** Contact identification refers to systems with communication ensured by electric contacts. The two main examples of contact identification are:
- **Memory:** Includes embedded memory functions on modules with different forms and sizes.
- **Smart cards:** The most famous smart cards are credit cards, SIM Card or social security card.
- **Contactless identification:** Contactless identifications can be into three parts:
- **Line of sight** - this kind of link requires a direct vision between the identifier and the reader (laser, CCD Camera etc.) The most famous technology is linear bar code and 2D codes (PDF417, QR Code, etc.). The OCR (Optical Character Recognition) is also widely used (scan MRZ (Machine Readable Zone) on passports or National Identity Card).
    - **Infrared link** - this kind of link allows a high rate of data, a high directivity and a great range. These systems also require direct visibility.
    - **Radio-frequency links** - this kind of link enables communication between the identifier and an interrogator, without requiring direct visibility. It is also possible to control the simultaneous presence of various identifiers.

3. Features of RFID

- Enabling RFID for tracking objects is its capability to provide unique identification.
- One possible approach to item identification is the EPC (Electronic Product Code)

- Providing a standardized number in the EPC global Network, with an Object Name Service (ONS).
- Providing the adequate Internet addresses to access or update instance-specific data

4. **Components of RFID** - Main parts of RFID system are-

RFID Tags – Two types of RFID Tags are –

Passive Tags

- Do not require power
- Draws from Interrogator Field
- Lower storage capacities (few bits to 1 KB)
- Shorter read ranges (4 inches to 15 feet)
- Usually Write Once Read Many/Read Only tags

Active Tags

- Battery powered
- Higher storage capacities (512 KB)
- Longer read range (300 feet)
- Typically can be rewritten by RF Interrogators

- **RFID tag memory**
  - Read only tags
    - Tag ID is assigned at the factory during manufacturing
    - Can never be changed
    - No additional data can be assigned to the tag
  - Write once, read many (WORM) tags
    - Data written once, e.g., during packing or at the time of manufacturing
    - Tag is locked once data is written
    - Similar to a compact disc or DVD
  - Read/Write
    - Tag data can be changed over time
    - Part or all of the data section can be locked

Tags can be attached to almost anything Items, books, cases or pallets of products, high value goods, vehicles, assets, livestock or personnel.

- **Antenna** - Also known as sensors, interrogators or readers. A conduit between RFID tags and the coupler. RFID antennas connected to the reader, emit power and data from and to the RFID tags.
- **Reader/ Coupler** - Link between RFID tags and the Server/ PC. The coupler can send information in two directions: It can read information from a tag and send it to the Server/ PC (read mode), or it can read information from the Server and send it to an RFID tag (write mode).

RFID systems can be classified by the type of tag and reader.

- A **Passive Reader Active Tag (PRAT)** system has a passive reader which only receives radio signals from active tags (battery operated, transmit only). The reception range of a PRAT system reader can be adjusted from 1–2,000 feet (0.30–610 m), allowing flexibility in applications such as asset protection and supervision.
- An **Active Reader Passive Tag (ARPT)** system has an active reader, which transmits interrogator signals and also receives authentication replies from passive tags.
- An **Active Reader Active Tag (ARAT)** system uses active tags awoken with an interrogator signal from the active reader. A variation of this system could also use a Battery-Assisted Passive (BAP) tag which acts like a passive tag but has a small battery to power the tag's return reporting signal.
- **Server/ PC**- Link between the coupler and library automation system. The Server/ PC is the heart of a comprehensive RFID system. It is the communications gateway among the various components. It receives the information from the antenna and exchanges information with the circulation database. The server typically includes a transaction database so that reports can be produced.
- RFID Label Printer
- Handheld Reader
- External Book Return
- RFID label Printer

5. Use of RFID in libraries

RFID is the new technology that revolutionizes library management and practices. Following are the various applications of RFID in libraries:

- **Inventory:** RFID has a significant impact on inventory processes in libraries. With a fully-tagged collection, inventory can be taken with a portable, hand-held wand which is passed alongside the books on the shelves; the reader picks up the individual signals from each item's tag, without needing to remove or even tip the books outward from the shelves. Inventory with RFID has also proven to be extremely useful and cost-effective in terms of locating lost or miss shelved items.
- **Server with RFID:** The circulation in the library is carried out with the help of RFID system which enables the users to borrow and return books in an easy and quick manner.
- **Checkout:** RFID technology's ability to read ID tags regardless of position or orientation, as well as detect signals through physical materials, is particularly advantageous for library circulation processes. Since several items can be read at once, checkout procedures can be accomplished much more rapidly than with barcode technology, which requires that each item be handled individually. For these reasons, users can accomplish self-checkout much more efficiently, as well. Implementation of RFID in libraries generally leads to greatly-reduced queues at the checkout counter, enhanced user service, and less repetitive strain injuries for library staff.
- **Checkin:** RFID can be equally advantageous for checkin processes. In addition to being able to check in multiple items simultaneously, RFID readers can be affixed to book return slots, effectively checking in items as they pass through the slot. RFID can further streamline checkin when used in conjunction with an automated materials handling (AMH) system. A conveyor carries items past an RFID reader, which checks them in and then sorts them by category into bins or onto carts, eliminating the need for staff to handle items until the fine-sorting step of the process.
- **Security:** Item security is another area in which RFID technology can benefit a library. RFID tags can be enabled with a theft-detection bit that is deactivated upon proper checkout, allowing the materials to which they have been affixed to pass freely through an RFID-powered security gate. As the items

pass an RFID reader upon being checked back in, the security bits are reactivated. The library monitors in disciplinary transportation of the books with aid of anti - theft detector system and security personnel.

6. RFID implementation in libraries

The following key points should be considered before implementation of a RFID system in a library-

- A privacy policy should be developed, that will encompass implementation of RFID.
- Library users have a right to know that items contain RFID tags and generally where readers are located, technical specifications of those devices.
- The library must make public its policies and practices involving the use and maintenance of RFID systems, encompassing tags, readers, and the associated database(s).
- Library users must be given notice of the purposes for which tags and readers are used.
- There must be auditable security and integrity in transmission, databases, and system access, including the use of encryption.
- The library must inform its users who they can contact for questions and complaints.
- If a library selects an RFID-based system, it is likely to retain that system for a long time, primarily because of its high cost as well as the time-consuming structural changes that the library must engage in to successfully use the new system.
- A performance criterion should be formulated.

6.1. Steps for implementation of RFID in libraries

- Prepare building for Self-Return Book Drop.
- Installation of Self-Return Book Drop.
- Installation of Security Gates.
- Installation of RFID antennas at circulation desk(s).
- Setup of technical services area for implementation of RFID.
- Acquire smart labels and affix them to books.
- Program tags at technical services area.
- Installation of Self-Checkout workstation.
- Train library staff.

6.2. RFID in Libraries

- A new technology with tremendous potential for multiple applications in the future.
- A flexible technology, which combines security and item identification in a single tag and reduces library losses by providing effective library detection systems.
- RFID designed to work efficiently with a materials sorting system, which will automate the check-in and check-out processes.
- RFID eliminates the applied labor of manual material checkout and return processes.

- The self-check machines are extremely user-friendly. Multiple items can be checked out at the same time by simply passing the materials over the scanner.
- There is no need to align or position materials for checkout and all materials (books and non print materials) are checked out the same way.
- Best of all, combining RFID technology at the circulation desk, self-check machines and eventually the materials sorting system will free circulation staff to perform direct user information services (both in person and by telephone) rather than performing repetitive circulation transactions.
- Improves user service & staff productivity.
- Provide efficiency to collection management.
- Provide wireless inventory management.
- Eliminate many sources of repetitive jobs.
- It gives better availability of books as the library database is updated in real time.
- Inventory is 20 time faster than with barcodes.
- Free librarians to focus on doing what they do best—assisting users.

6.3. Advantages of RFID Technology

RFID usually has fewer limitations and more advantages than other technologies.

- No need for the RFID reader to have a clear view of the tag
- RFID labels or tags can read in any orientation
- Another of the RFID benefits is there's no optics to line up and clean
- Tags can be embedded inside items during manufacture
- Reader and tag don't have to be close
- Fast - Read or write to many RFID labels or tags at the same time
- Wireless RFID inventory tracking
- RFID readers aren't as fussy as barcode readers to install
- A radio frequency wireless link works when things are moving.
- Record the IDs of tagged items passing through a gate.

6.4. Disadvantages of RFID Technology

- RFID systems are often more expensive than barcode systems
- Passive tags are relatively inexpensive to active tags
- Active tags are more expensive because they are more complex
- The read range of a passive tag is similar to that of a barcode
- When pricing an RFID system, consider costs over the system lifetime
- Use active tags that are reusable, depending on the type may be able to remove, relocate and reprogram them. This is a practical way of overcoming one of the major disadvantage of RFID.

7. Conclusion

Today, many libraries are moving to RFID technology for it has proven to bring convenience and efficiency in item management through the automation of workflow processes. It has also proven to significantly improve user service. User satisfaction has become crucial for librarians. RFID in libraries, just part of RFID in a larger scheme. Library community should conduct a comprehensive technology assessment of RFID as soon as possible to enable librarians to make the best possible decisions involving the implementation of this technology. The library community is a leader in protecting intellectual freedom and user privacy. Libraries have an opportunity to be societal leaders and a "model industry" in the way in which they adopt RFID-based circulation and ILS systems. What we need to do is to be responsive and strong about saying we want to use this technology, so make it possible for us to do that. The RFID tags in libraries offer the possibility of great increases in productivity and hold a promise of better service for the users. RFID is increasing in popularity among libraries, as the early adopters of this technology have shown that, it makes good economic sense, for libraries.

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Assistive Softwares for Differently Able Library Users: *A Brief Study*

Akhil Mitra

Five Laws of Library Science & all other theories and principles of Library & Information Science always focus on the "User", but generally in normal terms. The brief overview of special assistance softwares available for disabled or more appropriately for Differently-Able is a supplementary as well as complementary note on this issue which is not been an area of first priority focus.

Optacon, Kurzweil, Duxberry Translator, MAGic, JAWS

1. Introduction

The Constitution of India ensures justice, equality, liberty and fraternity and assures dignity of the individual and quality of status and opportunities to all its citizens including *differently-able* persons. It also ensures the fundamental rights to equality, non-discrimination, freedom of speech and expression and the right to life and liberty to all. Government of India has announced plan to make education *disabled-friendly* by 2020. In the electronics age, Information & Communication Technologies (ICTs) are used in all areas of life such as education, health, employment, entertainment, banking etc. Electronics & ICTs can mitigate the barriers faced by *differently able* persons as well as help them to participate independently in day-to-day life.

It is imperative to ensure that Electronics & ICTs are accessible to *differently able* so that they act as an enabler for providing equal opportunities to the differently baled. The National Policy on Electronic Accessibility recognizes the need to eliminate discrimination on the basis of disabilities and to facilitate equal access to Electronics & ICTs. The National Policy also recognizes the diversity of differently baled persons and provides for their specific needs.

2. Objective of Study

This study is aimed to web survey of special softwares available for making accessibility easier for differently able persons who are obviously a potential user of libraries & information centers. It also highlights the vision of Constitution as well as Govt. of India towards education of differently able children who are the future *library users.*

3. Scope of Study

The scope of this study is limited to brief overview of special assistance softwares available for disabled or more appropriately for differently baled library users. The data presented is outcome of internet & web survey.

4. Optacon

OPtical to TActile CONverter is an electromechanical device that enables blind people to read printed material that has not been transcribed into Braille. The Optacon was first marketed in 1970 by Telesensory Systems Inc. of Mountain View, California, USA. It was the brain child of John Linvill, chair of the Electrical Engineering Department at Stanford University, and it was developed with researchers at Stanford Research Institute (now SRI, Inc.).

The Optacon consists of a main electronics unit about the size of a portable tape recorder connected by a thin cable to a camera module about the size of a penknife (See Fig. 1).



Fig. 1 Optacon

The main electronics unit contains a "tactile array" onto which the blind person places his/her index finger. The Optacon user moves the camera module across a line of print, and an image of an area about the size of a letterspace is transmitted via the connecting cable to the main electronics unit.

The tactile array in the main electronics unit contains a 24-by-6 matrix of tiny metal rods, each of which can be independently vibrated by a piezoelectric reed connected to it. Rods are vibrated that correspond to black parts of the image, thus forming a tactile image of the letter being viewed by the camera module. As the user moves the lens module along the print line, tactile images of print letters are felt moving across the array of rods under the user's finger. The Optacon includes a knob to adjust the intensity at which the tactile array rods vibrate, a knob to set the image threshold between white and black needed to turn on the vibration of the rods in the tactile array, and a switch that determines whether images will be interpreted as dark print on a light background or as light print on a dark background.

5. Kurzweil

Kurzweil is comprehensive, integrated literacy software that supports struggling readers in the classroom as well as at home, in the office or work place. Accessing Kurzweil at home complements class instruction and extends learning beyond the walls of the classroom to ensure individual success for a lifetime.

Features of Kurzweil

- Provides access to text in multiple formats such as DOC, TXT, RTF, PDF, etc.
- Talking word processor
- Reads text by word, phrase or sentence (speed is customizable)
- Translation Support for English Language Learners.
- Multiple dictionary options
- Reads the Internet & Talking spellchecker
- Highlighting and notetaking tools

6. Duxbury Braille Translator

The Duxbury Braille Translator is used by virtually all of the world's leading Braille publishers. No one supports more languages than Duxbury Systems. DBT supports grade I & grade II translation in English, Spanish, French, German, Portuguese, Arabic, Malaysian, Swedish, and other languages. DBT can produce contracted and uncontracted Braille, mathematics, and technical Braille. DBT is simple to use & beginners

learn in just minutes. Yet its depth, power and accuracy are such that it is used by most of the major braille production centers throughout the world.

Features of DBT:

- Built-in interline printing to have ink-braille and print together. This makes an easy proofing and teaching tool.
- Math/Science Code and Computer Braille translation for American, UEB, British, and French Braille.
- The ability to include tactile graphics files for mixed text-and-graphic documents
- The current translation table menu includes over 130 different languages plus variations, including contracted braille for most jurisdictions where contracted braille is customarily used.
- Duxbury DBT 11.2 contains braille support for the languages of India.
- Duxbury DBT can import Microsoft Word 2007/2010/2013 files, as well as Open Office files.
- DBT allows languages other than the principal language to be embedded in the same file and treated as appropriate for the context.
- Bidirectional (print-to-braille and braille-to-print) translation for most languages.
- Accurate presentation of both print or braille in either WYSIWYG (what-you-see-is-what-you-get) or coded (how-you-get-what-you-want) views in the word-processing screen, with easy switching between views.
- Six-key chording for braille and print entry, not timing-based, compatible with most keyboards
- Help screens throughout the program
- Over 100 formatting & translation codes for a high level of flexibility
- A library of user-configurable styles
- A user-extendable template library for even more flexibility
- A "Quick Find Misspelling" feature for increased speed and ease of use
- Embossing to all major braille printers; the first page may be a "banner" for job identification by personnel who don't read braille
- The Duxbury Braille Font for viewing braille dots within other programs
- Single-user and Network licenses available.

7. MAGic: Screen Magnification Software with Speech

MAGic opens up a whole new world of computing to low vision users. Whether you are surfing the Web, creating a document, e-mailing, or engaging in social networking, MAGic provides you the tools you need to work more efficiently.

MAGic's high-definition text delivers smooth, crisp letters for all fonts, even at the highest magnification. MAGic features 46 magnification levels from 1x to 36x. Built-in training tools, text and audio training, talking installation, online Help, and context-sensitive Help work together to make MAGic extremely easy to learn and use.

MAGic with Speech features built-in human-sounding voices that you control independently for speaking text, mouse echo, and typing echo. Speech On Demand™ lets you easily access this aid only when you need it.

Features of MAGic:

- 46 magnification levels from 1x to 36x
- High-definition text provides crisp fonts for hours of comfortable use
- High-definition mouse and cursor enhancement options
- Built-in color enhancements eliminate glare and increase contrast
- Unique productivity tools that enable users to excel at their jobs
- Dual-monitor & Citrix Remote Access support for greater workplace opportunities
- Speech option adds human-sounding voices to speak text and echo user actions

8. ZoomText

ZoomText® is a new generation of adaptive software for all versions of Windows, that integrates multiple technologies to achieve a total low-vision solution. The ZoomText family of software consists of two product levels based on the world's leading magnification program, ZoomText.

The new ZoomText Magnifier/ScreenReader gives you all the features of ZoomText Magnifier, plus powerful screen reading that's easy to use. ZoomText Magnifier/ScreenReader echoes typing, reads information pointed to by the mouse, and speaks program events as they occur. Flexible verbosity settings give you complete control over the amount of information spoken by ZoomText.

Features in Version 9 (See Fig.2)

- xFont technology: With our new xFont technology, you'll see amazingly clear text at all magnification levels. All types and sizes of text are displayed with unmatched clarity, in all of your applications. Once you've seen ZoomText 9.0 with xFont, no other screen magnifier will do.
- Application Settings give ZoomText the intelligence to adjust settings on the fly whenever you switch applications. Just save the settings you like for each application and ZoomText restores them automatically.
- The new Text Finder makes it easy to locate words and phrases in any program or document window. Type what you're looking for and ZoomText finds it in an instant.
- ZoomText's new Reading Zones, you can quickly see and hear selected locations in any application – a real timesaver that eliminates aimless scrolling.
- New 2.5x magnification is sure to satisfy users who have said "2x is not enough and 3x is just too much". And for high magnification users that are migrating to super high resolution screens, ZoomText's magnification is extended from 16x all the way to 36x.
- User Interface has been redesigned with a fresh look and improved functionality. Each toolbar button contains an intuitive icon and label for easy identification. Buttons are grouped by function and the group label is a clickable link, which opens the associated dialog box.
- Provides synchronized magnification and screen reading, designed for the low-vision user. Level 2 speaks all on-screen text, echoes typing and automatically reads multi-page documents.

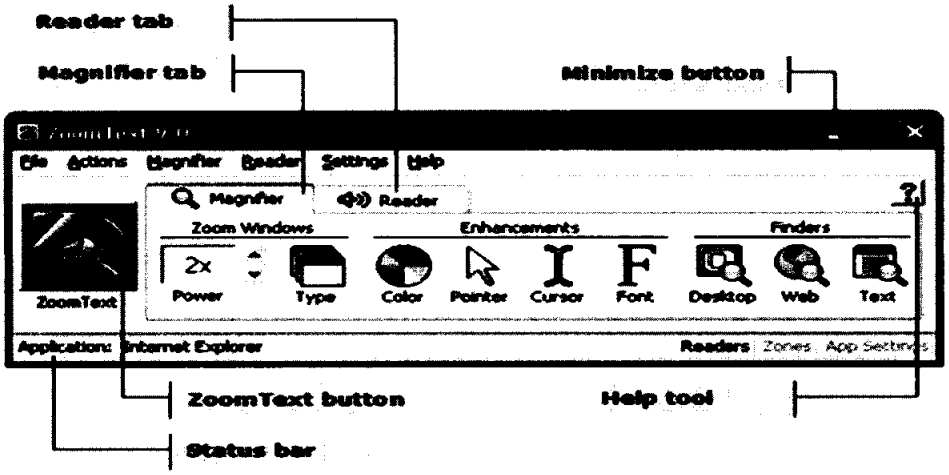


Fig 2. Zoomtext 9.0

9. JAWS (Job Access with Speech)

JAWS use an integrated voice synthesizer and the computer's sound card to output the content of the computer screen to speakers. JAWS also outputs to refreshable Braille displays. This software package can be made available on workstations throughout the library. JAWS supports popular applications such as e-mail programs, word processors, spreadsheets, web browsers, project management and research tools, contract management software, presentation software, web development tools, software development tools, database management software, sound editing software, and much more.

JAWS Features:

- Talking installation - fast and easy
- Two multi-lingual speech synthesizers - Eloquence and Vocalizer with great natural-sounding speech. Sample and download Vocalizer voices.
- DAISY-formatted basic training in text and audio
- More than 15 years experience working with Windows, distributed in 55 countries, and translated into 24 languages
- JAWS 11.0.1467 and later supports dual monitors
- Research It at your fingertips - fast and simple to look up information like definitions, sport scores, area codes, stock listings, and more
- Convenient OCR - with just a few simple keystrokes, access any image on the screen that includes text.

10. Open Book

Open Book is software developed for blind and visually impaired individuals to read, edit, and manage scanned images from books, magazines, manuals, bills, newspapers, and other printed documents. It essentially turns a computer system into a scanning and reading machine. Additionally, OpenBook comes complete with a wide range of productivity tools such as email capabilities, a word processing system, one-of-a-kind page layout descriptions, and a whole menu of features for low vision users.

Open Book is a software program that turns your PC, scanner and sound card into a full-featured reading machine. Scan a page using a flatbed scanner, and Open Book will read that page aloud to you. Or, open and read a text or word-processing file. Open Book lets you alter the way the page is read aloud to you or, if you have low vision, modify the way the page is presented on the screen.

Open Book Ruby Edition is the latest version of Open Book. It comes with a host of new features, many of which were requested by users. You can type in new text, insert bookmarks, move pages - it's all possible with the Ruby Edition. Plus, Open Book comes with a dictionary and thesaurus, spell checker, and search feature.

Open Book includes many features specially designed for ***low vision users***:

- Exact View lets you scan and display a page on the screen exactly as it is in the original document, including graphics, columns and other elements that affect how the page looks.
- Zoom allows you to change the display of the scanned page from 25% of normal size to 500% of normal size.
- Color Combinations lets you select text and background color combinations to make it easier to see the text on the screen.
- Visual Settings gives you control over the font type and size, text, background, and cursor colors, the margin size, and spacing between characters, word, lines and sentences - all to make the page more readable.

11. WYNN

WYNN was designed with the guidance of students and adults with Specific Learning Disability and special educators. While using with a standard PC, WYNN lets the user open a file and hear it read aloud, or scan in a page using a flatbed scanner and read that aloud. Once a page is opened, it can be edited by adding text or making corrections. The page can be altered for screen presentation as well as the way it is read aloud to users. To help with studying, users can insert notes and bookmarks, highlight sections, or look up words in the dictionary.

12. Magic Cursor

Magic Cursor/GUS was developed to allow a person to do mouse clicks if they could not use an adaptive switch. Ideally suited for people with: Quadriplegia, Cerebral Palsy, Multiple Sclerosis, Muscular Dystrophy, ALS, Carpal Tunnel Syndrome and any other disability where the user has little or no control of their hands to use a standard mouse. Dwell Selection software. Magic Cursor/GUS automatically does mouse clicks for a person using **Tracker** or any alternative mouse.

13. Dragon Dictate :

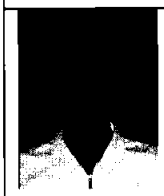
Dragon Dictate, not only enables the user to dictate into virtually any Windows-based program, but also to control Microsoft Office applications. Dragon Dictate lets you control Microsoft Office applications, including Excel, PowerPoint, Word, and more, all by voice. Comes with built-in vocabularies and TalkingTools. Headsets are available for checkout from the Media Resources Desk.

12. Conclusion

In conclusion we can say that the area of research regarding disability assistance software is increasing day by day but in a developing phase. Some results are quiet enthusiastic in this direction but it is the need of the hour that govt. as well as private sector should more precisely focus on this area to provide actual benefit to differently able users.

References:

1. http://en.wikipedia.org/wiki/Optacon
2. http://www.compuaccess.com/zoomtext.htm
3. http://www.dnis.org/National-Policy-on-Universal-Electronics.pdf
4. http://www.dnis.org/pressrelease.php
5. http://www.freedomscientific.com/fs_support/documentation/OPENBook4Docs/OPENBook4Rubyed.pdf
6. http://www.freedomscientific.com/products/low-vision/MAGic-screen-magnification-software.asp
7. http://www.kurzweiledu.com/products/k3000-win.html
8. http://www.unicef.org/india/media_610.html
9. The entire web link accessed between 27th Jan & 31st Jan 2014 to collect information.

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Building Library Circulation in a Content Management System: *An Experience with Web Librarian*

Rupesh Kumar A



There have been successful attempts to develop sophisticated tools to integrate library search features into content management systems. While content management systems offer a great variety of plugins with diverse functionalities, there is a lack of tools for small libraries with basic requirements to build circulation system integrated into a content management system. WordPress is a popular content management systems used to build and manage modular websites. Web Librarian is a WordPress plugin that allows creation of a library collection and circulation system inside the WordPress site. This paper attempts to demonstrate the use of Web Librarian plugin and its functionalities.



content management, CMS, circulation, wordpress, web librarian

1. Introduction

A Content Management System (CMS) is a software which allows creation, publishing, editing and managing content using a central interface with a standard workflow and collaborative environment. A CMS which allows deploying content on Web pages is known as a Web CMS. While there have been successful attempts build tools to integrate the Web OPAC and CMS to offer search and tagging features to users, there is lack of simple tool to build library circulation system in a content management system. WordPress with Web librarian plugin address this issue.

2. WordPress

WordPress is a free web content management system which can be used to create modular websites. It is very popular and has a large developer community. There are thousands of plugins and themes offering a variety of functionality. The current version is 3.8.1. This cross-platform CMS may be installed on LAMP (Linux, Apache, MySQL, PHP) or WAMP (Windows, Apache, MySQL, PHP) environment.

3. Web Librarian Plugin for WordPress

Web librarian is "a WordPress plugin that implements a basic library collection and circulation system." (Wordpress, 2014) This plugin started as a portable cross-platform that the Wendell Free Library as a transition system to traditional card-based circulation system. It has transformed into a web-based circulation system to Deepwoods Software's Home Librarian 3 System. (Web Librarian WP Plugin User Manual, 2013).

The current version of Web librarian is 3.2.9.9 compatible up to version 3.5.2 of WordPress. The plugin may be downloaded from the WordPress plugin directory at http://wordpress.org/plugins/weblibrarian/.

4. Installation

- The Plugin may be installed by uploading the zip file to WordPress plugin. The following figures demonstrate the installation.
- Login to the WordPress site using administrator username and password.



Fig 1. WordPress admin login

Go to Plugins > Add New

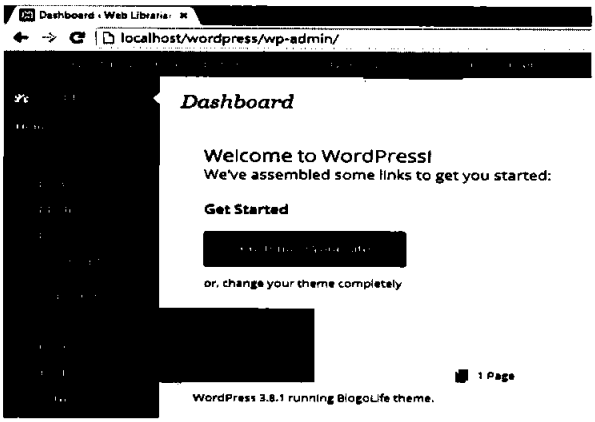


Fig 2. Adding a new plugin

Browse to the weblibrarian.zip file and upload. Click "Install Now". The errors may be ignored. Activate the Web Librarian WP Plugin by clicking "Activate Plugin".

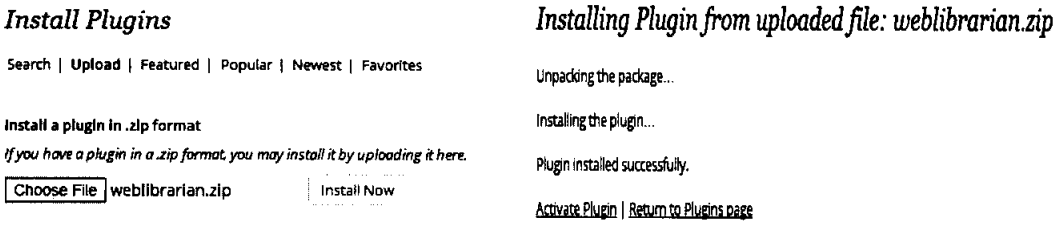


Fig 3. Installation of Web Librarian Plugin

5. Functionalities

=

Web Librarian offers the following functionalities:

Functionality	Activities
Manage Patrons	Add, remove and edit patrons
Manage Collection	Add, remove and edit items in the collection
Manage Circulation	Check out, Check in and place hold on items

6. Users and Privileges

The following users may be created with privileges indicated.

- Librarian: having Manage Patrons, Manage Collection and Manage Circulation privileges. This role can also edit users.
- Senior Aid: can manage collection and manage circulation.
- Volunteer: can only manage circulation

It may be noted that the above users are exclusive to the Web Librarian plugin framework and are separate from the site administrator.

7. Creating a user

After installing the Web Librarian plugin, users may be created in order to handle the operations.

Go to Users > Add New. Select the appropriate role (Librarian, Senior Aid or Volunteer) in the 'Role' column.

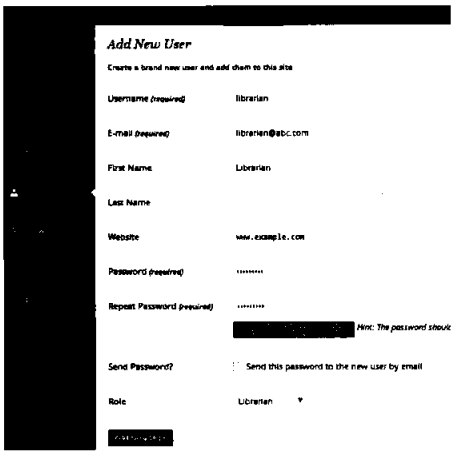


Fig 4. Adding a new user

After creating the users, one can log in with the user credentials. Following screenshot shows login with Librarian credentials.



Fig 5. Librarian login

8. Adding a Circulation Type

In order to enable the circulation function, circulation types should be added. Circulation type refers to the type of document available for circulation. This has two attributes: Type Name and Loan Period. This functionality defines the number of days a type of document may be lent out.

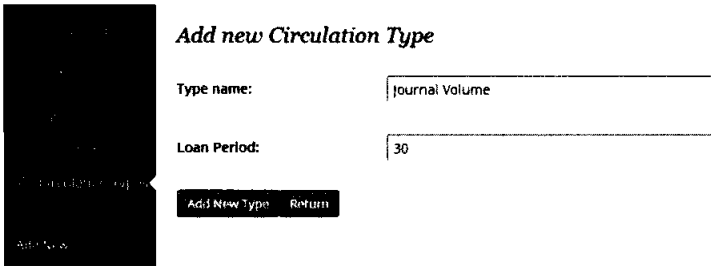


Fig 6. Adding new circulation type

9. Adding a new item into the Collection

A new item may be added to the collection using the Collection functionality. The following fields are to be entered: Barcode (essentially the accession number or any other unique identifier), Title, Author, Subject, Description, Category, Publisher Location, Published Date, Edition, ISBN, Type (circulation type), Thumbnail URL, Call Number and one or more keywords.

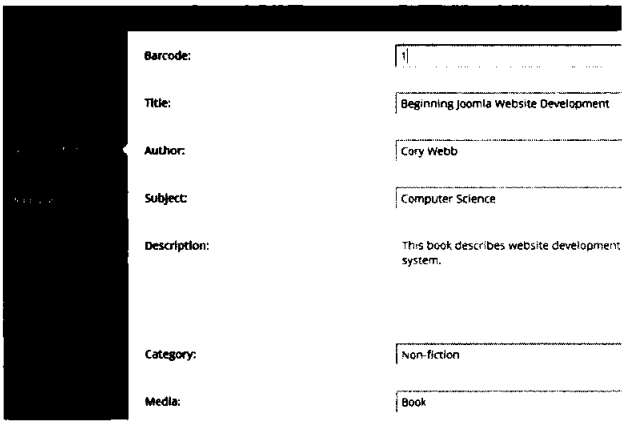


Fig 7. Adding new item in the collection

10. Add New Patron

New Patron may be added by selecting Patrons > Add New. The required fields are Patron ID, Telephone, Last Name, First Name, Address 1, Address 2, City, State, Zip code, Outstanding Fines (if any) and membership expiry date.

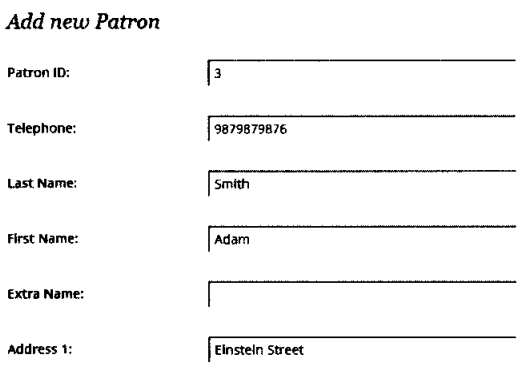


Fig 8. Adding a new patron

11. Check Out and Check In

The various circulation operations may be performed from the Main Circulation Desk. The options available are displayed in the following figure.

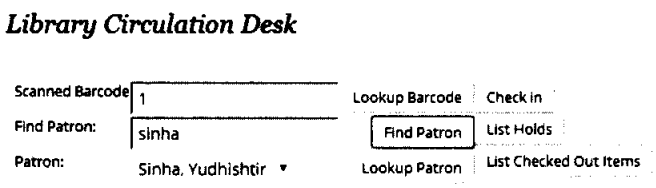


Fig 9. Library Circulation Desk

To check out a particular item, enter patron's name and click 'Find Patron'. This will lead to the circulation record of the patron. Then enter the item barcode and click 'Checkout item'.

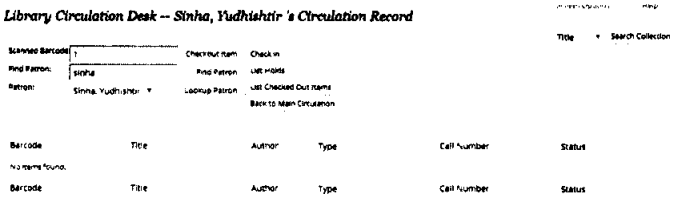


Fig 10. Patron's Circulation Record

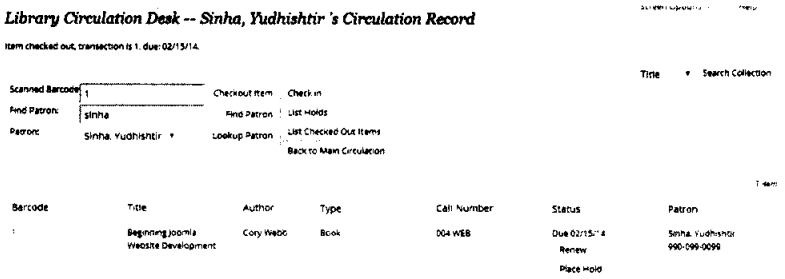


Fig 11. Check out transaction

To check in an item, enter an item's barcode and click 'Lookup Barcode'. The details of the item are displayed. Click 'Check in'.

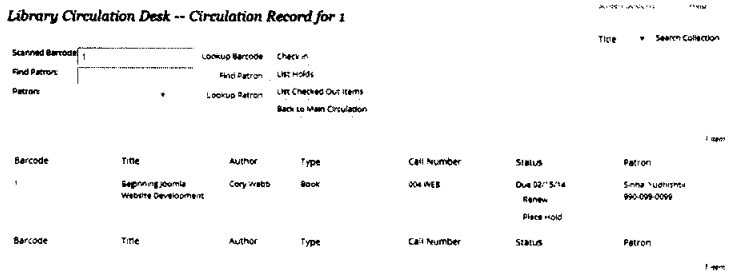


Fig 12. Check in

Renew and place hold options are available when an item it checked out to a user.

12. Circulation Statistics

Web Librarian also maintains the circulation statistics. These statistics may be exported into a csv file.

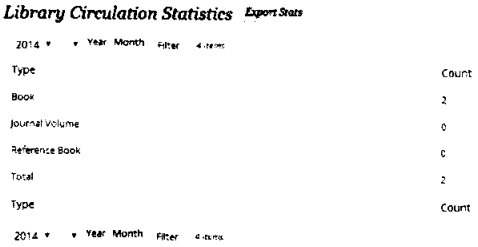


Fig 13 - Circulation Statistics

13. Search Functionality

While managing patrons, collection and circulation are the backend functions of library staff, the users of the library can be provided the search facility on the front end. This is made possible by placing the following short codes on a WordPress Page or Post. Short codes are placed on a page or post by enclosing them in square brackets.

- weblib_searchform
- weblib_itemlist
- weblib_itemdetail

14. **weblib_searchform:** Placing this short code on a page or post generates a search form. The search form provides searching by Title, Author, Subject, Keyword or ISBN. The search results may be sorted by System Sorted (barcode order), Title, and Author either in ascending order or descending order. It may be noted that creating a page in WordPress needs site administrator login. A new page or post may be created using Pages > Add New or Posts > Add New.

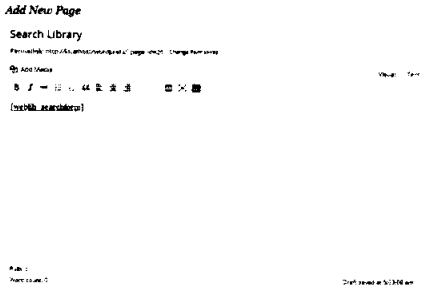


Fig 14 - Adding a page with weblib_searchform short code

Upon publishing the page with weblib_searchform short code, WordPress generates the following page.

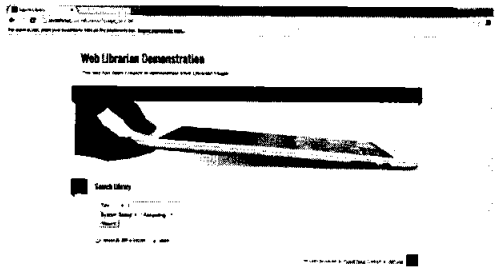


Fig 15 Search Form

15. **weblib_itemlist:** This short code generates a list of results by processing the parameters generated by weblib_searchform short code. By default, it lists out all the items in the collection.

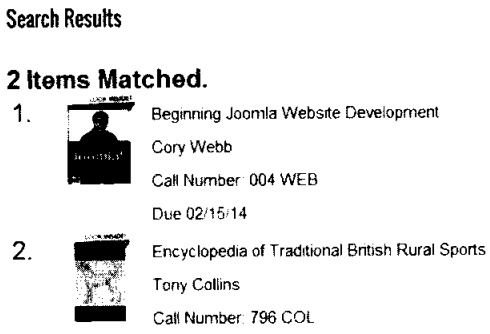


Fig 16 - Search Results (using weblib_itemlist short code)

16. weblib_itemdetail

This short code shows the details of each item listed in the search results. The details of each item are displayed on a separate page which is dynamically generated. This short code works only if moreinfourl parameter is set to true in weblib_itemlist.

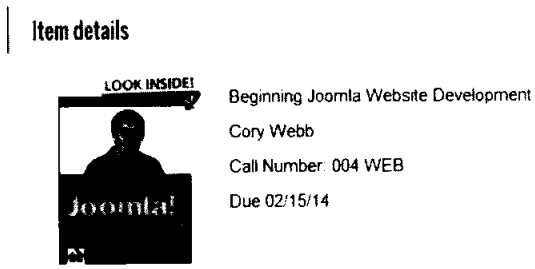


Fig 17- Record display using weblib_itemdetail short code

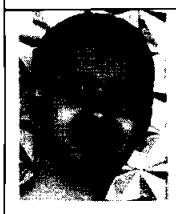
17. Conclusion

Web Librarian plugin provides an opportunity to build a library collection and circulation system within a content management system. Libraries with basic requirements of a circulation system can build it using this plugin with minimal efforts.

References

1. Web Librarian WP Plugin User Manual. (2013, December 5). Retrieved from http://www.deepsoft.com/downloadfile/user_manual.pdf
2. Wordpress. (2014, January 20). Retrieved from http://wordpress.org/plugins/weblibrarian/

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Cloud: *Change Management*

Bagavathi, A **Asok Kumar, S K**

Abstract

The article discusses about the cloud computing, potential changes in the Library organisation and integration of cloud computing services. It also highlights the change management and strategies. Hypotheses are framed on the basis of the objectives of the study. The methodology involves collection of data from the library staff of five law Institutions. A questionnaire is being formulated to fulfil the objectives and to validate the hypotheses. The collected data was analysed and tabulated to draw inferences and findings. Chi-square was used to test the hypotheses formulated for this study. The author concludes by recommending the best practices in Change management.

cloud computing, IaaS, PaaS, SaaS, models of cloud computing, change management, strategies of change management, etc.

1. Introduction

Initially the libraries are managed by minimum resources, minimum manpower and provide services in a limited time. The libraries are mainly focused on collection of printed resources, storing of resources for the primary task of lending. Due to the information explosion and technological development the libraries have been started doing service like resource sharing by interlibrary loan, union catalogue, catalogue sharing, and document sharing with much vacillation. Now in the current scenario we are living in the info whelm world and we are bombarded with information. Hence to fulfil user's requirements by providing services, the library has been computerised, automated, and digitalised even though the libraries are facing many problems like:

- Space
- Expensive
- High staffing
- High infrastructure and resources
- Time consuming
- Time restriction
- Limited services
- Location specific
- Single access resource
- Limited growth
- Platform dependent
- Portability is difficult

However the changes seem to be continuing. With the growing popularity of Internet it is essential to understand the intricacies of new technology in World Wide Web .The 21st century libraries expect the following:

- Limited space
- Economical
- Minimal and adequate staffing

- Limited infra.
- Limited tech resources and skill sets
- Time independent service
- Location independent service
- Instant service
- User friendly technology and service
- Multiple access of resources
- Exponential growth
- Members of the service provider will be using the same platform
- Portability should possible among the member of the service provider
- Sharing of information and resources should possible among members of the service provide.
- Optimum utilization of resources should possible among the members.
- Security should available

Hence the library has to find and utilize the available technology for its advantage to fulfill the 21st century requirement. With the advent of Information Technology, the traditional librarians have to acquire the skills of new ICT. Before mastered it fully, the library professionals have to understand the strategies of knowledge management to get involved in cloud computing.

2. Need for this study

Generally when change management topic is discussed, there is always mention about the resistant of the staff for change management. This instigated the researchers to take up this topic and see whether the library staffs have a positive attitude or negative attitude towards cloud change management if it is implemented in their libraries.

3. Objectives of this study

- To indentify the available resources of the five law institution Libraries.
- To indentify the awareness of library staff on cloud computing and the additional Library services.
- To study the relation between the awareness of cloud computing with regards to institution, designation, and qualification.
- To define the relation between the opinion of staff member on change management regarding Institution, designation and qualification.
- To define the relation between awareness of cloud computing and the staff opinion regarding change management.
- To draw inference from the study and enumerated the findings.

4. Methodology

A short questionnaire consisting of sixteen questions was designed and it was distributed among the library staff of Tamil Nadu Dr Ambedkar Law University, Chennai, National Law School Bangalore, National Law University Delhi, NALSAR University of Law Hyderabad, National Law Institute University, Bhopal. However it was possible to collect responses from 48 library staff of these five law institutions. The data

collected was tabulated and presented in tables, which are analyzed to draw inferences and findings. Chi-square was used to test the hypotheses formulated for this study.

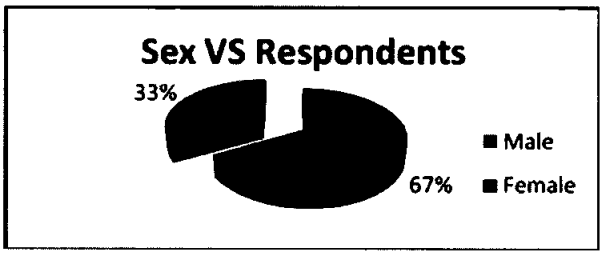
5. Analysis and Interpretation of Data

Table -1: Institution vs. Respondents

Sl. No.	University Name	Number
1	Tamil Nadu Dr Ambedkar Law University, Chennai	11
2	National Law School , Bangalore	10
3	National Law University Delhi	10
4	NALSAR University of Law, Hyderabad	9
5	National Law Institute University, Bhopal	8
	Total	**48**

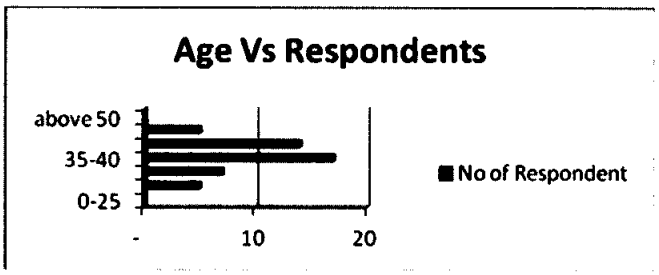
The above table presents the respondents and the Institution. The more number of respondents are from the Tamil Nadu Dr Ambedkar Law University library, Chennai.

Chart-1



From the above chart it is found that the male respondents are 67% and the female respondents are 33%. Hence the male respondents are high and the female respondents are low.

Chart-2



From the above chart it is found that majority of the respondents are in the age group of 35 to 40 and the second largest group are between the age group of 40-45. Below 25 are less in number.

Table – 2: Designation vs. Respondents

Sl. No.	Designation	Number
1	Librarian	2
2	Deputy Librarian	3
3	Assist. Librarian	11
4	Lib. Assistant	6
5	Technical Assistant	16
6	RC	3
7	CLRS	7
	Total	**48**

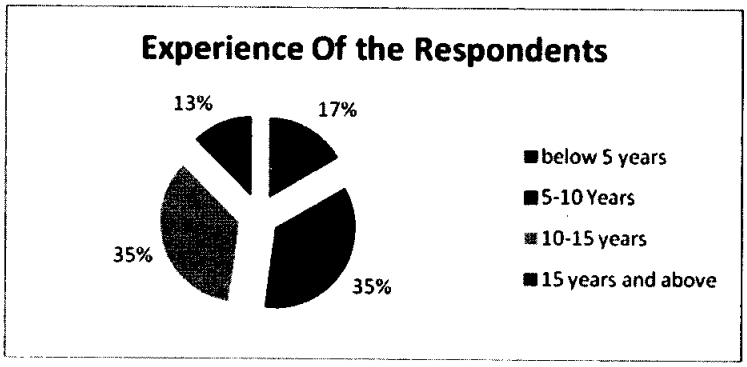
From the above table it is inferred that the respondents of Technical assistant are in high numbers 16 and the respondents of Assistant librarians are the next higher number 11.

Table - 3: Qualification vs. Respondents

Sl. No.	Qualification	Number
1	PhD	**8**
2	MPhil	**20**
3	MLIS	**12**
4	BLIS	**6**
5	CLIS	**2**
	Total	**48**

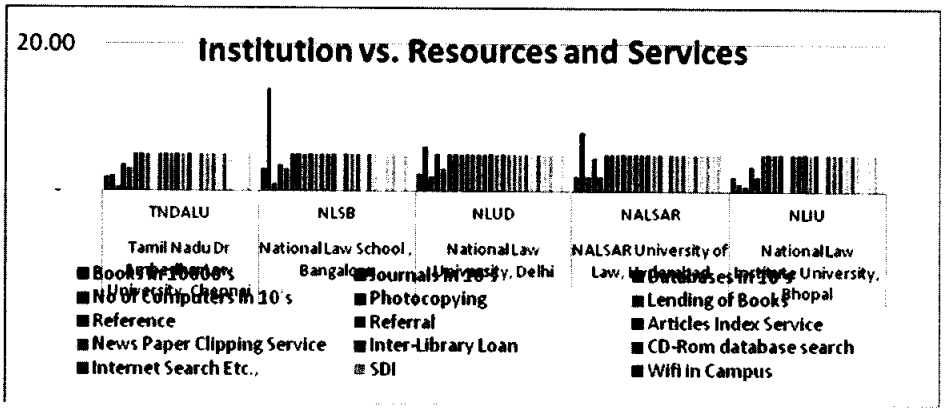
From the above table it is found that among the total 48 respondents, the majority of 28 respondents are highly qualified having MPhil and PhD qualification.

Chart-3:



The above chart illustrates that the majority of 20 respondents are having 10-15 years of experience, 16 respondents are having 5-10 years of experience, 7 respondents are having below five of experience and 5 respondents are having above 15 years of experience.

Chart-4



The above chart shows that all the 5 institutions are having resources of books, journals, Databases, computers etc. Among the 5 institutions NLS, Bangalore has the highest number of books and journals with 30000 books and 140 journals, followed by NLU, Delhi, with 24000 books and 60 journals. All the 5 institution have facilities like Photocopying, Library Automation, Broad Band Connection, Internet search, OPAC, CD Rom Database, Laptop for Faculty, Wi-Fi in Campus etc. Four institutions provide services like SDI,

Web OPAC, Article Index, News Paper clipping, language Lab, digital library etc. Only 2 institutions have Tele / Video conference and language Lab facility.

Table - 4: Respondents vs. Change Management Objectives

Sl. No.	Description	Yes	No	Total
1	Willing to take challenging Job	21	27	48
2	Willing to accept and implement new Procedures	32	16	48
3	Willing to accept changes	26	22	48
	Total	79	65	144

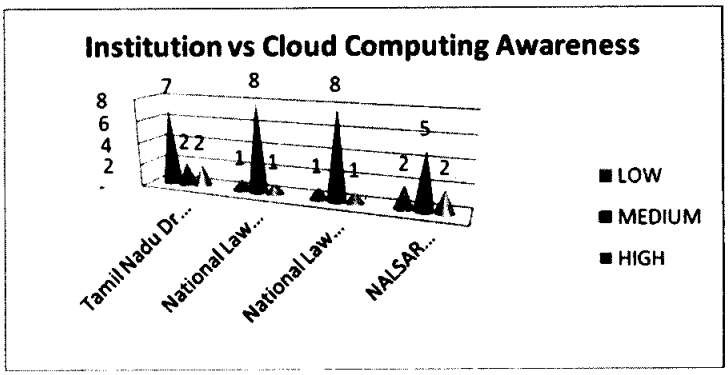
From the above table it is found that 21 respondents state that they are willing to take challenging Job and 32 have accepted to implement new procedures and 26 respondents are willing to accept changes. It is interesting to note that majority of the respondents are willing to accept change management.

Table - 5: Respondents vs. Cloud Computing Awareness

Sl. No.	Description	No of Respondents
1	Low Awareness	12
2	Medium Awareness	29
3	High Awareness	7
	Total	48

From the above table out of the 48 respondents 7 have high Awareness on cloud computing, 29 have medium awareness and 12 have low awareness on Cloud Computing.

Chart-5



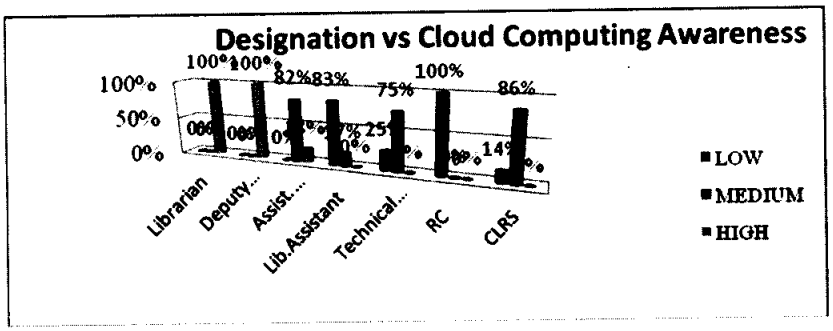
The awareness of cloud computing are high in NLS and NLU and the awareness of cloud computing in other institutions are medium.

Chi square Table-1: Institution vs. Cloud Computing Awareness

Sl. No.	Description	LOW	MEDIUM	HIGH	Chi square Value
1	Tamil Nadu Dr Ambedkar Law University, Chennai	5.43	3.04	0.10	**8.56**
2	National Law School, Bangalore	1.08	0.80	0.14	**2.03**
3	National Law University Delhi	1.08	0.80	0.14	**2.03**
4	NALSAR University of Law, Hyderabad	0.08	0.01	0.36	**0.45**
5	National Law Institute University, Bhopal	0.01	0.02	0.02	**0.06**
	Total	**8**	**5**	**1**	**13**

From the above table it is found that the Chi Square Value is greater than the Table value and the null Hypothesis is rejected. It is proved that there is a significant difference among the Institutions on the awareness of cloud computing among the staff members. Irrespective of the institutions, the awareness of cloud computing is Medium among staff members of the institutions.

Chart-6



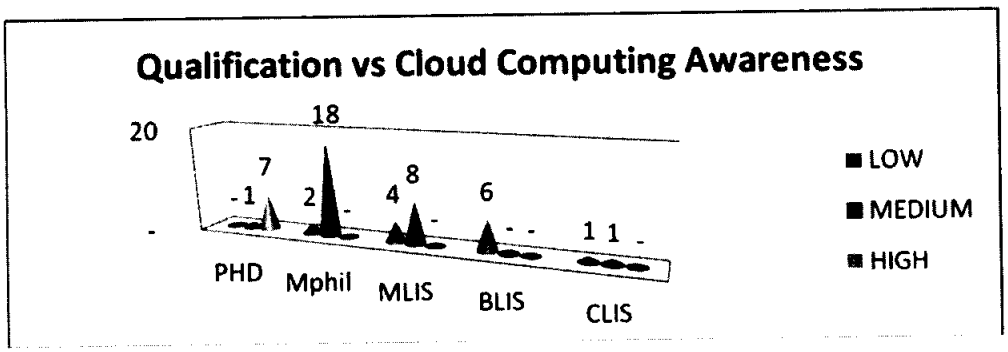
The awareness is high among the higher-ranking staff and it reduces in accordance to the designation. The awareness is low among the low ranking staff members and clerical Staff.

Chi square Table-2: Designation vs. Cloud Computing Awareness

Sl. No.	Designation	LOW	MEDIUM	HIGH	Chi square Value
1	Librarian	0.54	1.17	10.01	**11.71**
2	Deputy Librarian	0.81	1.75	15.01	**17.57**
3	Assist. Librarian	2.98	1.04	0.10	**4.12**
4	Lib. Assistant	7.01	1.79	0.88	**9.67**
5	Technical Assistant	0.03	0.76	2.33	**3.12**
6	RC	5.89	1.75	0.44	**8.08**
7	CLRS	0.42	0.90	1.02	**2.34**
	Total	**17.68**	**9.15**	**29.78**	**56.61**

The Chi Square Value is greater than the Table Value. Hence the Hypothesis is accepted and the null Hypothesis is rejected. It is found that there is significant difference on the awareness of Cloud computing among the different designation.

Chart-7



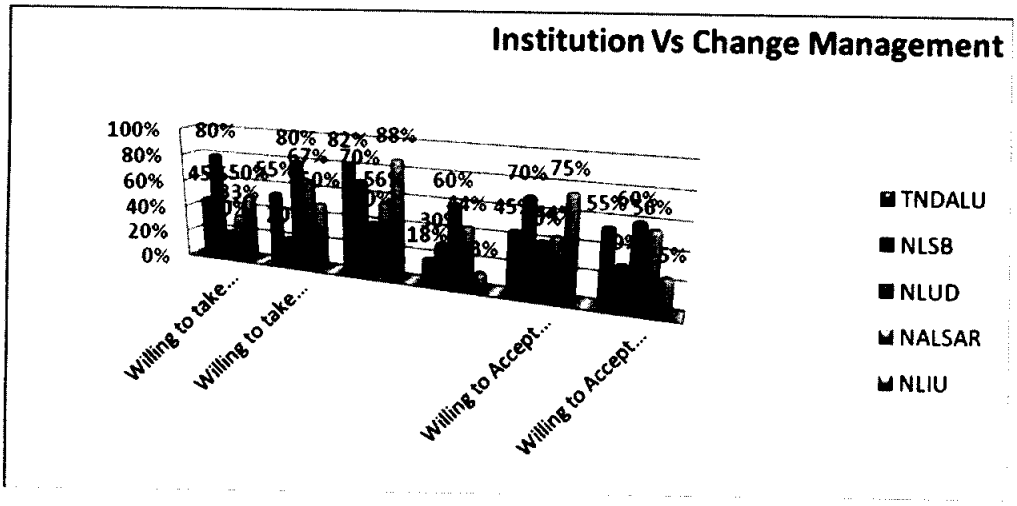
From the above chart it is understood that the highly qualified staff have more Awareness on cloud computing. The Awareness is low among the less qualified staff members.

Chi square Table-3: Qualification vs. Cloud Computing Awareness

Sl. No.	Description	LOW	MEDIUM	HIGH	Chi square Value
1	PHD	2.17	2.88	29.17	**34.21**
2	MPhil	2.16	3.44	2.92	**8.51**
3	MLIS	0.17	0.14	1.75	**2.07**
4	BLIS	11.78	3.50	0.88	**16.15**
5	CLIS	0.39	0.02	0.29	**0.70**
	Total	**17**	**10**	**35**	**62**

As per the Chi square Value the null Hypothesis is rejected. Therefore there is significant difference on the awareness of Cloud Computing based on the Qualification of the respondents.

Chart-8



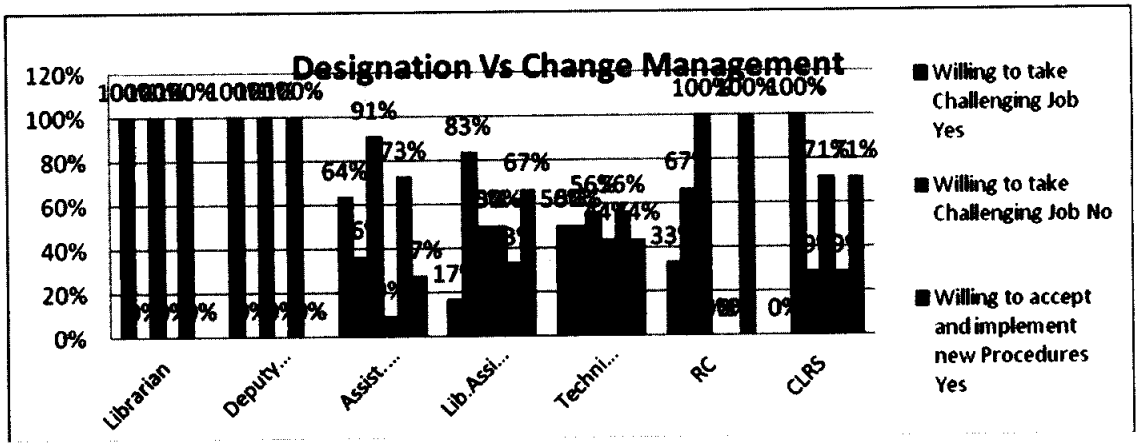
The above chart explains that majority of the respondents have given positive opinion of change management in NLS.

Chi square Table-4: Institution vs. Change Management

Sl. No.	Description	Yes	No	Chi square Value
1	Tamil Nadu Dr Ambedkar Law University, Chennai	0.02	0.03	**0.05**
2	National Law School , Bangalore	1.71	2.13	**3.84**
3	National Law University Delhi	2.67	3.33	**6.00**
4	NALSAR University of Law, Hyderabad	0.60	0.75	**1.35**
5	National Law Institute University, Bhopal	1.01	1.26	**2.27**
	Total	**6**	**8**	**14**

The Chi square Value is higher than the table value. Hence the Hypothesis is accepted and it is proved that there is a significant difference among the Staff of the various institutions and their opinion regarding change management.

Chart-9



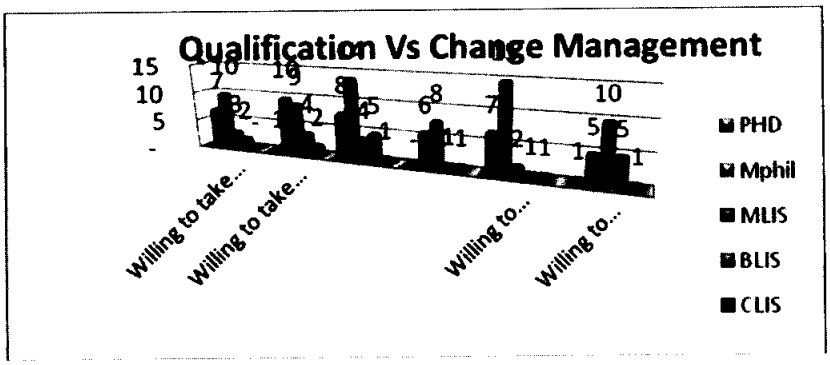
The higher-ranking staffs have given positive opinion on Change Management. 100% of Librarians and Deputy Librarians have given positive opinion with regard to Change management Objectives and it reduces in accordance to the designation.

Chi square Table-5: Designation vs. Change Management

Sl. No.	Description	Yes	No	Chi square Value
1	Librarian	2.13	2.67	**4.80**
2	Deputy Librarian	3.20	4.00	**7.20**
3	Assist. Librarian	2.42	3.03	**5.45**
4	Lib. Assistant	1.60	2.00	**3.60**
5	Technical Assistant	0.02	0.02	**0.04**
6	RC	0.20	0.25	**0.45**
7	CLRS	5.04	6.30	**11.34**
	Total	**15**	**18**	**32.88**

According to the above Chi square Value the hypothesis has been accepted and the null hypothesis is rejects. It is proved that there is a significant difference among the various designations of the staff and their opinion regarding change management.

Chart-10



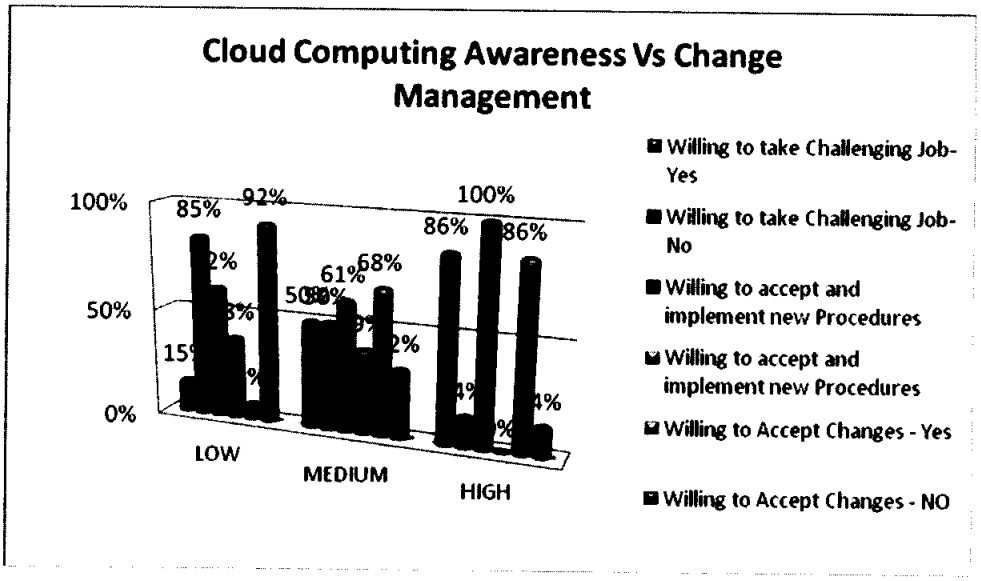
This chart explains that majority of the PhD and MPhil qualified respondents have given positive opinion regarding change management and the other respondents has given less positive opinion on change management.

Chi square Table-6: Qualification vs. Change Management

Sl. No.	Qualification	Yes	No	Chi square Value
1	PHD	5.63	7.04	**12.68**
2	MPhil	0.96	1.20	**2.17**
3	MLIS	6.05	7.56	**13.61**
4	BLIS	0.40	0.50	**0.90**
5	CLIS	0.53	0.67	**1.20**
	Total	**13.58**	**16.98**	**30.56**

From the above table it is found that the Chi square Value rejects the null Hypothesis and it is proved that there is a significant difference among the Staff members based on the qualification and their opinion regarding change management.

Chart-11



From the above Chart it is found that the respondents having higher awareness on cloud computing have given positive opinion on change management. Hence The Change management opinion is directly proportional to the Awareness of cloud computing.

Chi square Table-7: Cloud Computing Awareness vs. Change Management

Sl. No.	Description	Yes	No	Chi square Value
1	LOW	5.25	6.56	**11.82**
2	MEDIUM	0.24	0.30	**0.54**
3	HIGH	4.61	5.76	**10.37**
	Total	**10**	**13**	**23**

From the above table it is found that the null Hypothesis is accepted as the Chi square Value is lower than the

table value. Hence it is proved that the awareness on cloud computing is directly proportional to the Positive opinion regarding change management.

6. Findings

- More responses were received from the University-1 Library
- Male staff are found to be predominant than the female staff.
- Younger staff are less in number than the older staff.
- Nearly 20 staff members are having work experience between 10 and 15 years
- It is understood that most of the staff are having medium awareness about cloud computing.
- Most of the staff are willing to accept change management.
- The awareness of cloud computing are high in NLS and NLU.
- The awareness is high among the higher-ranking staff and it reduces in accordance to the designation.
- The highly qualified staffs have more Awareness on cloud computing than the less qualified staff members.
- Different levels of the staff do not share the same opinion regarding the change management.
- Qualifications of the staff have an impact on their opinion regarding change management.
- The staff from different libraries included in this study does not share the same opinion about the change management.
- The change management opinion is directly proportional to the awareness of cloud computing.

7. Conclusion

The current information age leads the world to the cloud environment. In order to go along with the tide, the institutions and the respective libraries have to shift the library functions and services in Cloud environment. Further the Cloud environment is economical for a developing country like India, where a group of institutions will be able to share and optimally utilize the resources through Community cloud. Hence Library professionals have to equip themselves for the eventuality. As per the study it is found that change management implementation depends on various factors such as the institution, age, experience, designation, and qualification of the staff of the libraries. But the study finds that all the staff members included in this study do not share the same awareness. Hence the awareness of cloud computing is essential prerequisite for the implementation of change management. This can be achieved by providing training and orientation programs for the library staff to accept the change management.

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Cloud Computing: *A New Dawn for Library*

Sushma R. Mawande

Abstract

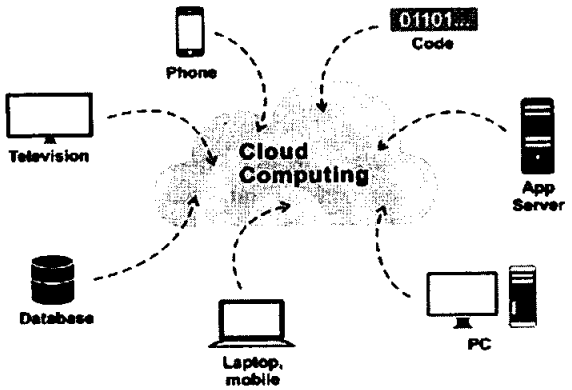
Cloud computing is an emerging technology characterized by an element of novelty where the research community has recently embarked. There has been drastic shift in the trinity of libraries; books which have become electronic, user which prefers web resources than print and the staff which has become Cybrarian. In this canged library landscape there is need to shift our competencies for the challenges offered by IT. Availability of independent computing components on demand like cloud as a CPU, storage in cloud has removed the web of IT and librarians can focus on their mission and services. This paper wills discussing the cloud computing, definitions, characteristics, models and application of cloud computing for new generation libraries.

Cloud Computing, Libraries. Information & communication technology.

1. Introduction

Cloud computing is a computing paradigm, where a large pool of systems are connected in private or public networks, to provide dynamically scalable infrastructure for application, data and file storage. With the advent of this technology, the cost of computation, application hosting, content storage and delivery is reduced significantly. Cloud computing is a practical approach to experience direct cost benefits and it has the potential to transform a data center from a capital intensive set up to a variable priced environment. The idea of cloud computing is based on a very fundamental principal of reusability of IT capabilities. The difference that cloud computing brings compared to traditional concepts of "grid computing", "distributed computing", "utility computing", or "autonomic computing" is to broaden horizons across organizational boundaries.

Internet based computing in which large group of remote servers are networked so as to allow sharing of data-processing tasks, centralized data storage and online access to computer services or resources.



2. Pros and Cons of Cloud Computing

- Customers cannot own the infrastructure they are using; they can only rent it or can pay as they use.
- The major advantage of cloud computing is its less price.
- The companies can invest on lower technology based products and can focus on investing their money on goods and services they specialize.

- Location and device independence can be achieved that enables the users to access Systems from any device and any location.
- Cost and resource sharing between the users provides efficient savings like performance, load balancing, and even locations.

3. Cloud computing solutions for libraries

The library community can apply the concept of cloud computing to amplify the power of cooperation and to build a significant, unified presence on the Web. This approach to computing can help libraries save time and money while simplifying workflows.

A brief list of potential areas of improvement could include:

- Most library computer systems are built on pre-Web technology
- Systems distributed across the Net using pre-Web technology are harder and more costly to integrate
- Libraries store and maintain much of the same data hundreds and thousands of times
- With library data scatter across distributed systems the library's Web presence is weakened.
- With libraries running independent systems collaboration between libraries is made difficult and expensive
- Information seekers work in common Web environments and distributed systems make it difficult to get the library into their workflow
- Many systems are only used to 10% of their capacity. Combining systems into a cloud environment reduces the carbon footprints, making libraries greener

These improvements can be grouped into three basic areas: technology, data and community. Each offers some general and some unique opportunities for libraries. Looking first at the technology that most current library systems employ several benefits of cloud computing solutions surface.

4. Benefits of Cloud Computing in Libraries

The benefits of a cloud computing approaches in libraries are like as to take advantage of emerging technology to fully participate in the Web's information landscape, increased vision and access of collections, reduced duplication of effort from networked technical services and collection management, to streamline workflows, optimize to fully benefit from network participation, sharing intelligence and improved service levels enabled by the large scale aggregation of usage data, to make libraries greener by sharing computing power thus reducing carbon footprints. The participating libraries in networked environment using the same, shared hardware, services and data rather than hosting of hardware and software on behalf of individual libraries can result in cut the total costs of managing library collections and enhancing the both library user's experience and library staff workflows. The vision of using cloud computing in libraries is to deliver library resources, services and expertise at the point of need, within user workflows and in a manner that users want and understand. It will free and ease libraries from managing technology so that they can focus on collection building, improved services, innovations and initiatives practices. The cloud computing model will promote libraries and their users to participate in a network and community of libraries by enabling them to reuse information and socialize around Information. It can also create a powerful, unified presence for libraries on the web and give users a local, group and global reach.

We can sum up the following advantages of Cloud computing in libraries.

- Cost saving - Flexibility and innovation
- User centric
- Openness - Transparency
- Interoperability
- Representation
- Availability anytime anywhere
- Connect & Converse
- Create & collaborate

Potential areas for improvement in Libraries through Cloud computing:

When we move towards the cloud computing in libraries, we can consider some broad areas like as technology, data and community where we can get solutions through Cloud Computing.

The following potential areas of cloud computing in libraries have

- Most library computer systems are built on pre-Web technology.
- Systems distributed across the Net using pre-Web technology are harder and more costly to integrate.
- Libraries store and maintain much of the same data hundreds and thousands of times.
- With library data scatter across distributed systems the library's Web presence is weakened.
- With libraries running independent systems collaboration between libraries is made difficult and expensive.
- Information seekers work in common Web environments and distributed systems make it difficult to get the library into their workflow.
- Many systems are only used to 10% of their capacity. Combining systems into a cloud environment reduces the carbon footprints, making libraries greener.
- Examples of Cloud computing in libraries:
    - OCLC
    - Library of Congress (LC)
    - Exlibris
    - Polaris
    - Scribd
    - Discovery Service
    - Google Docs / Google Scholar
    - Worldcat
    - Encore

5. Conclusion

The Cloud computing offers numerous benefits for different organizations, individuals and in libraries also. There are also privacy and security concerns. If any library consider to provide cloud services, it has to

think about its personal information, and that of its' users, can best be protected. Carefully review the terms of services or contracts, and challenges the provider to meet its needs. In today's information society, libraries have the opportunity to improve their services with the help of Cloud computing. It is one path for this move into the future which brings numerous advantages for libraries.

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Cloud Computing based Architecture for E-Learning System in B-Schools

Pandev. S K **Md. Sohail**



Cloud computing is one of the most emerging technologies for the for the modern business organizations. Dynamic scalability and resource virtualization capabilities of cloud computing also attracted the academic fertility to adopt it for renovation of the existing academic systems. Indian B-Schools have always shown their curiosity to adopt new technology in their curriculum as well for the modernization and improvement of their academic process. We have proposed a new cloud computing based architecture for E-Learning systems (J-CCELS) in B-Schools. This framework is based on public cloud architecture and exploits the open source platform for its prototype development and deployment. Prototype reveals goods results in digital content management, knowledge sharing, knowledge base integration and virtualization of resources. It may be a suitable solution for all the B-Schools for integrating their resources and knowledge sharing.



Cloud Computing, Open Source Platforms, E-Learning, Knowledge Management, Virtualization.

1. Introduction

Cloud computing has become a buzz word now a days. Cloud computing has expanded it's horizon in different sectors and areas. Cloud computing is a conceptual computing model and it is based on n the Internet services .Cloud computing ensures that users can simply use the computing resources on rental basis i.e. demand and pay money according to their usage by a metering pattern. In cloud computing, all the computing resources are treated as service.

E-learning is a network or especially Internet-based learning process. It uses internet technology to design, implement, select, manage, support and extend learning. E-learning replaces traditional education methods and improves the efficiency of education systems and flows.

E-learning is widely used today on different educational stages: continuous education, company trainings, academic courses, etc. There are various e-learning solutions from *open source* to commercial. There are three types of users involved in an e-learning system: Administrator, user (Client/Learner/Student) and the trainers. Generally E-learning systems are developed on distributed platforms. The framework of a distributed e-learning system includes software components (the client application, an application server and a database server) and the necessary hardware components (client/node, server and telecommunication infrastructure). The aim of this paper is to present a robust cloud computing based e-learning application for developing a virtual and interactive personal learning environment which includes a wide range of technology, and tools for education like open source platform (Moodle/Joomla), open source applications (PHP) and open source database (MySQL). The proposed framework is intended to support structured and semi-structured learning and integrate multiple clouds along with the local and global knowledge base that enable various interactive learning services , knowledge sharing and applications.

2. Proposed Framework

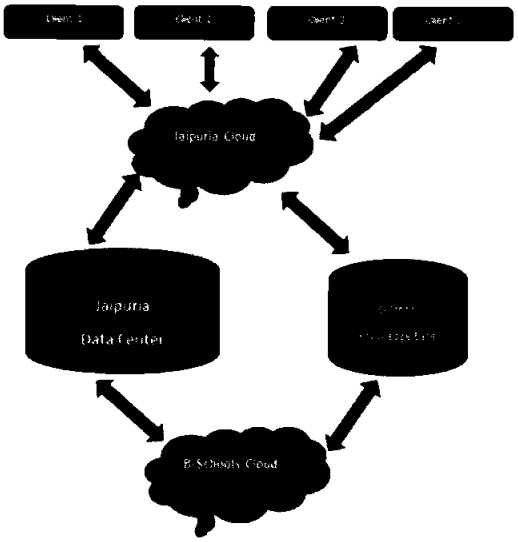
We have proposed a cloud computing based architecture for E-Learning system which can be a suitable solution for the B-Schools .We have given the name "J-CCELS" to our system.

This framework contains following logical components:

- **Client:** These are the users which interact with the system .It includes Super user(overall control and

management), Administrator(privileges of managing some specific modules), K-Trainer (we call it knowledge trainer) and the end users(Learners).

- **Local Cloud:** In includes the combination of local group resources .In our case we have created a local cloud of our Jaipuria Group (resources from different campuses of Jaipuria Institutions).
- **B-School Cloud:** In includes the resources of different leading B-Schools which is based on the public cloud framework.
- **Data Center:** It is our local centralised data center .We call it Jaipuria Data Center. It is connected with local cloud and global cloud and also integrated with B-School Knowledge base.
- **B-School Knowledge Base :** It includes the knowledge resources of different B-Schools which works on public sharing platform with access privileges.



(Fig-1: Proposed framework of J-CCELS)

This E-Learning system is developed on open source platform in which knowledge resources are shared with accuracy, participant's communication is extremely smooth, and cross-platform operations can be executed. The public cloud framework is preferred for global knowledge management.

Our E-Learning System is based on multi-layered architecture which includes three layers: Infrastructure layer, Platform integration Layer and Application layer.

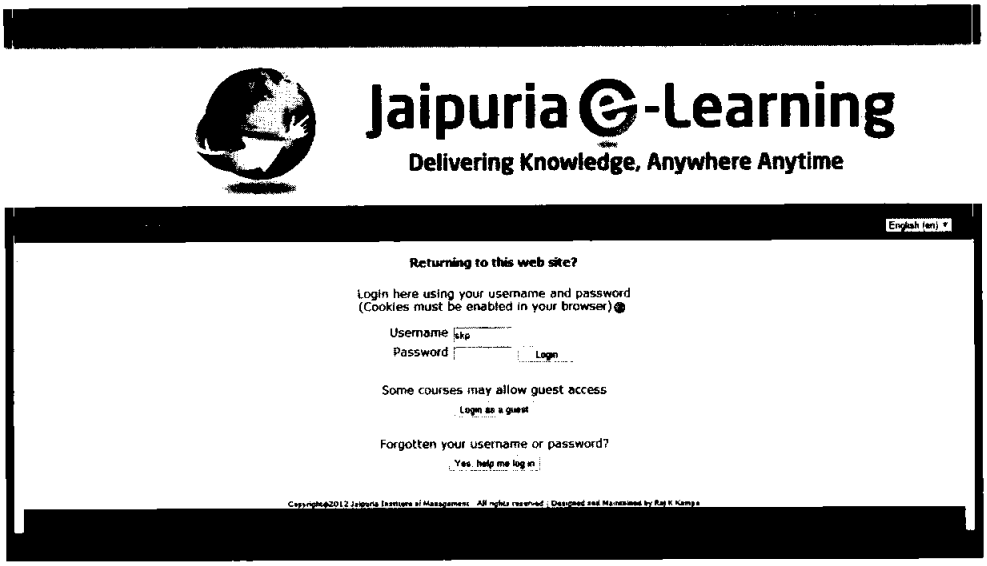
L-1 (Infrastructure): It contains the resources and logical architecture of the information infrastructure .It provides the facility of cross platform content sharing.

L2 (Platform Integration): It provides the cross platform integration for variety of resources of different knowledge base locations and different platforms.

L3 (Application): It is a robust frontend through which the users interact with the system. The interactive resource includes trainer and learners. Our system is based on the full sharing method of the resources. Clients need a web browser to use the interactive experience, mobility and storage services. It contains the interactive materials (audio, video, chat, and forum), courses and sharing teaching resources.

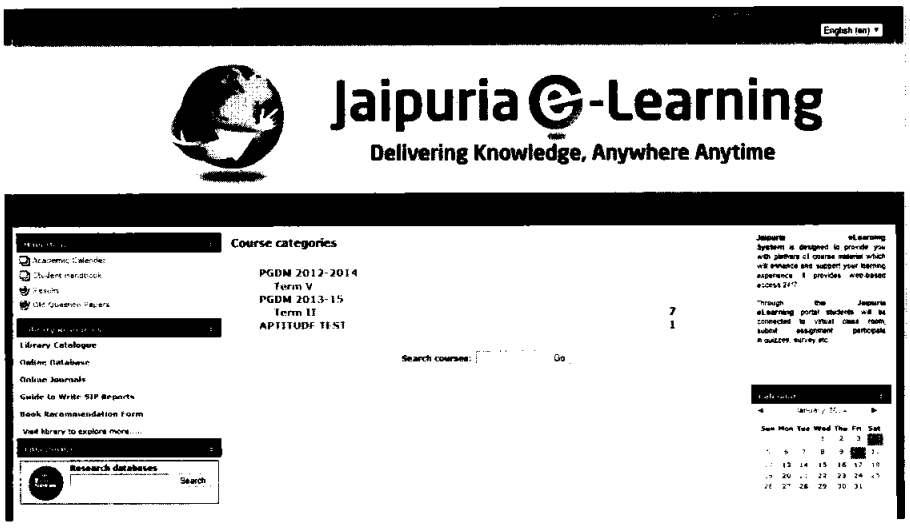
3. Prototype Development *of J-CCELS*

We have developed a prototype of the proposed E-Learning system with highly interactive GUI features .It is developed on open source platform (PHP as a front end & MySQL as backend) Welcome screen provide the panel for different categories of users of the system. Id & Password based first level access control is applied.

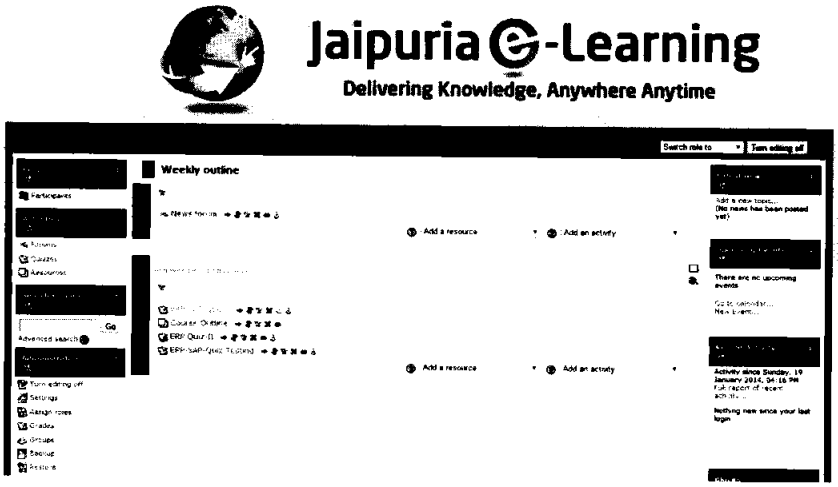


(Fig-2: Welcome screen of J-CCELS)

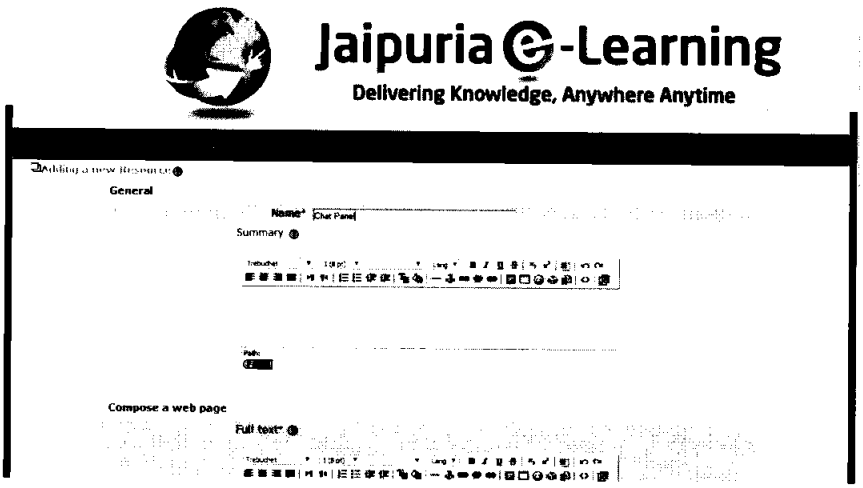
After login to the system, the main screen appears which includes all the resource management modules.



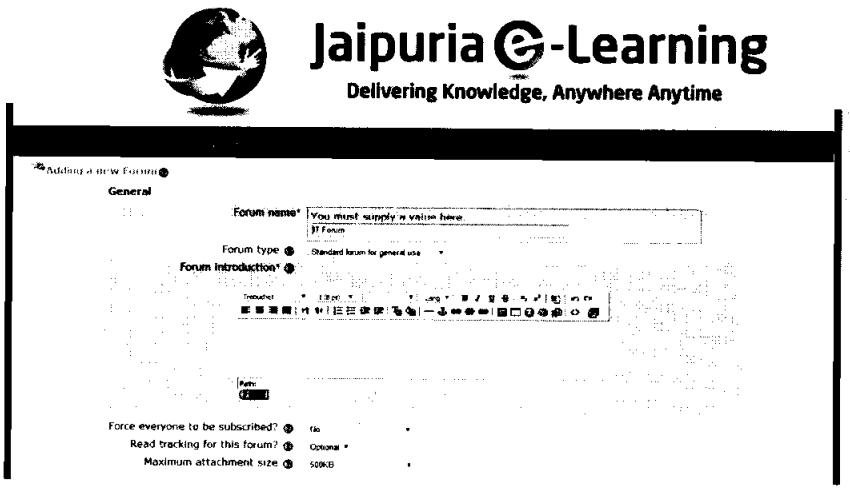
We have to just turn off the editing option to enable the creation of resources and activities.



Example-1: The following screen displays how to create the chat panel for the users.



Example-2: The following screen displays how to create the IT forum for the users.



The simple in interactive GUI of the system ease the process of e-learning activities.

4. Conclusion

Our e-learning system is an open source of learning. This system is working fine for the requirement of B-Schools and it may be used for other Institutions for different online web based academic purpose. The system has some limitation of cross platform integration which can be achieved with new technologies and we can produce a robust and efficient e-learning system.

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Cloud Computing in Academic Libraries

Mohan R. Kherde

Abstract

Library acts as a knowledge resource centre in the present era of knowledge society. Dissemination of well organized knowledge to the needy end stack holders in time is the prime responsibility of library professionals. To perform this task with smoothly and effectively, many more techniques related to ICT are being applying by the professionals in their respective libraries. The cloud computing technology, considered as a third generation of ICT, is a new door open for the professionals to perform their job of disseminating the knowledge. It is now prove that the library professionals are shown keen interest in applying new technology in the library. In view of this in the paper the attempt has been made to introduce the cloud computing technology to the professionals to aware them about it. Components of cloud computing, services, models, benefits and drawback of the technology are discussed. Moreover, the area of libraries where this technology can be applied is also focussed.

Cloud computing, Cloud services, Models, Areas for application, Benefits and Hurdles

1. Introduction

The concept of library is quite old. The place of library is well known as a treasure-house of knowledge. A well-stocked library is an asset to any academic and research institute. With the emergence of computer technology the outlook of this treasure house had been changed. However, since last few years Internet has revolutionized the concept of library in terms of its shape and the way of extending the services to its stack-holders. Information and Communication Technology (ICT) now plays prominent role in improving the library facilities. The advancement of Information and Communication Technology (ICT) has brought paradigm change in almost all the fields. The service sector is highly dominated by ICT.

The sojourn of library starts from its traditional shape and reached up to automated and digital ones after passing through computerized library. Continuous and fast developments in ICT, maintenance of digitized information, shrinking budget, unavailability of skilled manpower and the changing methods of users in procuring of information are the major problems facing today's librarians especially working in higher education. Librarians are searching the solution for the same and adopting the techniques like library co-operation, outsourcing etc. to make the library task smooth and effective. However, these techniques cannot be solved the problems. The new concept i.e. Cloud Computing may solve these up to large extent. Of course, at present it is in infancy stage.

2. Cloud Computing

Today Cloud Computing is a buzz word in the ICT field. National Institute of Standards and Technology, US Department of Commerce defines Cloud Computing as 'it is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction'. In the report titled 'Winds of Change: Libraries and Cloud Computing' of Matt Goldner, the Gartner Group's definition of cloud computing is given as 'a style of computing in which massively scalable and elastic IT-enabled capabilities are delivered as a service to external customers using Internet technologies.' (2010, 5).

3. Components of Cloud Computing

Clients, data centre and distributed servers are the three major components of cloud computing. Each of these three components has to play a significant role in the working of cloud computing. Clients are the devices, through which the information or data, available on cloud is managed. PC, laptop, palmtop, tablet, mobile, PDA etc. are the clients in cloud computing process.

Data centre is set of servers. These servers may be located at one location (may be in one room or building) or in different locations in the network. All the applications are housed in these servers. Subscribers have to subscribe these applications for their use. Distributed server is the third component of cloud computing. Often in cloud computing, the servers are distributed in different geographical locations. In case of failure of one server, the work of subscriber should not affect. Without interruption, the work can switch over to another server located at different sites.

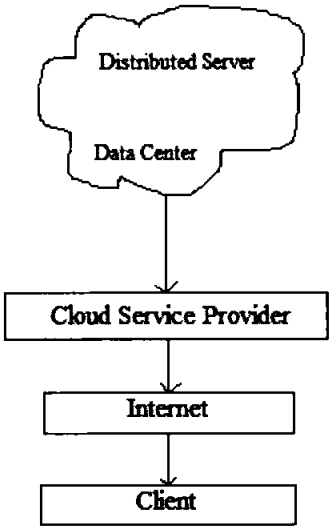


Fig 1 - Structure of Cloud Computing

4. Cloud Services

- **Software as a Service (SaaS) :** In SaaS, instead of buying required software in the library and installed it on the server of the library, it can be acquired on rent basis from cloud service provider. In this case the software is available with the service provider. It is installed on the server of service provider. Library has to subscribe the services of software from service provider. So far as data is concerned, it may either available on the local server of the library or with the service provider.

The major benefit of the SaaS is that the library management need not to invest funds in buying the software. However, the software required for the specific local work of the library may not be available with cloud service provider. In such a situation library itself has to purchase it for its users.

- **Infrastructure as a Service (IaaS) :** In modern library, ample memory space is required to preserve and organize the digitized documents. Large capacity with sufficient memory space and latest configured hardware are required for library. Purchasing, developing and then maintaining this infrastructure in the library is a tedious job. In Indian scenario, unavailability of well IT skilled manpower is the biggest problem before the library management. Further, continuous development and up-gradation of hardware is the another problem. To overcome these problems, infrastructure required by the library can be made available from cloud service provider by paying subscription. In this kind of services, library management can think to subscribe server space, storage space, network equipment etc. from service providers.

- **Platform as a Service (PaaS) :** In computer system, platform is the essential thing to run the software or programs. In computerized/automated libraries various software are required to perform different task. Many a time different operating systems such as Window NT, Linux are required for these software. Investing funds in purchasing these operating systems may not be possible due to shrinking budget or on technical ground. In such situation, it is better to subscribe it for certain period. PaaS through cloud service provider allows this facility to its clients. Under this facility, service provider extents PaaS on monthly rental basis. PaaS offers application development, design, testing and hosting, web service integration, database integration, security, storage facilities to the end users.

Collection of knowledge is the prime factor of library. The collected knowledge is to be managed in the library so as to disseminate it to the proper user at right time. Now a day digitization is the buzz word in the library. Organization and proper storage of this digitized knowledge is a challenge before the library management. Further, much attention is to be paid in providing the security to this huge data. Cloud solves this problem with great extent by extending **Data as a Service (DaaS)**. Therefore, so far as library is concerned this kind of service can be demanded from cloud service provider.

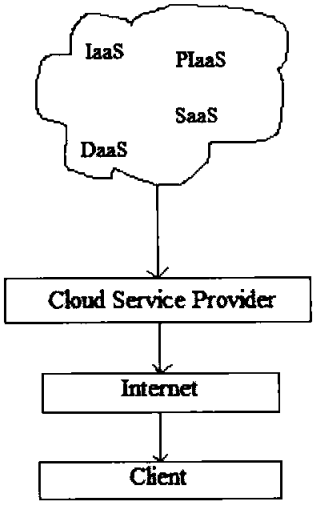


Fig 2 - Cloud Computing Services

5. Models of Cloud Computing

Cloud computing is considered as a third revolution of Information Technology after the revolution of Personal Computer and web technology/Internet. These revolutions have brought the great changes in the sphere of knowledge. Library is a place where the knowledge is to be stored and preserve for further use for next generations. So the utmost care is to be taken in its preservation. After the invention of paper, the knowledge in the form of written information has been preserve on it. However, with the emergence of PC and web technology, library professionals are now interested to put this knowledge in digitized form. Of course, developing required IT infrastructure for it and maintaining of it is an expensive affair for individual library. Cloud computing system is an option with library management for solving this guanine problem of library. Instead of maintaining this huge and eternally increasing knowledge locally in the computer, it can be put on cloud. Many options in the form of models are available for uploading the knowledge on cloud. Library can choose the proper one as per its convenience amongst the following models discussed in forthcoming paragraphs.

- **Private Cloud**

When the individual organization develops the cloud for its different services purpose and sections, it is

termed as Private Cloud. This kind of model is useful for large organizations such as University, Electricity Board, Railway, Bank etc. Generally in the individual organization for storing data and for other task, every section required hardware as well as software. Repetition in purchasing this infrastructure is observed in this process. In such a situation resource sharing in terms of hardware and software is possible through private cloud.

If University, large R and D department or other organizations develop their own cloud, the sections of these respective organizations can put their data on it. Library can avail the facilities of cloud, in case the cloud is developed by its parent institution. Security of data is the biggest problem in cloud computing. However, in case of private cloud as data is stored and maintained by the cloud of parent institution the problem of data security is solved in large extent.

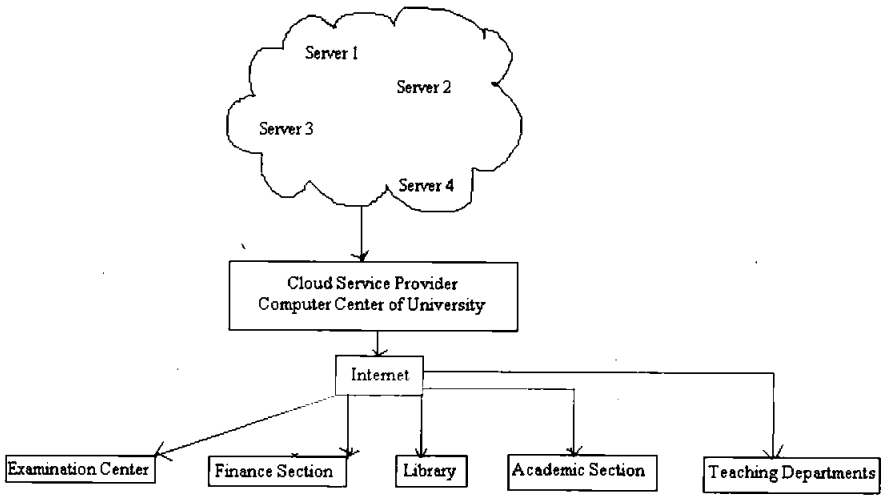


Fig 3 - Structure of Private Cloud

- **Public Cloud**

When the cloud service provider provides cloud services to the general public on Internet, then such a service provider is known as Public Cloud Service Provider and the model is called Public Cloud. Some of the typical examples of Public Cloud are given below.

- Amazon EC2 (http://aws.amazon.com/ec2/),
- Google App Engine (http://code.google.com/appengine/),
- Webfusion (http://www.webfusion.co.uk/cloud-hosting/),
- Rackspace Cloud (http://www.rackspacecloud.com/) etc.

Services offered by such a model may be free or pay as per usage. In certain cases cloud services can also be availed by paying periodical subscription. Libraries may also think to take the services of Public Cloud. The major benefit in this kind of model is that the library or its' parent organization need not to invest funds in purchasing hardware/software.

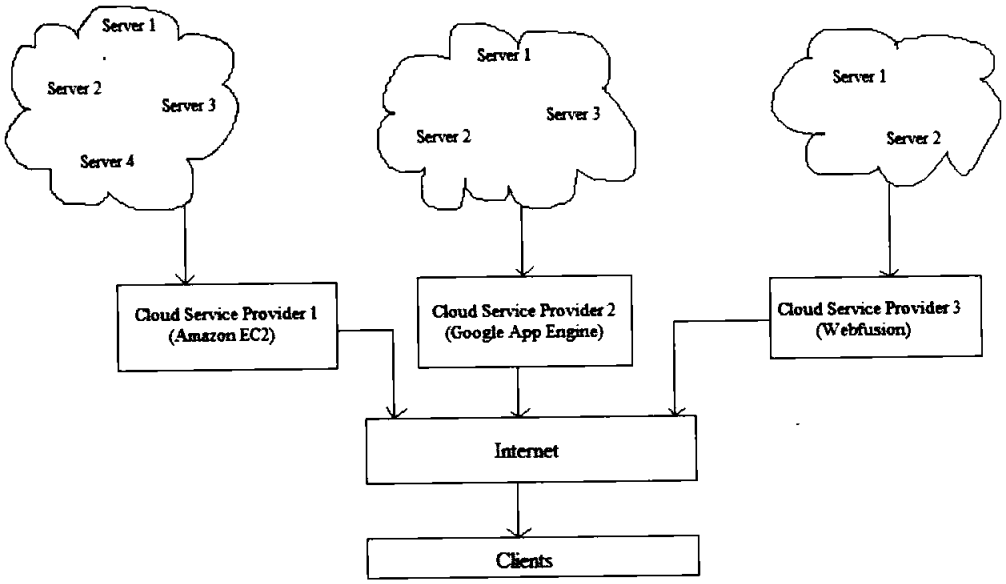


Fig 4 - Structure of Public Cloud

- **Hybrid Cloud**

Combination of Private Cloud and Public Cloud forms a Hybrid Cloud model. In this combination at least one Private Cloud and at least one Public Cloud are required. In hybrid model the individual organization manage its data along with infrastructure for its sections as Private Cloud and also extend the services to other organizations on their demand either free of charge or on payment basis. Amazon's Virtual Private Cloud (VPC) is one of the leading examples of a hybrid cloud.

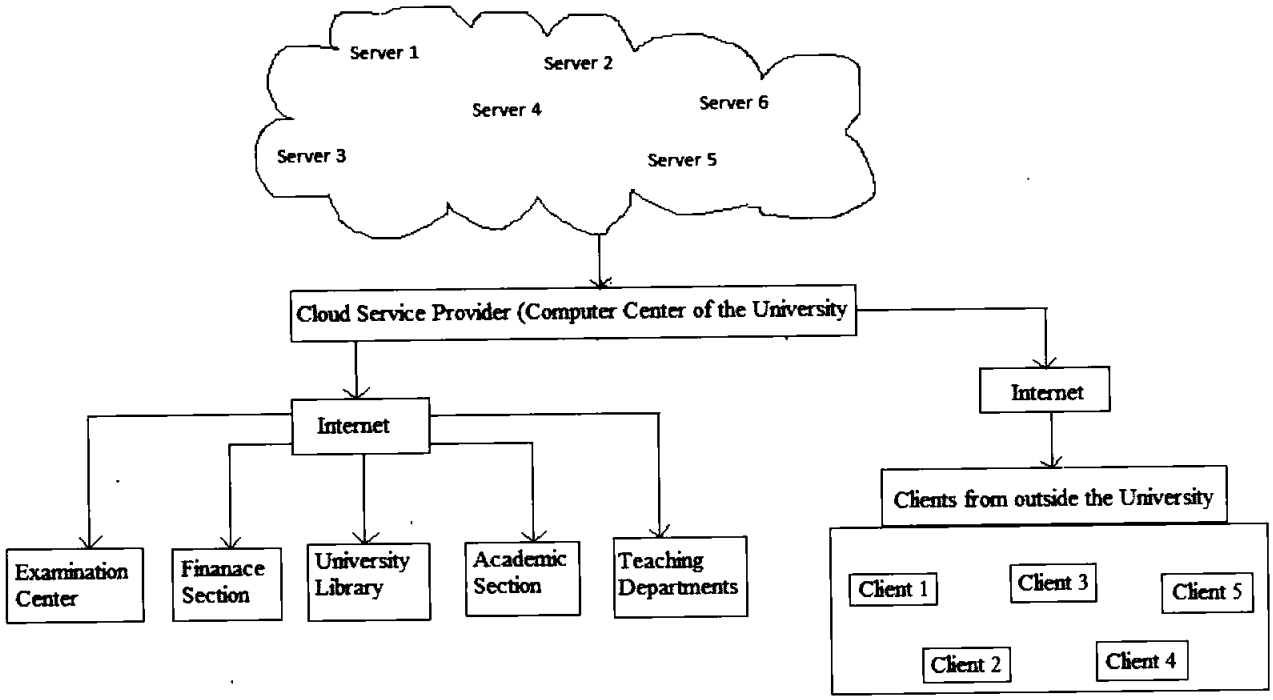


Fig 5 - Structure of Hybrid Cloud

6. Characteristics of Cloud Computing

ICT is playing pivotal role in the development of libraries in the World. Characteristics of cloud computing technology are attracting library professionals to make use of it in routine library house-keeping operations. Scalability, on-demand self service, broad network access, measurability are some of the major characteristics of Cloud computing technology due to which, it gets popularity amongst the professionals.

Changes in the services, digitization, up-gradation in existing or introduction of new hardware/software are the routine process carried out in the library. Cloud computing technology takes care of these changes and allows users (library management or organizations) to make request for these changes and also for additional bandwidth, storage space and speed. Such scalability is possible in this technology.

On-demand self service is another characteristic of cloud computing, in which being a customer library can request and manage its own computing resources. Cloud services are available on Internet. End users of the library can avail the library services and access required information through Internet from their destinations. Moreover library staff may also work for his/her library on Internet. The characteristic i.e. Broad network access allows for enjoying this facility.

The services obtained by the cloud service provider can be measured. Library can request for the additional band width for fast and smooth access of its information to the users, specific numbers of user license, space for storing the digitized information and so on as per the requirement. These requests of library can be measured easily to pay the service charges.

7. Area of library where Cloud Computing can be applied

Cloud computing is nothing but a collection of servers, sharing data and resources on a shared platform. It is a recent technology and still it is not commonly used. So far as libraries are concerned very few libraries in the World are involved in this technology. OCLC, Library of Congress etc. could be the examples of cloud libraries.

In digital library the storage of huge digitized data for dissemination is the major task to be performed by the professionals. It requires strong configured machines having adequate storage capacity. And as we know due to continuous and fast developments in ICT, new hardware and software with changing platforms are introducing day by day. It is very difficult for library managers to cope up with these technological changes with shrinking budget. Therefore, in near future libraries will be thinking to apply cloud technology in data storage area. Moreover, library databases, OPAC, Institutional Repositories etc. could also be put on cloud.

A well-stocked library is an asset to any academic and research institute. It has to play pivotal role in teaching-learning process. As library is the momentous ingredient of higher education in teaching and research, it should be sound in terms of academic resources as well as new technologies. It has to be acted as a 'Knowledge Resource Hub' to percolate the essential information up to end stakeholders. Moreover, these library stakeholders are expected from library that the adequate resources should made available at their work station/s. Further any single library can't fulfil the requirements of its stakeholders. With the help of other libraries (Member libraries) and cloud computing technology it can be done effectively. So far as cloud services are concerned, amongst these services SaaS and Daas can easily be used more effectively on co-operative basis. These can be adopted in following areas.

- Co-Web OPAC can be uploaded on cloud. Because of this our stake-holders get benefits for searching proper document/s form one place.
- Common library software can be used amongst the member libraries that can be installed on cloud.
- Regional/State Repository can be developed on cloud with the help of member libraries.
- E-learning process is possible through cloud.

8. Benefits of Cloud computing for library

- Cloud Computing promises to cut the operational and capital expenditure. Libraries need not to invest the money in purchasing of hardware and software
- In absence of hardware and software, no question arises about the maintenance of it.
- It cuts the time of library in the procedural work of purchasing hardware and software.
- It helps in improving the utilizations of the IT infrastructure to large extent.
- Digitized data storage problem may solve in great extent.
- Self sufficiency can be developed by fund raising activity through cloud computing.
- Sharing of databases is possible
- Library services can be made strong

Besides, on the part of library staff one major benefit can be quoted that for doing some library house-keeping task, the staff of the library need not to sit in his section of the library. He/she can perform these tasks from anywhere, where the Internet facility is available. Acquisition work and few library services can be extended by this way.

9. Hurdles of Cloud computing for library

Cloud computing system has many benefits. However, no system is full proof in the world and as cloud computing is in infancy stage, it has also certain drawbacks. As in other organizations the biggest hurdle in applying cloud computing in library is the data security. In cloud computing system, the data is to be handed over to cloud service provider in case of opting DaaS i.e. Data as a Service option. Cloud backup option is available to reduce this problem. Besides, Crypto cloud computing is also for securing cloud computing architecture. It helps to provide protection to data at the system level.

Besides, strong Internet facility should be available on the part of library clients. In case of interruption in Internet service, the clients can not avail the library facility. Further, if any technical problem arises on the part of cloud service provider and stop the services, then all the job of the organization/library will stop.

10. Cloud Computing Hosting Providers

Many cloud computing companies in the world are offering cloud services to all kinds of business organization, academic institutions and service organizations with variety of facilities. Interested library management can turn towards them and according to their demands and conveniences can choose the proper option. Under the sub heading 'Public Cloud' given above few cloud computing service providers are mentioned. Besides, following are also the Cloud Computing Hosting Providers offer services to their customers.

- Netmagic (http://www.netmagicsolutions.com/cloud-computing)
- GoGrid (www.gogrid.com/)
- Infosys (http://www.infosys.com/cloud/)
- Right Scale (www.rightscale.com/)
- TCS (www.tcs.com/)
- CA AppLogic (formerly 3Tera AppLogic) (http://www.ca.com)
- Zenith InfoTech (www.zenithinfotech.com/)
- Elastic Hosts – http://www.elastichosts.com/
- SiteCloud – http://www.sitecloud.com/
- Atlantic.Net (www.atlantic.net/cloud)

11. Conclusion

Library is a service institution. It is successfully shouldering the responsibility of disseminating the information and knowledge to all kinds of users including teachers, administrators, researchers, students since its beginning. Library professionals are always thinking to improve their library services. They have successfully applied the Information and Communication Technology in library for improving library administration, house-keeping jobs and services. Cloud computing is a new emerging technology and library professionals have an opportunity to use this technology in improving the library operations and services.

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Cloud Computing Technology and its Impact on Libraries

Parveen Kumar



Cloud computing and web collaboration are shaping twenty first century libraries and both the developments seem to be behind the newest developments in library services which are driving library automation. This paper discusses some of the basics of cloud computing with the aim of introducing aspects such as: challenges and risks of the model, types in the model, advantages and disadvantages of the model. Cloud computing is not an exception in changing the world. Cloud computing provides us virtually unlimited and on-demand computing resources. The study aims to provide a means of understanding the model and exploring options available for complementing the technology and infrastructure needs. It also highlights the libraries in the environment of cloud computing with their challenges/ security.



Cloud Computing, Cloud Models, Hybrid Cloud, Community Cloud, Private Cloud

1. Introduction

Cloud computing is a computing paradigm, where a large pool of systems are connected in private or public networks, to provide dynamically scalable infrastructure for application, data and file storage. In this technology, information is permanently stored on the internet servers and it can be cached by the users temporarily. The cloud application is created using resources from more than one service and from more than one location. It is a subscription-based service where a person can obtain networked storage space and computer resources. We can understand it with the example of a person's experience with email. If his email client is rediffmail, yahoomail, Gmail etc, and he want to access his email firstly, he opens the web browser then goes to the email client, and log in. The most important part of the equation is having internet access. His email is not housed on his physical computer; he can access it through an internet connection, and access it anywhere. At any place he can check his email as long as he has access to the internet. His email is different than software installed on his computer, such as a word processing program. When he creates a document using word processing software, that document stays on the device he used to make it unless he physically moves it. An email client is similar to how cloud computing works. Except instead of accessing just your email, you can choose what information you have access to within the cloud.

Cloud computing has large prospective for libraries. Libraries may put more and more contents into the cloud. Using cloud computing user would be able to browse a physical shelf of books, CDs or DVDs or choose to take out an item or scan a bar code into his mobile device. All historical and rare documents would be scanned into a comprehensive, easily searchable database and would be accessible to any researcher. Many libraries already have online catalogues and share bibliographic data with OCLC. More frequent online catalogues are linked to consortium that share resources.

2. Review of Literature

Padhy and Mahapatra (2012) describes in their study that the basic principle of cloud computing entails the reduction of in-house data centres and the delegation of a portion or all of the information technology infrastructure capability to a third party. Universities and Colleges are the core of innovation through their advanced research and development. Subsequently, Higher Institutions may benefit greatly by harnessing the power of cloud computing, including cost cutting as well as all the different types of cloud services. They also discusses problems faced with digital library and development efforts to overcome that problem. Sanchati and Kulkarni (2011) found in their study that cloud computing is still in the initial stage now, impacts brought by cloud computing are obvious. With the introduction of cloud computing to

university library, services of libraries will have a new rise in the near future. Services provided by libraries will become more user-centric, more professional and more effective, etc. The cloud computing techniques and methods applied to digital libraries, not only can improve the utilization rate of resources to address the imbalance in development between regions, but also can make more extensive use of cloud computing to our work life. Xiaona (2010) described cloud computing and analyzed the current status of user service models in university libraries. Then he proposed to improve current user service model with cloud computing and forward the bright prospect of user service models based on Cloud Computing.

3. Types of Cloud Computing

As a home user or small business owner, you will most likely use public cloud services. There are different types of clouds that you can subscribe to depending on your needs.

- **Public Cloud–** In public cloud a core infrastructure made available to and shared by many. It can be accessed by any subscriber with an internet connection and access to the cloud space. Its applications, storage, and other resources are made available to the general public by a service provider. For example the Internet and Public Switched Telephone Network (PSTN) etc.
- **Private Cloud-** A private cloud is established for a specific group or organization and limits access to just that group. It is cloud infrastructure operated solely for a single organization, whether managed internally or by a third-party and hosted internally or externally. Infrastructure can be on- or off-premise. It is built exclusively for a single enterprise. There are two variations to a private cloud:
    - On-premise Private Cloud: It is hosted within one's own data center. It is best suited for applications which require complete control and configurability of the infrastructure and security.
    - Externally hosted Private Cloud: It is hosted externally with a cloud provider, where the provider facilitates an exclusive cloud environment with full guarantee of privacy. It is best suited for enterprises that don't prefer a public cloud due to sharing of physical resources.
- **Hybrid Cloud-** Hybrid cloud is a composition of two or more clouds that remains unique entities but are bound together, offering the benefits of multiple deployment models. It combines both public and private cloud models. In this, service providers can utilize third party cloud providers in a full or partial manner thus increasing the flexibility of computing. Its environment is capable of providing on-demand, externally provisioned scale.
- **Community Cloud-** It shares infrastructure between several organizations from a specific community with common concerns i.e. security, compliance, jurisdiction etc., whether managed internally or by a third-party and hosted internally or externally.

4. Cloud Computing and Libraries

Libraries have been using some cloud computing services for over a decade. Online databases are accessed as cloud applications. Large union catalogs can also be defined as cloud applications. The library community can apply the concept of cloud computing to strengthen the power of cooperation and to build a significant, unified presence on the web. This approach to computing can help libraries save time and money while simplifying workflows.

If a person used any of the popular web 2.0 services over the past few years (e.g. Gmail, Wikipedia, Flicker or Twitter), then he already have some experience with cloud computing, since most of these applications are hosted in the large online data centers/ libraries that are the hallmark of cloud computing. Like water and electricity, a computing cloud is a communally-shared resource that you lease on a metered basis, paying for as little or as much as you need, when you need it. A brief list of potential areas of improvement could include:

Most library computer systems are built on pre-web technology.

- Systems distributed across the net using pre-web technology are harder and more costly to integrate.
- Information seekers work in common web environments and distributed systems make it difficult to get the library into their workflow.
- **Benefits of Cloud Computing in Libraries**
    - Cloud computing is the most cost efficient method to use, maintain and upgrade. It is available at much cheaper rates.
    - It allows us to customize our options with great ease. Hence, we can handpick just those services and software applications that we think will best suit our particular library.
    - This technology is user centric.
    - It is reliable and saleable and poses privacy concerns.
    - Since all the data is stored in the cloud, backing it up and restoring the same is relatively much easier than storing the same on a physical device. Hence, this makes the entire process of backup and recovery much simpler than other traditional methods of data storage in the libraries.
    - Improved resource utilization provides green and clean technology
    - If any library registers them in the cloud then anyone can access the information anywhere with the availability of internet connection.
    - Storing information in the cloud gives the unlimited storage capacity. It provides users with immediate access to a broad range of resources and applications hosted in the infrastructure of another organization via a web service interface.

Following effects of cloud computing will probably impact libraries and other sized organizations:

- **Cost savings:** Cloud computing offers price savings due to economies of scale and the fact that we are only paying for the resources you actually use.
- **Flexibility and innovation:** Libraries do not have to decide between devoting their limited server resources to the OPAC's overflow traffic and a new mobile web application that one of your colleagues wants to develop. If they are both hosted in the cloud, the resources devoted to each will shrink and expand as traffic rises and drops.
- **General IT skills:** System librarians have to manage complex projects and evaluate competing vendors on a variety of criteria. Holding vendors accountable is especially important when they manage a significant chunk of our online data and IT infrastructure. Therefore, as long as cloud security remains a significant concern, techies may be called upon to help write binding, enforceable contracts that hold vendors to certain standards with regards to reliability and security of their services.
- **Cloud OPAC:** Over the past year, more and more vendors have started offering cloud-hosted versions of their products. OCLC joined several other vendors last year when they began offering a cloud-based tool that complement their existing cataloguing tools (e.g. World Cat and First Search).

5. Cloud Computing Challenges/ Security

- **Data Protection:** Data Security is a crucial element that warrants scrutiny. Enterprises are reluctant to buy an assurance of business data security from vendors. They fear losing data to competition and the data confidentiality of consumers. In the cloud model, Service providers are responsible for maintaining data security and enterprises would have to rely on them. This could potentially put

your company to great risk. Hence, you need to make absolutely sure that you choose the most reliable service provider, who will keep your information totally secure.

- **Data Recovery and Availability:** All business applications have service level agreements that are stringently followed. Operational teams play a key role in management of service level agreements and maintenance of applications. In production environments, operational teams support:
    - Appropriate clustering and Fail over
    - Data Replication
    - System monitoring
    - Maintenance (Runtime Governance)
    - Disaster recovery
    - Capacity and performance management
- **Management Capabilities:** There is huge potential to improve on the scalability and load balancing features provided today. The Scaling offerings and maintaining sufficient performance is a challenge, especially for software as a service provider, who must deliver over networks and environments that they do not necessarily control.
- **Regulatory and Compliance Restrictions:** Many industries and countries disallow data or asset transparency. Also, some cloud providers have had outages with disastrous results, so trust remains an issue. In order to meet such requirements, cloud providers need to setup a data center or a storage site exclusively within the country to comply with regulations. Having such an infrastructure may not always be feasible and is a big challenge for cloud providers.
- **Federation and Interoperability:** IT functions typically automate a contiguous business process – and will thus require service integration among cloud providers.
- **Vendor lock-in and Data Management:** Data ownership in the cloud is not clear cut. Nor is the process by which data is to be reclaimed from cloud provider systems.
- **Technical Issues:** Though, it is true that information and data on the cloud can be accessed anytime and from anywhere at all, there are times when this system can have some serious dysfunction. We should be aware of the fact that this technology is always prone to outages and other technical issues. Even the best cloud service providers run into this kind of trouble, in spite of keeping up high standards of maintenance. Besides, we will need a very good internet connection to be logged onto the server at all times.
- **Prone to Attack** Storing information in the cloud could make your company vulnerable to external hack attacks and threats. As you are well aware, nothing on the internet is completely secure and hence, there is always the lurking possibility of stealth of sensitive data.

6. Conclusion

The cloud provides many options for the everyday computer user as well as large and small businesses. However, with this increased ease also come drawbacks. We have less control over who has access to our information and little or no knowledge of where it is stored. We also must be aware of the security risks of having data stored on the cloud. Cloud computing is one avenue for this move into the future. It can bring several benefits for libraries and give them a different future.

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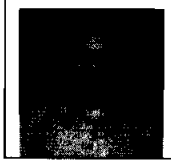
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Cloud Computing Technology: How can we use it in Library?

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Abstract

Cloud computing can transform the way systems are built and services delivered, providing organizations with an opportunity to extend their impact. This paper defines Cloud Computing and reveals how it is different and secure from other types of computing. The purpose of this article is to look specifically at how Cloud Computing can be employed by Librarians and what needs to be considered before moving into a Cloud Computing solution. It also discusses how Cloud Computing solutions could be beneficial to libraries in three basic areas: technology, data and community.

Cloud computing, Library cloud, Cloud security, Cloud technology.

1. Introduction

Cloud computing is a latest buzz all around with respect to web technologies and services. As web 2.0, this phrase is also being defined differently but the basic idea is almost same. In which users are getting web services on free or priced manner from service providers located at remote places. Cloud computing seems to be a new phrase but looking into the concept, we all have been using it since quite a long., e.g. email services of yahoo, Google, sify or others, YouTube and, Google Docs etc. are embedded with the 'cloud computing'. These services are free and we have also been putting important information on our email IDs, youtube, flicker, and now few social networks (face book etc.) where we have been sharing or shifting our personal information or data in different formats on the web. All these servers holding our information on the web can be metaphorically treated as clouds.

Practically, this is what cloud computing is all about – using other people's servers to run applications for our organization, remotely. *For example,* with cloud computing, we can run all our computer networks and programs as a whole without ever buying an extra piece of hardware or software.

2. Cloud Computing

It refers to a computing environment where there are little data and applications at the End User (EU) terminal. All the data and the applications that process the data reside on remote servers which can be accessed (securely) by the EU. All the data and applications can be imagined to be residing in a cloud; hence the name – **Cloud Computing**. Cloud-based services go far beyond delivering software. They offer a solution that's more flexible, scalable and available. And the combination of software, knowledge and work drives improved results for all providers and all organizations on the network. It's time to get on the cloud or be left behind.

3. Areas of Cloud Computing

Cloud computing is again still searching for an established definition but as of now it means using web services of others to satisfy users' computing needs, like – software applications, data storage and using different platforms to build needed applications. On basis of this cloud computing can broadly be divided in following segments:

- **Communication-as-a-Service ("CaaS")** allows for certain messaging tools such as-

  Voice over IP ("VoIP"), Instant Messaging ("IM"), and video conferencing.

- **Infrastructure as a Service ("IaaS")** is the delivery of computer infrastructure as a service that allows the customer to maintain owner and management of their application(s) while off-loading infrastructure management to the IaaS provider.
- **Monitoring as a Service ("MaaS")** is the outsourcing of security services to a third party security team.
- **Platform-as-a-Service ("PaaS")** is an application delivery model that is independent from the specific operation system it is running on it is meant to be only a web-based development infrastructure.
- **Software-as-a-Service ("SaaS")** is typically when a software vendor supplies software over a network as opposed to the typical distribution of installation on individual computers. For example- various open source solutions such as the Apache web server, database software such as MySQL and PostgreSQL, and virtualization software such as VMWare and Xen. Sun xVM VirtualBox, available free of charge, can virtualize software on a computer.

4. Advantages of Cloud Computing

If used properly and to the extent necessary, working with data in the cloud can vastly benefit all types of businesses. Mentioned below are some of the advantages of this technology: First, organization can save a lot of money; second, they are able to avoid the mishaps of the regular server protocols. *For instance*, when a company decides to have a new piece of software, whose license can only be used once and it's pretty expensive, they wouldn't have to buy software for each new computer that is added to the network. Instead, they could use the application installed on a virtual server somewhere and share, in the 'cloud'.Cloud Computing is very ideal for any library because of the following points as –

- **Cost Efficient:** Cloud computing is probably the most cost efficient method to use, maintain and upgrade. Traditional desktop software costs library a lot in terms of finance. Adding up the licensing fees for multiple users can prove to be very expensive for the establishment. The cloud, on the other hand, is available at much cheaper rates and hence, can significantly lower the Establishment's IT expenses [10]. Besides, there are many one-time-payments, pay-as-you-go and other scalable options available, which make it very reasonable for library.
- **Almost Unlimited Storage:** Storing information in the cloud gives almost unlimited storage capacity. Hence, library will have no need to worry about running out of storage space or increasing its current storage space availability.
- **Backup and Recovery:** Since all library data is stored in the cloud, backing it up and restoring the same is relatively much easier than storing the same on a physical device. Furthermore, most cloud service providers are usually competent enough to handle recovery of information. Hence, this makes the entire process of backup and recovery much simpler than other traditional methods of data storage.
- **Automatic Software Integration:** In the cloud, software integration is usually something that occurs automatically. This means that library does not need to take additional efforts to customize and integrate their applications as per their preferences. This aspect usually takes care of itself. Not only that, cloud computing allows the library to customize their options with great ease.
- **Easy Access to Information:** Once library register itself in the cloud, it can access the information from anywhere, where there is an Internet connection. This convenient feature lets the Establishment move beyond time zone and geographic location issues.
- **Quick Deployment:** Lastly and most importantly, cloud computing gives library the advantage of quick deployment. Once it opts for this method of functioning, their entire system can be fully functional in a matter of a few minutes.

- **High Availability:** Most cloud based services implement Continuity and DR (Disaster Recovery) solutions that back up the user data. This means that even if the primary server is down, or is brought down for maintenance, the backup system still serves the end users. Also, it is safe to assume that most cloud based services are run from world class Datacenters, thus minimizing the risk for any kind of downtime in the first place.
- **No need for an Antivirus:** As the data resides on service providers they implement security solutions to protect the data.

5. Disadvantages of Cloud Computing

In spite of its many benefits, cloud computing too has its pros and cons. While the technology can prove to be a great asset to any organization, it could also cause harm if not understood and used properly. Library need to be aware of these cons before going in for this technology [7]. The Risks Involved in Cloud Computing is –

- **Technical Issues:** Though it is true that information and data on the cloud can be accessed anytime and from anywhere at all, there are times when this system can have some serious dysfunction. Library should be aware of the fact that this technology is always prone to outages and other technical issues. Even the best cloud service providers run into this kind of trouble, in spite of keeping up high standards of maintenance. Besides, library will need a very good Internet connection to be logged onto the server at all times. It will invariably be stuck in case of network and connectivity problems.
- **Security in the Cloud:** Before adopting this technology, library should know that it will be surrendering all its sensitive information and resources to a third-party cloud service provider. This could potentially put the library to great risk. Hence, library need to make absolutely sure that it chooses the most reliable service provider, who will keep its information totally secure. *For instance,* from Sony to Google, various corporations have at various times come out in the open about their services being hacked and user data compromised. In a cloud based environment this threat takes on a whole new meaning as by definition cloud computing does not all any data including the most private and confidential documents to remain off the net!
- **Prone to Attack:** Storing information in the cloud could make the library vulnerable to external hack attacks and threats. As we are well aware, nothing on the Internet is completely secure and hence, there is always the lurking possibility of stealth of sensitive data.

These are just some of the benefits and limitations. One might imagine (and hope) that with times to come the list benefits gets longer and that of limitations loses some entries; however, for now it is safe to say that Cloud Computing hasn't matured to a level so advanced that all systems across the globe be shifted to this computing model.

Google plans to launch a **government-only cloud** this year to address government concerns about security and privacy. Just as companies presently cooperate with one another to buy IT equipment, bandwidth and the services of IT professionals, R&D organizations may soon cooperate in the building and management of data centers. Alternately, if enough R&D centres express interest, a company such as Google, Amazon, Microsoft or another cloud vendor might create a Cloud similar to Google's Government Cloud. Or, a cloud vendor with deep IT resources might build R&D-centric cloud services on top of cloud infrastructure leased from one of the more established players.

6. Intranet and the Cloud

Ironically, some Libraries use cloud computing to deliver their products & services over intranet. Intranets are customarily used within an organization and are not accessible publicly. That is, a web server is maintained in-house and library resources & information is maintained on it that others within the

organization can access. However, now intranets are being maintained on the cloud. To access the library's private, in-house information service, users have to log on to the intranet by going to a secure public web site.

Similarly, we can use the same sorts of principles within every library to develop its IT infrastructure. By setting up thin clients to run applications and services on a local server, rather than on their desktops, we can ease the costs of deployment and maintenance, as well as reducing power costs.

7. Cloud Components

In a simple topological sense, a cloud computing solution is made up of several elements: ***clients, the datacenter, and distributed servers***. These components make up the three parts of a cloud computing solution. Each element has a purpose and plays a specific role in delivering a functional cloud based application.

There are two main components in ***client/server computing:*** servers and thin or light clients. The servers house the applications which our organization needs to run, and the thin clients—which do not have hard drives—display the results.

- **Hypervisor Applications:** Applications like **VMware or Microsoft's Hyper-V** allow us to virtualise our servers so that multiple virtual servers can run on one physical server. These sorts of solutions provide the tools to supply a virtualized set of hardware to the guest operating system. They also make it possible to install different operating systems on the same machine. *For example,* we may need Windows 7 to run one application, while another application requires Linux. It's easy to set up the server to run both operating systems.

Thin clients use an application program to communicate with an application server. Most of the processing is done down on the server, and sent back to the client. Some thin clients require an application program or a web browser to communicate with the server.

8. Getting Library on the Cloud

There are scores of vendors who offer cloud services. What they have to offer varies based on the vendor and their pricing models are different, as well. Moreover, Cloud computing is a growing field, and there will likely be new players in the market in the foreseeable future. Let's take a look at some of the famous vendors of cloud computing – *Amazon, Google, and Microsoft.*

8.1 Amazon

Amazon was one of the first companies to offer cloud services to the public, and they are very sophisticated. Amazon offers a number of cloud services, including

- **Elastic Compute Cloud (EC2):** Offers virtual machines and extra CPU cycles for your organization.
- **Simple Storage Service (S3):** Allows you to store items up to 5GB in size in Amazon's virtual storage service.
- **Simple Queue Service (SQS):** Allows your machines to talk to each other using this message-passing API.
- **SimpleDB:** A web service for running queries on structured data in real time. This service works in close conjunction with Amazon Simple Storage Service (**Amazon S3**) and Amazon Elastic Compute Cloud (**Amazon EC2**), collectively providing the ability to store, process, and query data sets in the cloud. These services can be difficult to use, because they have to be done through the *command line.* Amazon's virtual machines are versions of *Linux distributions.* In fact, applications can be written on LIBRARY own machine and then uploaded to the cloud. Amazon is the most extensive cloud service to date.

- **Google:** In bare contrast to Amazon's offerings is ***Google's App Engine***. On Amazon we get root privileges, but on App Engine, you can't write a file in your own directory. Google removed the file write feature out of Python as a security measure, and to store data we must have to use Google's database. Google offers online documents and spreadsheets, and encourages developers to build features for those and other online software, using its *Google App Engine*. Google reduced the web applications to a core set of features, and built a good framework for delivering them. Google also offers handy debugging features. Groups and individuals will likely get the most out of App Engine by writing a layer of Python that sits between the user and the database. Look for Google to add more features to add background processing services.
- **8.3 Microsoft:** Microsoft's cloud computing solution is called ***Windows Azure***, an operating system that allows Libraries to run Windows applications and store files and data using Microsoft's datacenters. It's also offering its *Azure Services Platform*, which are services that allow developers to establish user identities, manage workflows, synchronize data, and perform other functions as they build software programs on Microsoft's online computing platform. Key components of Azure Services Platform include
- **Windows Azure:** Provides service hosting and management and low-level scalable storage, computation, and networking.
- **Microsoft SQL Services:** Provides database services and reporting.
- **Microsoft .NET Services:** Provides service-based implementations of .NET Framework concepts such as *workflow*.
- **Live Services:** Used to share, store, and synchronize documents, photos, and files across PCs, phones, PC applications, and web sites.
- **Microsoft SharePoint Services and Microsoft Dynamics CRM Services:** Used for business content, collaboration, and solution development in the cloud. Microsoft plans the next version of Office to offer a browser-based option so that users can read and edit documents online as well as offer the ability for users to collaborate using web, mobile, and client versions of Office. Microsoft is a little late to the cloud party and isn't a leader in cloud computing. Google and Amazon are leader in cloud computing, and more and more companies are offering cloud services. For some, the term "cloud computing" is simply hype. But for others who want to embrace it, cloud computing is a great way for Library professionals to focus less on their datacenters, and more on the work of library and information technology.

9. How Secure is the Cloud?

Of late, cloud computing has taken the IT world by a storm. More and more Libraries are migrating to the cloud instead of local storage. Not only is cloud storage cheaper and requires lesser maintenance, it also fosters greater collaboration and resource sharing capabilities [2]. It is good when data from these web based clouds is accessible to users but what will happen when we see any *cloud burst*?

While cloud-based services offer you increased visibility and flexibility, security is still the most important aspect of any Library Information System. Some library professionals may be reluctant to have information "out there" on the cloud; it is safe to say that cloud-based services offer distinct advantages in providing security.

- The ability to back up data at a secure location that's geographically separate from the primary location.
- The ability to apply a uniform, high level of security, privacy controls, and resources that can continually improve over time. By scaling security and control over an entire network, small library systems benefit from a level of investment that they would be unable to leverage on their own.

- A single, integrated database platform that makes information available without the risks inherent in mending together multiple information platforms.

Perhaps most important, a cloud-based network can offer a level of constant monitoring that's simply impossible with paper-based and client-server software models. Physical files can get lost or misplaced and there is little ability to determine exactly who has touched (or even altered) a document.

Both Google and Amazon are now offering attractive cloud services for library and business organizations. The service is extremely reliable—our resource is stored across multiple servers and can be seamlessly shared among all our patrons and staffs.

At this junction, with cloud computing on the rise, questions are being raised about security issues. For a start, any document stored on an internet/intranet, no matter how big or small, can be subject to malicious hackers. However, generally speaking cloud based storage has often been under the attack of tech critics claiming it to be an insecure medium for storage of data. Google and certain other cloud service providers have had their cloud of outages – however, this does not essentially make them less secure. **Cloud outages** are in no way more serious than traditional outages – the documents remain secure, only the server goes offline temporarily.

On the contrary, owing to such risks and security issues, most cloud based service providers take security as an important factor. Apart from **data redundancy**, providers such as Amazon also offer **data encryption** for enhanced security.

However, this is where as the end user, our decision comes into play. Of course, if libraries are opting for the cloud, chances are that they are doing it to minimize the cost of local storage – in other words, it does not make sense to use local storage for backups of our cloud resources [3]. In such a scenario, before we opt for a cloud-based storage provider, look for the backup offerings – chances are, they will surely provide nightly backups, in which our documents and transactions are backed up every day. But a wiser choice will be to opt for **incremental backup**, wherein our data is backed up after each transaction. Obviously, ***incremental backup provides to-the minute backup and is more reliable***.

In this case, usage of cloud computing cannot be discharged on account of security myths. Trusting on a cloud based service provider to secure our resources is much the same way as trusting a postal or courier company with our letters – we often place our important letters and parcels in their hands, don't we? A mere isolated event or mishap with the courier service provider cannot essentially be generalized as the overall measure of service offered by that provider.

It goes without saying that the future of data and resource storage is cloud storage. Most providers offer a secure product with encryption, redundancy and backups. This persistent dedication to optimal security and the attention paid to it over the cloud ensures peace of mind for library professionals and users.

10. Conclusion

We know that library is not only a knowledge ocean; its ultimate aim is to provide satisfactory services for all the people. Libraries have the opportunity to improve their services and relevance in today's information society. So in the new era, library should improve itself constantly by adding many new IT technologies. Cloud Computing is one avenue for this move into the future. It can bring several benefits for libraries and give them a different future.

Although Cloud computing can be seen as a new phenomenon which is set to revolutionize the way we use the Internet, there is much to be cautious about. There are many new technologies emerging at a rapid rate, each with technological advancements and with the potential of making human's lives easier. However libraries must be very careful to understand the limitations and security risks posed in utilizing these technologies. Cloud computing is no exception.

To increase the adoption of Web and cloud services, *cloud service providers* (CSPs) must first establish trust and security to alleviate the worries of a large number of users. A healthy cloud ecosystem should be free from abuses, violence, cheating, hacking, viruses, rumors, pornography, spam, and privacy and copyright violations. Both public and private clouds demand "*trusted zones*" for data, *virtual machines* (VMs), and user identity, as VMware and EMC3 originally introduced.

The cooperative effect of libraries using the same, shared hardware, services and data- rather than hosting hardware and software on behalf of individual libraries- can result in lowering the total costs of managing library collections and enhancing the both library user's experience and library staff workflows.

The vision is to use Cloud Computing to deliver library resources, services and expertise at the point of need, within user workflows and in manner that users want and understand. It should be free libraries from managing technology so they can focus on collection building, improved services and innovation.

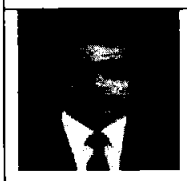
The Cloud Computing model will encourage libraries and their users to participate in a network and community of libraries by enabling them to reuse information and socialize around information. It can also create a powerful, unified presence for libraries on the web and give users a local, group and global reach.

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Cloud Computing- Thinking beyond Horizon

Ranjana Srivastava



Cloud computing, a latest rage in the computer savvy world and an altogether new and emerging internet technology offering innovative model is showcasing infrastructural IT resources "as a service" on demand by users without bothering for the hassles of storage and management problems. These services could be had from any part of the globe with accuracy, speed and convenience. Cloud computing has got an edge over archaic computer technology by offering improvement in cost structures and its ability to offer a quicker response to fast changing market scenario. In this paper discussions on various cloud computing service providing models based on infrastructural IT resources and the genuine need and reason for adopting these services and core issues enveloping clouds e.g. flexibility, scalability, security, privacy has also been made. With the emergence of cloud computing challenges of vertical scalability have also been thrown light upon.



Cloud computing, SAAS, PAAS, IAAS, Public cloud, Private clouds, Hybrid clouds, and Community clouds.

1. Introduction

Cloud Computing, with its inception since 2006 has become a buzzword and a latest rage not among the corporate and big business houses, research institutes, libraries but the common masses also like using face book, twitter, smart phone applications, online bank transactions or using IRCTC services for booking online railway tickets etc. with the advent of cloud computing age-old and archaic server centric application integration technology has become a thing of the past. Archaic server centric technology required expensive services of domain experts and software developers and it lacked the ability of using the computing power of the client system and storage capacity to its maximum limit. In the new concept of the clouds, software's are doing the role of service providers, outsourcing and hosting providers, network and IT infrastructure providers while adding the name of software companies contributing in the process of commercial boom in the internet world.

Faster reaction to the ever changing market demands and gradual cost reduction in providing services and thus cost reduction in productivity are the hallmark of cloud computing. Data of State of the Enterprise Cloud Report 2013, proclaimed "since January 2012 to June 2013, the use of cloud-based memory increased by 100 percent, and cloud storage by 90 percent".

2. Various packs of Cloud Computing

- **Service as a platform (SAAS):** In SAAS users could have software as service delivery over network as per requirement. Service as a platform is admired in cloud computing world for its easy to use model. Redeeming feature of SAAS being its application ready for running directly without any installation or downloads. There is absolutely no need for installation and running it on personal computers. Maintenance and continuous support for applications users are immense.
- **Platform as a service (PAAS):** PAAS offers computational resources through a platform. It is basically tailored for system administrators, developers, and testers. PAAS users are not needed to buy hardware and software's and using this platform development and deployment of customized software takes place. In this model networking, storage, virtualization, servers, middlemen and runtime are handled by the service provider whereas data and application are managed by consumers themselves.
- **Infrastructure as a Service (IAAS):** In this model cloud service consumers uses the facility of virtual desktop while consuming resources like resources storage, network, virtualized servers etc.

Using these services is chargeable and it all depends upon the actual use of the IAAS service. In fact IAAS service provider permits the user to use its IT infrastructure to install a virtual server. Characteristics and components of IAAS include:

- Utility computing service and billing model.
- Automation of administrative tasks.
- Dynamic scaling.
- Desktop virtualization.
- Policy-based services.
- Internet connectivity.

3. Types of Cloud Computing:

Cloud computing technology makes feasible interconnectivity of immense resources through the gateway of public and private networks. Infrastructure planning has become much simpler and easy and thus provides scalable infrastructure for cloud based applications, data and storage. Business houses have got an array of cloud computing services on Public, Private, Hybrid or newer Community Cloud to choose from.Enumerated below are the note worthy features of types of aforesaid cloud computing types to evaluate and choose the right cloud path for the organization:

- **Public Cloud:** Public cloud service providers hosting a cloud operate the infrastructure and offer access over the internet. Noteworthy feature of this model is sharing of same infrastructure kitty with finite configuration. Public cloud service provider provisions e.g. applications and storage to users over the internet. In this model cloud computing is publically accessible also. Public cloud computing service is offered by the service providers either free or pay-per-use model.
- **Private cloud:** Dedicated cloud infrastructures relating to organizations are known as private clouds. Private clouds permit only specified users to host applications in the cloud in a secure cloud based environment. Private clouds, within a virtualized environment, using underlying physical computing resources makes available computing power as a service. There are two types of private clouds.
- **Hybrid Clouds:** Hybrid clouds are a mix of clouds i.e. private, public which remains bound without losing its original characteristic and thus offering benefits of a wide range of deployment models. Flexibility of this variation is enhanced because of change in degrees of association of the third party cloud provider depending upon the need of the organization. In this variation organizations are to remain on toes in tracking the multiple cloud security platforms.
- **Community Clouds:** Community clouds are those clouds which are shared by various organizations having similar cloud requirement working together to achieve their business goals. Its management and governance is done commonly by the participating organizations or by a third party. In this model incurring costs span only on few users compared to a public cloud, but in any case higher than a private cloud.

4. Advantages of Cloud Computing

- **Cost effective:** Cloud computing is cost effective whereas using the proposition of traditional software development for the need of the organization by domain experts and developers and consultants took years and always remained a costly affair. Upfront costs of cloud computing are very reasonable and updates are never a problem.

- **Flexibility:** By using cloud computing, concept of working from office is gone. Working from any location remains the user's choice. With the result, network dependency i.e. using internet is more in vogue.
- **Speedy in response to unexpected business events:** After cloud deployment it remains the responsibility of vendor to take care of capacity and location planning and this results in quicker response from companies to unforeseen business changes.
- **Easily accessible latest updates of software's:** It remains the onus of cloud vendor to provide latest update of the soft ware's being used by the organization from time to time and without incurring any burden on the pockets of the consumer. This results in most modern user interface to cope with emerging business demands.
- **Providing cloud solutions is time savvy:** In providing cloud solution and roll it out takes couple of months whereas on-premise solutions requires years to be serviceable. Another plus point is reduced IT resources requirement for shaping a cloud solution and making it more profitable for the organizations.
- **Easy to adopt web based user interfaces:** Cloud applications can be had by the user company anytime and from anyplace using standard web browsers. Web styled interfaces are more easy to adopt without any need of specialized training. EBay and Yahoo are an example to cite with.
- **Addressing security concerns:** For all the companies data security is their prime concern and critics of cloud computing are always suspicious on this count. Placing data's outside internal firewall always remained a hot topic to discuss in companies opting for cloud computing. With the provision of strict ISO security protocol, cloud providers are bound to follow it, resulting in greater security of data's of cloud users.
- **Pay as you use and quitting easy:** Using cloud computing services requires less expenditure initially compared to on- premise solutions. Quitting is also easy in case satisfaction level is not good.
- **Virtualization:** Increased utilization, sharing of servers and storage is one of the key features of cloud computing. Migration from one server to another is quite easy.
- **Agility:** To make a provision of new computing resources took a considerable time. Cloud computing has enabled consumers to access computing resources using an on-demand self service interface as demanded by the user resulting in scaling up and down of the applications to give a response to external business forces than the need of IT procurement.

5. Risks in using clouds

- **Vulnerability testing reports:** Cloud service providers are hesitant to furnish vulnerability testing reports and often refuse to allow scanning for the fear of compromising their infrastructure.
- **Third Party Audit report of Cloud service provider:** Cloud providers usually don't welcome asking for the third party audit reports unless enshrined in the contract clause.
- **Excessive dependency on internet:** Basic drawback of Cloud computing is its dependency on the internet for accessing cloud and because of this dependency service interruptions and outages at any time always remains there to count for.
- **Difficulty in developing Hybrid System:** It's difficult to create Hybrid Systems of cloud computing. Big organizations holding sensitive information's normally have their inbuilt IT services and don't like to share it offsite despite the benefits of efficiency and performance.
- **Security and integrity of data's:** Security and integrity of data's hosted in- house remain at risk when we put it off site to take the services of cloud computing.

- **Sustainability:** The emerging problem with the use of cloud computing is phenomenal increase in the use of electricity and it is propelling us to the polluting energy sources instead of clean energy abundantly available today.
- **Over- concentration on a single service provider:** "Cloud computing is undergoing a seismic shift and is fundamentally shifting the economics of IT, of businesses and of delivery of governance, however the biggest hindrance that is stopping us from adopting cloud is the fear of losing control," said Bhaskar Pramanik, chairman, National Committee on IT, ITeS & e-commerce, CII & chairman, Microsoft India Corp. Pvt. Ltd. Innumerable users relying on a single service provider and subsequent overconcentration may cause failure in service resulting in catastrophe.
- **Infrastructural and Logistics concern:** For a healthy and secure growth of cloud computing environment it is imperative for cloud service providers to follow all relevant organizational information technology policies and possess capabilities essential for implementation and managing it. To name with, demand management, relationship management, data security management, application life cycle management risk and compliance management are those capabilities. Mushrooming of cloud computing providers lacking these capabilities is making a mess of the foolproof cloud environment.

6. Emerging trends in cloud computing

Cloud computing offering various models to users is evolving continuously to the changing needs of the small, medium and big business houses. User organizations prefer cloud services having big data analytics and application services on their platter for garnering big business gains.

- **Big data as a service:** Big data as a service appears as one of the most practical options for big data analysts as it is scalable and within the reach of the organization no matter its size or resources. Hadoop i.e. an open source software framework for storage and large scale processing of data's, set on clusters of commodity hardware, is being transformed by cloud service providers from an open source platform to an enterprise ready platform minus the need of a data scientist.
- **Hybrid cloud becoming a rage:** Gradually cloud computing has become a favorite choice of business houses. But the main concern is choosing the right kind of cloud service to adapt to. For meeting the ends of business and multiple business demands organizations are opting for a mix of public, private and IAAS clouds. Maintaining expertise on every cloud being used by organizations, tracking resources is quite a pain. So the organizations are placing their choice on Hybrid Clouds offering business solutions by a single service provider.
- **Performance oriented demand:** Presently the main concern of organisations is on the performance of the cloud. Earlier it used to be the security mainly. They are demanding reliable and break-free service with optimum performance. As the time goes now the trust level is also increasing and the companies trust the clouds with sensitive applications.
- **Lowering the playing field for SBM:** Small and medium business houses are also now getting the benefits of cloud computing at affordable prices. Cloud application protection technology permits the user to scan source code on their web application for any changes for detecting cyber attacks.
- **Cloud based application using game theory:** Gartner predicted in 2012 that by 2014, 70 per cent of Fortune2000 companies would have one cloud based application that uses game theory. Gamification is gaining popularity day by day. Increased consumer participation and increased access to behaviour analytics are the core benefits being enjoyed by the companies by adopting gamification.

7. National Policy for cloud computing in India

The India Vision 2020 document by the Planning Commission of India mandates that our vision of India's future should be both comprehensive and harmonious. It envisages that "By 2020, the people of India will be more numerous, better educated, healthier and more prosperous than any time in our long history." On demand net-work and services to be provided anytime and anywhere is attracting consumers from government and industrial organizations.

In an era of virtualization use of IT technology in government sector is fast gaining momentum and thus the choice of adopting cloud services is the need of the time. For India to become a major hub for offering cloud computing solutions there is a dire necessity of alliance between the government of India and industries both. Cloud computing is one of key area in the national IT policy.

Department of Electronics and IT, Government of India adopted an ambitious project termed as "GI Cloud" to enable the governments both centre and states to leverage cloud computing for effective delivery of e Services and set up a GI Cloud Task Force.
GI Cloud Adoption and Implementation roadmap talks about the GI Cloud Ecosystem and identifies major actors, their activities and roles. NASSCOM (National Association of Software and Services Companies) is hosting an open house between industry members and Department of Electronics and Information Technology to finalize the reports and collaborate further in this project.

The government of India has launched a national cloud initiative, Meghraj, to place government data's, services and applications to remote servers. Meghraj's target is to establish secure and unified cyber space for being shared by government services and infra structure, optimize utilization of IT resources on demand and utilization and IT infrastructure and resources to its optimum capacity. National Informatics Centre has been chosen in the first phase for implementing it, using its infrastructure, platform, software and storage as a service to cater the needs of government departments on a trial basis.

The working group headed by K. Gopalakrishnan has given recommendations regarding national IT policy to be adopted in India. Acc. to Mr Gopalakrishnan" Cloud computing is a way forward to bring affordable services in area like healthcare, education, e-governance and banking to masses.

Cabinet Minister Mr Kapil Sibbal has said recently "The National Cloud Policy would be announced soon. The security system would be installed within cloud environment while the delivery of cyber justice is imperative". The proposed National IT Policy whose one of the primary concern was cloud computing envisages to increase revenues of IT and ITES industries from USD100 billion at present to USD 300 billion by 2020. The members of the committee included representatives from the Department of Information Technology, National Informatics Centers, NASSCOM, industry chamber of CII, FICCI and others.

5. Conclusion

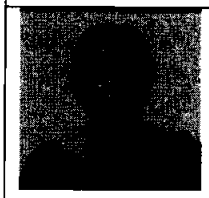
The future of cloud computing in India as well as abroad is very promising irrespective of certain snags in the nascent technology of cloud computing. Amid increasing use of the cloud market technology by small and medium businesses in the country it is expected to reach USD 685 million by 2014 according to a study by research firm Zinnov. "Public cloud market is expected to grow at 55 per cent CAGR (compound annual growth rate) in the near future and become a default choice for new IT investments, especially in the SMB segment" according to Director-Market Expansion Praveen Bhadada

Cloud computing successfully meets the challenge of temporary surge in demand of computer applications. Hallmark of the cloud computing system being It's cost effectiveness, flexibility, speedy response to unexpected business events, easy updates of software's, easy to adopt web based user interfaces. Virtualization is pulling the organizations to adopt this technology in a feverish pitch.

Security and integrity of data's , sustainability are the major concerns of cloud computing arena and is required to be addressed soon to win the confidence of user organizations. "It is imperative to make optimum use of IT infrastructure and reuse applications, since in a large country like India, we can't afford to have individual applications for all states. We have to adopt rapid deployment methods that we can measure and monitor," said Dr S. Satyanarayana, a noted cloud computing technology expert. The way cloud computing is progressing the day is not far that cloud services would become part and parcel of daily lives.

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Implementation of RFID at Indian academic libraries: *A survey*

Radha Alias Nagalakshmi



This study was conducted among the librarians who have implemented RFID at libraries in India to know the usage of RFID technology in academic libraries, to know the authentication of RFID technology in library, its issues and implications of the real users of the tagging system, and to identify the advantages and disadvantages of the RFID technology in library. RFID technology is applied to a variety of activities in libraries now a days like totally automated check in / checkout (without the intervention of the library staff), theft detection, stock verification etc. and comprises many components including RFID Tags/Labels, Library Staff Station, Security Gate, Self Service Units, Shelf Management etc. and it can be extended to many more areas in future. Being a new technology its potential is to be elaborated a little.



RFID, Academic libraries, survey, India.

1. Introduction

As its name implies, the term RFID is generally used to describe any technology that uses radio signals to identify specific objects. Typically, an RFID system consists of an RF device that communicates with a tag, which is embedded with a single-chip processor and an antenna. The RFID reader can be fixed or portable, much like the good - old barcode scanners. RFID tags are capable of storing and transmitting information. They vary in design and capability, depending on the manufacturer and their intended use. There are two types of tags which major in use are **Passive tags,** high frequency (approximately 13 MHz) and low frequency (around 125 kHz) systems typically have a read range of less than a meter. With HF and LF tag systems, the size of a tag has a significant impact on the read range. Some applications limit the read range to 15.2 to 20.3 cm. Some newer technologies (UHF systems) do have longer ranges of 6 to 8 m... **Active tags**, on the other hand, have a tiny battery for their power source, which results in an improved range of 30 m and better data handling. The reliability approaches 100%. The battery boost also allows for large memories (battery-backed SRAM as high as 128 KB), or additional sensory and data logging capabilities, such as temperature monitoring. This makes them suitable for longer-range applications such as asset locating. The battery and added circuitry make them more expensive than passive tags.

2. Objectives of the Study:

- To know the benefits and issues of RFID at academic libraries
- To identify the theft detection mechanism and self check in / out process
- To know authentication of RFID tracking system in libraries.
- To identify the practical problems faced in the new RFID technology.
- To know the users satisfaction and suggestion about the RFID at library.
- To know the actual time of conversion for implementing RFID in libraries
- To know the best practicing from the librarians who have already implemented RFID systems in their libraries at India.

3. Methodology

The data obtained in this research was based on the objective survey. Descriptive research was applied for a group of individuals and things. Data collection techniques adopted by Questionnaire method to collect the primary data from the librarians.

4.Scope and Limitations

There were many Institutions using RFID in their libraries for their regular activities like circulation, tracking, shelf management, stock verification and other library activities. However, this survey had been conducted only with selected academic institutions given like IIT, IIM, CIPET and top level Institutions at India and who have been successfully implemented RFID at their libraries.

5.Data Collections

Survey method used to ascertain information regarding the RFID usage in academic libraries. Questionnaire issued to the librarians who have implemented RFID at their libraries, to know about the implementation process, investment, benefits, issues, requirements etc... The questionnaire contained both open and closed ended questions to know the issues, advantage, benefits, frequency, cost of implementing the new technique, user satisfaction, theft control, stock verification, training and skills required to librarians, problems if any and solutions etc...

6.Survey Tool Used: Survey monkey http://www.surveymonkey.net/home/

7. Data Analysis and Interpretations

Table 1 - State Wise break up

Andhra	1
Assam	1
Bihar	2
Gujarat	6
J&k	1
Jharkhand	1
Karnataka	2
Kerala	1
Maharashtra	4
Meghalaya	1
MP	2
Orissa	1
Punjab	2
Tamilnadu	13
UP	3

The implementation percentage of RFID technology is more in Tamilnadu state followed by Gujarat then Maharashtra. The above table shows that in Tamilnadu there were 13 institutions which have implemented RFID and follows by Gujarat with 6 Institutions, and Maharashtra with 4 Institutions, Karnataka and MP with 2 institutions, and all others are having 1 institution. Total participated in the survey were 41 Institutions from 15 states of India.

Table 2 -Types of Institutions

Type of Institutions	Frequency
Deemed University	3
Government / Aided institutions	17
Government / Aided University	14
Private / Self finance Institutions	7
Total	41

From the above table, out of 41 institutions, 17 were from Government / Aided institutions and 14 from Government / aided university. And 3 were from Deemed universities, 7 institutions from private sectors. So it clearly shows that government uses RFID technology more than that of others. It may be because Government has more funds to go for new technology like RFID. The above data was given in the following diagram for more clarity.

Table 3 - Types of Library

Type of library:		
Answer Options	**Response Percent**	**Response Count**
Closed access,	4.9%	2
Open access.	95.1%	39

When compared for the type of library, from the above table it shows that 39 Institutions out of 41 have open access library, only 2 institutions have closed access. Hence the preference of RFID technology is more in open access library than the closed one. It may be because, RFID itself security system which control theft, easy tracking and self service, it may be best suited to open access library system.

Table 4 - Time frame for implementing RFID at libraries

Time frame for implementing RFID at libraries		
		Frequency
Valid	1 year,	18
	2 years,	3
	Below 6 months	16
	More than 2 years	4
	Total	41

The time taken for implementation of RFID technology at libraries was analyzed. 44% of respondents (18) said that implementation have taken place for one year, and 39% of the respondents (16) said it took below 6 months, and 10% (4) told that it took nearly 2 years and another 7% of respondent (3) told that it took more than 2 years. Naturally the time for implementing RFID is depends upon the collections of the library.

Table 5 - Benefits of RFID

Benefit of RFID	
Answer Options	**Response Count**
Improve efficiency	31
Improve productivity	5
Reduce operating cost	1
Reduce labor cost	4
answered question	**41**

o When there is a question of foremost benefit of RFID, 75.6% of librarians said that RFID implementation was improved the efficiency, 12.2% said that it improve the productivity of the library, 9.8% said it reduce the labor cost, and 2.4% accepted that it also reduced the operating cost of the library. It is clear that RFID technology is useful and beneficial. When the efficiency is improved, all the other factors will automatically improve.

Table 6 – Software's used for RFID

Software used for RFID Vs no. of Institutions	
Libsys	14
VTLS-VIRTUA	5
NewGenLib	5
SOUL	1
LIBTraze	1
Alice	2
SLIM21	1
Inhouse ERP	3
KOHA	4
Autolib	4
i-tek management Suite	1
Total	41

- As per the data collected, 14 institutions were using Libsys and 5 institutions were using Virtua (VTLS) , 4 Autolib, 4 NewGenlib, 4 using KOHA (OSS), 3 members were using their own in house software, 2 members were using Alice as software.
- And i-tek management suite, SLIM21, LIBTRAZE and SOUL were using by only one institution.
- From this survey it may be concluded that libsys seems to be one of the best software which can be easily interrogate with RFID solutions.

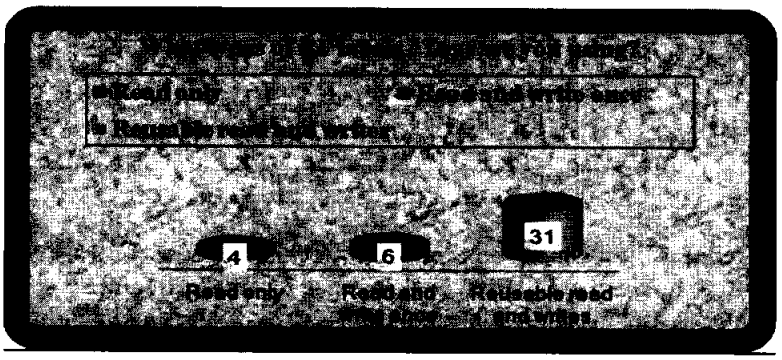


Fig. 1- Types of RFID Label used by the libraries

The analysis attempts to find out the types of tags used library. 75.6% i.e. 31 Institutions used reusable read and writes type of tag, 14.6% i.e. 6 institutions used read and write one and only 9.8% i.e. 4 Institutions used read only memory tag. Always reusable read and write tags are best for library management, so that additional data can be added to the tag at later stage or on expansion.

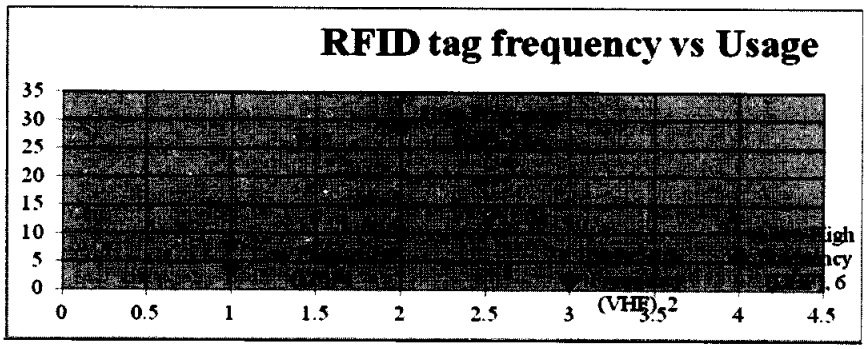


Fig. 2 - Frequency read range of RFID Tag:

According to the above table, 29 respondent out of 41 institutions having HF (high frequency) read range for RFID tag. It read about 13.56 MHz nearly about 1 meter of read range. Other read range may not suitable for library, but still 6 institutions using UHF, 4 Institutions using LF, and 2 institutions using VHF. It may be because of the product constrains and demands. Usually the frequency and the read range depend upon the RFID manufactures and hardware.

Table 7 – Type of RFID Tag

Type of tag used		
Answer Options	**Response Percent**	**Response Count**
Active	43.9%	18
Passive	48.8%	20
Semi active	7.3%	3
Semi passive	0.0%	0
	answered question	**41**

Many libraries (20) were used passive tag, where as 18 used active tags. Semi active tags were used by 3 institutions and none preferred semi passive tags. Since no power inside the passive tag, most of the respondent may prefer passive tags because it reading range is high and the life is more in passive than the active tags.

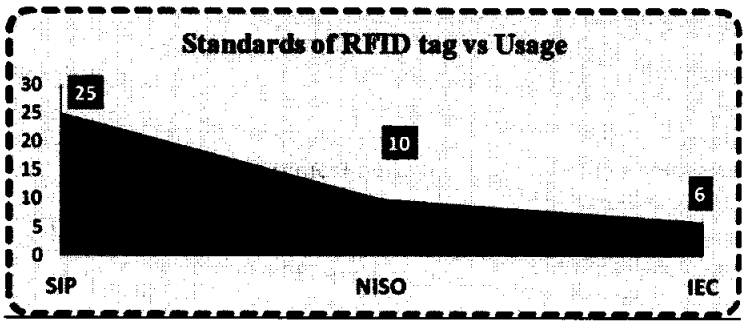


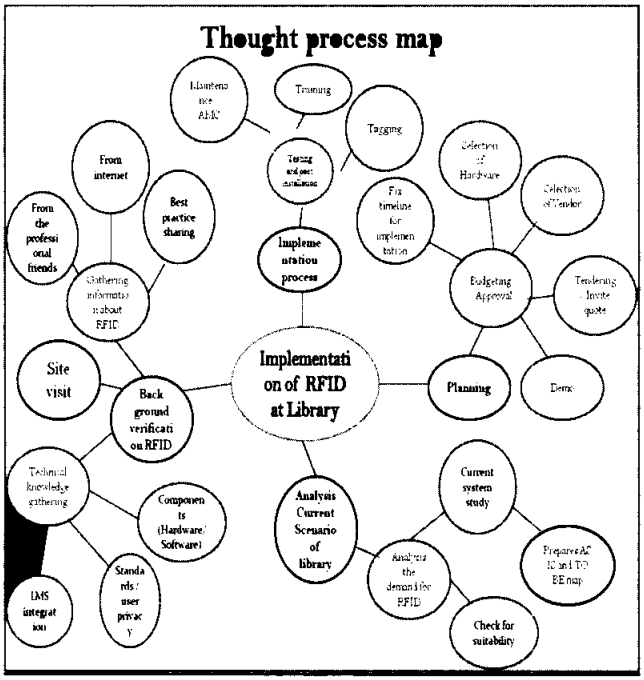
Fig. 3- Standards of RFID tag

The above table and figure shows that 25 institutions were using the **Standard Interchange Protocol** is a proprietary standard for communication between library computer systems and self-service circulation terminals from 3M technology.10 were using NISO (National Information standard organization) from ANSI, it has ISO standards for RFID communications as like ISO 18000, ISO 28560 etc...6 were using IEC **(International Electro technical Commission)** and it closely works with ISO and IEEE for standards

Table 8 Recommendation of RFID by librarians

Do you recommend the RFID to other libraries?	
Answer Options	**Response Count**
Highly recommended	16
Recommended	22
Not recommended	3
	41

39% of librarians were highly recommending the RFID technology, and 53.7% were recommended, so totally 92.7% were recommending this technology and remaining 7.3% were said it is not suitable for an academic libraries.



T-map

8. Major Findings

The below were some of the findings compiled from the my survey

- 66% of the respondents said they have tagged all the library materials with RFID tags, and remaining 34% have said they were not tagged non book materials like CDS, DVDS with RFID tags. So it clearly shows that we can reduce the investment by tagging only the circulating materials.
- The average cost of Tags is around Rs. 15 to 20 per unit. And high frequency tags were mostly used by the librarians.
- Materials like aluminum, iron should be removed. Should have Wood partition to avoid tag and reader collision
- Librarian should know about RFID components and the specifications clearly before installation.
- According to my study most of them getting the hardware of RFID from Malaysia, UK or from USA. So librarian should be careful while selecting the vendors of RFID and the components of RFID.

9.Suggestions and recommendations:

- Librarians should give the RFID implementation work only to the companies who are having proven record (i.e. already implemented in libraries. May ask for a letter for successful implementation from the concerned Library). Since most of the RFID vendors do not have sound support for service, choose the proven people to avoid future technology related issues.
- Kindly decide the required data to be programmed into RFID Chips and insists on data ownership (independence with Library Software). Also ensure the ideal environment of RFID Tags in order to extend the life time of Tags.

- Clean your database before starting. And Plan thoroughly, Convince and train your library staff
- Go for RFID only if you have very large transaction good to have it. Final call to be taken based on the necessity and affordability.
- It is a highly useful and essential service for every Library but we have to be sufficient smart and prompt to select this technology with a good library software because many good software's are introducing and available in low budget with more facilities in market.
- It is better to install CCTV Cameras in addition to RFID Gates. During the rush it may help for surveillance.
- Also, it needs to be assessing that how good technical support the vendor has rendered to its existing clients. How successful the implementation has been in libraries where the selected vendor claims to implement its RFID solution.
- The compatible of RFID solution with the existing library software needs to be ensured for a reputed company having experience in Library supply
- Before going for RFID implementation ask the vendor to demonstrate the inventory control system, if you are satisfied pls. go ahead.
- Requirement analysis based on facts and decides. RFID may not be required for a library with less than 100 users and remain open only during office hours.
- If the librarian has proper fund and technological strong then go for implementation of RFID.
- Proper electricity backup is most important for the RFID, should be noted before implementation.

10. Conclusion

It is quite clear from the above study that RFID system may be a comprehensive system that addresses both the security and materials tracking needs of a library. RFID in the library is not a threat if best practices guidelines followed religiously, that it speeds up book borrowing and inventories and frees staff to do more user-service tasks. The technology saves money too and quickly gives a return on investment. It is important to educate library staff and library users about RFID technology before implementing a program. It may be good for librarians to watch developments in RFID until the cost of tags comes down to Rs. 20 or less, the figure which some librarians have determined is the key to their serious consideration of it. While library RFID systems have a great deal in common with one another, including the use of high frequency (13.56 MHz), passive, read-write tags, lack of a standard and compatibility of tags produced by different vendors is a major problem in implementation of RFID in libraries. Current standards (ISO 15693) apply to container-level tagging used in supply chain applications and do not address problems of tracking and hot listing. Next generation tags (ISO 18000) are designed for item level tagging.

The newer tags are capable of resolving many of the privacy problems of today's tags. However, no library RFID products are currently available using the new standard. Thus librarian plays a major role in the implementation of RFID. So he should be aware of the technical specification of the hardware and the software of RFID before implementing. All new technology has advantage as well as disadvantage. Thus RFID too have both, but it is one of the good system to track the materials and for theft control at library. Even now it is recommended by all quality team like ISO, Bajaj and AICTE committee.

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M.I.S for management of automated library system

Mallikarjuna Rao, P

Abstract

The MIS features are immensely helpful to librarians for decision making in library administration. This paper deals with the meaning and definitions of MIS, its application for library management. Further it deals with the problems faced by librarians due to lack of such provisions in automated system. Some of the practical examples which forms the base for model of MIS module in a Library Automation Software. It also shows a solution by proposing to provide an exclusive MIS module in Library Automation Software (LAS). Further suggests the role of national professional bodies to set up Special Interest Groups (SIGs) to interact with the software developers.

MIS, Management-libraries, Library management.

1. Introduction

It is quite evident that the automated library system is a changeover of the conventional library system. There are immense changes in the form, nature and activities of the library. There is change in the type and nature of documents, type and nature of services provided; it calls for staff training and infrastructure, transformation, etc. The manager will have a challenging job of managing the change, thus it calls for 'management of change' on the part of management, especially when there is resistance or indifference on the part of the staff to adopt themselves to change, their antagonism or negative inclination towards updating themselves and adopting the technologies. The management will face a very tough time therefore management of change becomes an imperative part of library management in an automated system.

2. Change of environment in libraries

Advances in ICT have brought in tremendous changes in library operations, resources, services, staff and users. Libraries are confronting with the dynamic technological environment. The situation is demanding an extensive and effective use of ICTs in order to survive and meet the changing complex information needs of the user community. ICT is the driving force for future libraries, change is inevitable for survival and success of future libraries in changing technological world. The following are some of the major reasons for change in nature and functions of a library, Information Explosion, Information Communication Technology Revolution, heightened level of user expectations, new patterns of publishing scholarly communication, escalating cost of printed documents etc. are some of the main changes in library functioning. (Venkata Ramana, P, 2006;p1,2)

- **Change in library resources:** In traditional libraries, print material and manuscripts were the major resources and assets. Due to changes in printing and advent of communication technology, the electronic resources are becoming more significant in any library environment because of its easy, speedy, and remote access. The online resources are available on 24x7 basis. Hence, the users' priority in information seeking is changing from print material to electronic resources. Accordingly, there is a change in different library activities and services.
- **Change in library functions and activities:** The motto of the traditional libraries was getting as much information as possible into the library. In a modern library, this motto has transformed to lending (providing access) as many sources as it can, with the help of information technology. The manual operations like acquisition, cataloguing, serial management, circulation, binding functions are being performed with Library Automation Software. The change of functions are not only limited

to housekeeping operations, but also spread over to other areas which are not limited to library automation software. Identification of electronic resources, their accessing methods and techniques, conversion of print material to digital content, transfer and dissemination of information, network management, system administration, uploading of various digital content to different Internet sources for global access. Assigning of access rights, restrictions on access of certain resources, identification of subject gateways and open sources, developing institutional repositories, identification of user information needs in digital environment etc are the new priority areas of activity of the library.

- **Change in library services:** There is a considerable change in the nature of library services due to information technology. Cataloguing was replaced by data entry; manual catalogue cabinets were replaced by OPAC (Online Public Access Catalogue).The book lending services through register system, two card system, three card system was replaced by automated circulation system with barcode technology. These changes in the main functional areas and activities of the libraries have made inevitable change in management system. Consequently, the librarians and library managers also need to change and adopt the new techniques of management according to the needs and changing role of libraries.

- **Changing managerial role:** The change in the library functions and services has led to gross root changes in library management. The librarians should equip themselves with the following managerial skills to be successful in the new electronic environment:
  - Knowledge of information resources and services in electronic digital environment.
  - Develop specialized knowledge of access, Identification, process and dissemination of electronic resources.
  - Continuous Updating of knowledge on latest development of ICT.
  - Knowledge on use of latest technology in libraries.
  - Developing of creative ideas to introduce new services with the application of IT.

2. Management of change in automated library systems

The changes in the nature of Library resources, functions and services of a modern library made inevitable change in Library management. The management has become system oriented. Earlier in manual system the managers used to depend on files, registers, records, reports etc. for various management activities, but in automated system the management became technology based. Technology replaced the manual system. The application of computer techniques in libraries makes the management more accurate, speedy and improve the efficiency of various tasks and functions of the library. In an automated system of library, the manager / chief librarian need not go to different sections of the library to supervise or to evaluate the staff or a particular section performance. The technology enables the administrator remote observation or controlling. The manager can communicate his ideas, plans, orders, and decisions in a speedy way by the means of various electronics communication systems like fax, e-mails video conferencing and through Social networks like blogs, twitter, and orkut in automated system. The following are some of the examples for technology based management.

The I.T has brought tremendous change in management of library in an automated system. Almost all the manual housekeeping operations like acquisition, cataloguing, serial control, circulation, binding, cataloguing etc. were converted to Library Automation Software (LAS). Apart from the housekeeping operations covered in Library Automation Software, a number of other technologies are also taking place in libraries they are RFID technology, surveillance cameras in library security, biometric system for attendance and reporting timings, stock verification, barcode, hand scanners for shelf rectification etc. are some of the examples of application of latest technologies in library management. In order to face the above said change of technologies, the library should follow the application latest management techniques for tit's management.

3. Modern management techniques for libraries

As a result of R&D in management, a number of new methods and techniques came into light for application to various problems faced in management. To name a few, system analysis, system design, planning, performance evaluation, performance measurement. Analytical techniques, Management Information System (MIS) are some of the latest management techniques. (Kumar,P.S.G, 2003;p335) Though, MIS is one among such management techniques, in view of the background of the present study, the suitability and applicability of MIS technique for library management is dealt in the following lines.

4. Management Information System (MIS)

It is a system approach for scientific analysis in management of organisations that are complex in nature. Library Management is also a complex one because it needs knowledge of general management and also technical skills in Library and Information domain. Hence, a library management is a complex one and the MIS is suitable for library management. The main purpose of MIS is to design and develop Management Information System for decision making. "The MIS is a group of people, set of manuals for selecting, storing, processing and retrieving data to reduce the uncertainty in decision making by providing right information to managers at the time they can most efficiently use it" (Shalini Urs, 1999;p7).

The concept of MIS is mainly based on three components viz Management, Information, System.

- **Management:** Management has been defined in a variety of ways, but in view of the MIS, it comprises the process or activities that describe what managers do in the operation of their organisation: plan, organise, initiate and control operations. They plan by setting strategies and goals and selecting the best course of action to achieve the plan. They organise the tasks necessary for the operational plan, set these tasks up in to homogeneous groups, and assign authority delegation. They control the performance of the work by setting performance standards and avoiding deviations from the standard. (Robert G. Murdick 1993 p5,6).Because decision making is such a fundamental prerequisite to each of the foregoing processes. The job of an MIS becomes that of facilitating decisions necessary for planning, organising, controlling the work and functions of the business.
- **Information:** Information consists of data that have been retrieved, processed, or otherwise used for informative of inference purposes, argument, or as a basis for forecasting or decision making. An example here would also be anyone of the supporting documents already mentioned, but in this case the data could be used by an internal auditor, the management services department of an external auditor or internal management for profit planning and control or for other decision making purposes. (Robert G. Murdick 1993 p5,6)
- **System:** System is a set of elements, people, things, concepts, which are related to achieve a common goal. A system is an organized complex of whole; A system is an organized unity, so designed that a predetermined purpose is attained through inter-dependence, regular interaction, and integrated functioning of its diverse parts. The parts of the system work in a coordinated manner. The above attributes of a system are befitting in the case of a university Library having various sections with a common goal, and needs regular interaction and cooperation among various sections to achieve the common goals of university.

5. Management Information System (MIS) in libraries

Management Information System is one of the most useful systems for the management of library and information centers. The MIS provides required accurate and pinpointed information to the administrators within a short time span which helps for quick decision making. MIS is the most potential area where there is wide scope for research and application in library management. There is no fully automated MIS mechanism in support of decision making for chief librarians and top level administrators of library and Information centers in Indian conditions. In India, most of the University and academic libraries

are automating their functions with the help of different library automation software. In fact, there is a lot of difference between automation of library housekeeping operations and MIS technology in libraries. It is observed that there is a gap of knowledge in the area of automated library management for decision making support system.

In view of the changing demands for integrated technologies in LAS, the present paper is aimed to study to what extent MIS features are available in the LAS for the purpose of library management. The study also attempts to find the problems faced by the library managers in the absence of such features and seeks opinion of the librarians on having all such management features as MIS module at one place.

6. MIS features in Library Automation software

Improving the library services and thereby attaining higher levels of user satisfaction depends on efficient management in the libraries. The Management in turn, depends on Management Information System or Management Information support service/ system. Every decision making process needs sufficient data relating to the functions, processes and services in the organization. The administration needs data / information about the collection, finances, technical processing, staff and staff performance, user needs and their attitudes, satisfaction, etc. for taking necessary decisions for improving the conditions, facilities, performance and services of the library.

Ever since libraries started automating their operations, they have also made provisions for maintaining data/ information required by the management for proper administration of library. This is evident from the very basic fact of incorporation of 'Reports' in most of the library software. Recent advances in managerial sciences evolved sophisticated managerial techniques, tools, system for management. It is for the librarians to apply such techniques for library management in an automated library management system, where the decision making takes a vital role for efficient management of the library.

MIS forms an important system or component in every library to deal with the organizational statistics and any other information to support the management. Though MIS has become popular in western countries, still it is not used in many libraries. In India, it is still in infancy, and is beeing maintained in the form files and registers. The reports incorporated in library software can almost be equated with MIS component, but it is not the MIS of the library system.

In this context, there is a need to study of management features in different software used in the libraries, so as to understand to what extent of these features are available and useful to the administration. The amount of information, type of information provided by different modules varies from one software to an other. In some software there may not be exclusive 'Reports and queries' module, but still they provide data/ information to the management in other functional modules. The following are some of the examples selected out of 85 features identified for study. The features were randomly selected module wise to create a model for developing MIS module.

- **MIS (Reporting) features in acquisition module:**
  - Number of books ordered over a particular period.
  - Dept. wise expenditure on purchase of books.
  - Percentage of books supplied by a vendor against the order. (Vendor performance).
  - Number of books passed on to Technical section over a particular period.(staff performance)
- **MIS (Reporting) features in cataloguing module:**
  - Number of books catalogued over a particular period of time. (Staff performance).
  - Number of books catalogued by a particular person. (Staff performance).

- **MIS (Reporting) features in circulation module:**
  - Number of books issued Dept. wise over a particular period.
  - Number of books borrowed by teaching faculty over a particular period.
  - Number of books sent for binding over a particular period.
  - Number of new registrations in an academic year.
- **MIS (Reporting) features in serial control module:**
  - Number of journals subscribed in a year.
  - Amount spent on journals Dept. wise.
  - Report on total expenditure on journals.
- **MIS (Reporting) features in database:**
  - Total number of records in data base.
  - Number of records language wise.

7. Problem facing in access MIS features in LAS:

The above mentioned features are some of the examples of MIS features in Library Automation Software. All these features were spread over in different functional modules. Most of the features are implicit or partial in giving data or information, because they are meant for functional module not for MIS reporting, in other words they are giving data indirectly with an effort to search with two or three clicks or to open other windows other than presently working. Where as MIS module provides exact data on desktop with a click of mouse. For all these to happen, all these reporting features should be made available at one place as exclusive MIS module.

In the initial stages the perception of library automation is nothing but computerization of library activities. Developing integrated software was a tough task and hence, modular software was developed to deal with acquisition, cataloguing serial control, etc. this shows that, right from the beginning the developers of LAS gave more emphasis on automation of the house keeping operations. Even in developing LAS the application of standards, conventions etc. that form the base for the library activities are ignored, as the software engineers who developed the Library Automation Software are not well acquainted with the library practices, standards and conventions. The due importance was also not given to library professionals while developing Library Automation Software. Now this is the time to integrate all these technologies in Library Automation Software. Therefore, there is a need to study all these aspects and also to which extent these features are useful in providing necessary data/ information to the administration.

8. Study conducted

Accordingly a study is conducted in 11 universities in Hyderabad. A scheduled questionnaire is distributed among the library professionals working in 11 universities. The main aim of the study is to explore the availability of management features in the selected library automation software, that are widely used, viz. SOUL, Libsys, Newgenlib and VTLS. Responses of the professionals using these software in the 11 university libraries regarding the availability of MIS features in their software were analyzed. There are 144 professionals working in the 11 university libraries, out of which 119 are actively involved in the use of software in their libraries. Out of those 109 (91.6%) have responded to the study. based on the analysis of the data the following finding are presented.

9. Findings:

- A total of 85 MIS (Reporting) features have been identified as essential for library management and **only 34 of them are available in common** in all the four selected software.
- Two of the 85 identified features are not available in any of the four selected software. They are: 1. Amount collected on over dues, 2. Reminders (Circulation) sent over a particular period.
- The remaining 49 features are scattered in the four selected software that means, some are available in certain software, while some other features are available in other software.
- Basing on the availability of features, VTLS is ranked 1 as it has 74 (87.1 %) out of the 85 features identified. New Genlib and Libsys have shared 2nd rank with 61 (71.8%) features each and the SOUL is at rank 3rd with 49 (57.6%) features available.
- Responding to a query on 'problems faced due to lack of MIS features', it is stated that:

  About 48.6% respondents stated that they are facing problems due to lack of management features, and suggested to incorporate 47 additional MIS features mentioned by the respondents that they are facing problems or need to be incorporate in different modules of their LAS.
- Responding to another question on need for developing an exclusive MIS module in indigenously developed LAS it is stated that:

  A considerable majority of 85% of the respondents stated that there is a need for developing an exclusive MIS module in indigenously developed LAS. The above study ravels the need for R&D on developing an exclusive MIS module to integrate in indigenously developed Library Automation Software.

10. Conclusion

Hence, it is suggested that, the national professional bodies like ILA should initiate to set up Special Interest Groups (SIG's) to communicate or to discuss the above problems with the software developers on several deferent topics of R&D to integrate deferent technologies in to Library Automation Software to establish standards and conventions of LIS to Library Automation Software.

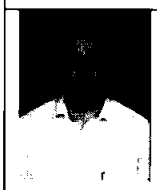
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Need to Convert Academic Library in to Library 2.0

Parmar Amita Bipinchandra



Library service evolves with the advent of new technology. Possiblities of harnessing we based services are immense. Library 2.0 is a concept borrowed from web 2.0. In other words, Library 2.0 technologies re mostly web 2.0 technologies. This paers attempts to describe library 2.0 technologies with concept, characteristics and need to convert today's academic libraries in to library 2.0 tools and techniques.



Library 2.0, Web 2.0, Library 1.0

1. Introduction

Academic libraries include college and university libraries. Commonly referred as research libraries, they are often used by students as a quiet place for study and research. The same user, behavior is common to most academic libraries. The collage libraries has deal with information resources in variety of formats and attempting to select the most appropriate and economically viable formats for proving access to information in their libraries.

There has been a more change in the academic libraries due to the revolution e-resource era, the networked information and access to information resources rather than holdings have become the order of the day, all over the world academic libraries besides, individuals subscribe electric journals to meet their expectation. Therefore, the new digital era has become rise. Nowadays our academic libraries are going towards library 1.0 to library 2.0.

2. Concept of Web 2.0

"Web 1.0 took people to information; web 2.0 will take information to the information." **Ian Davis** .It is observable that the information environment within which libraries find themselves changing is probable faster than ever before. These changes offer great opportunities for progressive libraries to reach walls of buildings and websites and to engage with an increasingly interactive literate body of information consumers. Similarly, the techniques and technologies that have enabled these new developments are also suitable for consumption within our libraries, to enhance the way in which we make our data work for our visitors and ourselves. At this juncture, library 2.0 service, motivated towards the needs and expectations of today's library user.

The heart of library 2.0 is user-centered environment. It is blending at Web 2.0 and library developing to library 2.0. Web 2.0 is a newer mode of web based interactive service than the web 1.0. Web 1.0 is a retronym, which refers to an advanced state of the World Wide Web, which was developed by Timothy Berners-Lee in 1989. It commonly means any website design style used before the advent of the web 2.0 phenomenon.

Web 2.0 was first conceptualized and made popular by Tim O' Relly and Dale Dougherty at O'Relly media in 2004. The term is now widely used and interpreted different ways, but web 2.0, essentially, is not a web of textual publication, but a web of multi-sensory communication. It is a matrix of dialogues, not an accumulation of monologues. The technology of web 2.0 is utilized in library service that encourages constant and purposeful change, inviting user participation in the creation of both the physical and the virtual services. They want, supported by consistently evaluating services.

Web 2.0 is qualitatively difference from prior web technologies has been challenge by www inventor Tim Berner –lee, who called the term a "piece of jargon"-precisely because he invented the web to embody these values in the first place.

3. Library 1.0 To Library 2.0

Library 1.0 is really whatever point we are at present. The students, we are serving now are the students that we have served for a considerable time. The reality is that the number of users who have needs is out-numbering than those whose needs we are meeting. In other words, we are offering services that are not wanted by majority of our population. (Students).

Secondly, a library 1.0 is the current activity cycle of planning and implementing. We often prepare and plan for years, but when these plans are put into place and executed we have a tendency to walk away without performing constant follow-up.

Library 1.0 is a restrictive place, governed by strict hierarchies, rigid boundaries and under planned by change- avoidance. Library 1.0 is striving on collections and superficial services through the outline environment, where as library will perform the full suited of library services through the online as well as electronic medium.

4. Basic Characteristics

Library 2.0 is a model for library service that encourage us constant and purposeful change, inviting user participation in the creation of both- the physical and the virtual services they want, supported by consistently evaluating services. It also attempt to reach new users and better serve current once through improved customers-driven offering Library 2.0 can be characterized – which are essential elements-by the following.

- It is user-centered: User participate in the creation of the content and services they view within the library's web presence, OPAC, etc. The consumption and creation of content is dynamic and thus the roll of librarian and user are not always clear.
- It provides multi-media experience: Both the collection and services of Library 2.0 content video and Audio components. While this is often cited as a function of library 2.0, it is here suggested that it should be.
- It is socially rich: The library's web presence includes user's presence. There are both synchronous (e.g. IM) and asynchronous (e.g.Wikis) ways for users to communicate with one another and with librarians.
- It is communally innovative: This is perhaps th single most important aspect of library 2.0. It rests on the foundation of libraries as a community service, but understands that as communities change, libraries must not only change with term and they must allow users to change the library. It seeks to continually change its services to find new ways to allow communities not just individuals to seek, find and utilize information.

5. Library 2.0- To facilitate Academic Environment

Library 2.0 is not about searching but finding; not about access, but sharing. Library 2.0 recognizes that human beings do not seek and utilize information as individuals, but as communities. Some examples of the move from Library 1.0 to Library 2.0 includes...

Library 1.0	Library 2.0
Email Reference/ Q & A pages	Chat Reference
Text based tutorials	Streaming media tutorial with interactive databases
Email mailing list, Web-masters	Blogs, wikis, RSS feed
Controlled classification schemes	Tagging coupled with controlled schemes
OPAC	Personalized social network
Catalog of largely reliable print and electronic holding	Catalog of reliable and suspect holding, web-pages, blogs, wikis, etc.

6. Library 2.0 Examples

Many examples that might be considered aspects of a library 2.0 approach exist and innovators around the world continue to demonstrate that witch might be possible.

- **Remixing Library Services**: The delivery of library service within the library building or simply from a library's own website is shifted to offer services to those who come to us, to reach the beyond the boundaries of the library space or to people where they are already interacting. For example, new technologies and new attitude make it eminently feasible to break the OPAC down into a set of functional components, to make each of those components available web, weather; library focused or not. As a result, the OPAC become far more widely available and consequently for more valuable.
- **Information Easily Discoverable:** Exploring basic information about the institution and its services, the open library should seek to enable discovery, locating, requesting, delivery and use of the resources in its care. For example, physical library holdings might usefully become far more visible then they are now. OCLC has made important progress in this area, and their OpenWorldCat initiative allows searchers to find books held by participating libraries in popular search engines such as Google and yahoo.

7. Libraries seek participation

Library 2.0 facilitates and encourages a culture of participation, drawing upon the perspective and contributions of library staff, blogs, wikis and RSS are often held up as exemplary manifestations of web 2.0. A reader of a blog or a wiki is provided with tools to add a comment of even in the case of the wiki, to edit the write web. Library 2.0 is about encouraging and enabling a library's community of users to participate, contributing their own views on resources the have used and new once to which they might wish access.

8. Conclusion

Library 2.0 is change; it is of a nature close to the tradition and mission of libraries. It enables to access to information across society, the sharing of that information and the utilization of it for the progress of the society. Library 2.0, really, is merely a description of the latest instance of a long standing and time tested institution in a democratic society, the library 2.0 changed the concept of tradition librarianship. The library and information professional should cope up with the new technology.

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Attitudes of Undergraduate Students and Teachers towards Library Services through Social Networking Sites: A Survey of Library Users in Birbhum District, West Bengal

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Abstract

This paper aims to find out the urge of the undergraduate students and teachers as well towards the inclusion of a SNS to their college library web pages. To this purpose a survey research was conducted among 500 students and teachers from five degree colleges in Birbhum districts, West Bengal. A questionnaire was used to gather information on the use of SNS and the respondent's approach towards the library services through SNS. Both the students and teachers are found to be very much eager to have a popular SNS linked to their library web pages.

Information and Communication Technology, Web 2.0, Social Networking Sites, Library web page

1. Introduction

If you want to retrieve or share information in a friendly and fun environment SNS is one of the best alternatives for you. SNS are the products of Web 2.0 technologies that have transformed the static "read only" web pages into dynamic and interactive web pages one. Or its interactive feature communication from both ends is possible. Users can share their ideas, thoughts; provide suggestions and comments on any topic of their interests. Almost every every student and teacher of the modern day world spends a lot of time using SNS, maybe it is for chatting to their friends and families or for seeking information for academic pursuit.

The use of SNS by libraries, both academic and public, is on the rise around the globe because they have felt the pulse of the modern day technology savvy users. College libraries in WEST Bengal in this regards are far behind the expectations of their patrons and they need to adopt new technologies to adjust their operations to suit the changing demands of the patrons.

2. Objectives

- To feel the attitudes of the students and teachers towards the SNS, if linked to their library web pages.
- To find out the purpose of the use of SNS by teachers and students of colleges in Birbhum district.
- To find out the most popular SNS among the students and teachers.
- To have opinions from students and teachers on having a SNS linked to their college library websites.

3. Benefits of SNS for Libraries

A library may derive the following benefits from using a social media like Face book, Twitter, LinkedIn, MySpace etc.

- To announce the upcoming events or programmes of the library,
- To inform the patrons about the new arrivals in the library collection,
- To notify the new services,
- To teach basic search tools,
- To provide reference service,
- To facilitate effective communication between librarians and the patrons
- To make the resources of the library available to the patrons from any part of the globe and at any time,
- To serve distance education students,
- To reduce costs of staffing etc.

4. Methodology

A questionnaire was distributed among 500 students and teachers of five degree colleges in Birbhum district, West Bengal. Only 475 questionnaires were received. So, the study is based on the data gathered from 475 respondents.

Table 1-Data about Respondents

Categories of Respondents	Number of Respondents	Percentage (%)
Male Students	175	36.84%
Female Students	230	48.42%
Male Teachers	49	10.32%
Female Teachers	21	4.42%
Total	475	100%

The sample studied for this survey comprised of 405 students of which 175 are males and 230 are females. The rest 70 respondents are teachers comprised of 49 males and 21 females. Based on the questionnaire the following five tables have been given under different headings and accordingly analyzed.

Table 2-Data about use of SNS

Categories of Respondents	No of Respondents	No. use SNS	No. do not use SNS	% using SNS	% not using SNS
Male Students	175	167	8	35.25	1.67
Female Students	230	221	9	46.53	1.89
Male Teachers	49	48	1	10.11	0.21
Female Teachers	21	19	2	4	0.42
Total	475	455	20	95.89	4.19

Table 2 shows that among the 175 male students 167 (35.25%) use SNS whereas 8 (1.67%) do not use SNS. Among the 230 female students 221 (46.53%) use SNS whereas 9 (1.89%) do not. There were 70 teacher respondents. Among them 49 were males and 21 were females. 48 (10.11) male teachers take interest in SNS while only 1 (0.42%) does not have any interest in SNS. 19 (4%) female teachers were found to be interested in SNS and 2 (0.42%) does not take any interest in SNS

Table 3: Data on Popular SNS

SNS	Respondents	Percentage (%)
Face book	425	93.41%
Twitter	16	3.52%
LinkedIn	4	0.88%
Face book & Twitter	5	1.1%
Flicker	3	0.66%
Academia.edu	2	0.44%
Total	455	100%

Table 3 shows how popular Face book is. Out of455 respondents 425 (93.41%) use Face book while 16 (3.52%) use twitter. The other SNS are not worth mentionable.

Table 4: Reason for using SNS

Reason for using SNS	Respondents	Percentage (%)
Talk to friends and relatives	315	69.23%
Information seeking	80	17.58%
Make friends	33	7.25%
Community buildings	27	3.93%
Total	455	100%

Table 4 shows the purpose of using SNS. 69.23% respondents use SNS to talk to friends and relatives, 17.5% use it for information seeking, 7.25% use SNS to make friends and 3.93% uses SNS for community building.

Table 5: Data on demands of accessing library services on SNS

Library services on SNS	Respondents	Percentage (%)
Yes	464	97.68%
No	0	0%
Not sure	11	2.32%
Total	475	100%

Table 5 shows something interesting. In Table 2 we found that 20 persons did not show any interest in using SNS. But when they were asked whether they wanted to get library services through SNS, they all showed their interest in using SNS. So, the percentage of users who wants library services through SNS increases to 97.68% while only 2.32% is skeptical about such mode of library services.

Table 6: Demand for library services on SNS

Library Service	Respondents			Percentage		
	Yes	No	Not Sure	Yes	No	Not Sure
Interacting with the Reference Librarian	475	0	0	100%	0	0
Accessing Library Catalogue	475	0	0	100%	0	0
Links to recommended websites	475	0	0	100%	0	0
Announcement to library programmes	475	0	0	100%	0	0
Information on New Title	475	0	0	100%	0	0

Table 6 shows another very interesting fact. In table 5, 11 respondents were not sure about accessing library services through SNS. But when they were asked about particular library services like Reference Service, library catalogue online, announcement of library programmes and information on new title their doubts were gone and they could not answer but 'yes' and all the 475 respondents showed their interest in accessing library services through SNS.

5. Major Findings

- Face book is the most popular SNS among the college students and teachers.
- Most of them presently use SNS for talking to friends and families. A considerable portion uses it for information seeking also.
- If library service is provided through SNS, a large number will come forward to use it and they will accept it as a great opportunity.

6. Conclusion

The above discussion has established the fact that students and teachers are very keenly interested to use the platform of Social Networking for accessing library services. The introduction of this innovative service will add value to the diminishing library profession. Librarians will have the opportunity to promote their library's services with minimum expenditure of money and manpower. Librarians must equip themselves with all the necessary ICT skills to satisfy their patrons. The situation of college libraries in Birbhum district of West Bengal is very frustrating one. At present most of the libraries are run by contractual staff or Group C

or Group D staffs who have no training even of diploma level. In some cases the college has a website but the library has none of its own. After a long five or six year the government has started the process of recruitment of permanent librarian. Hopefully the situation will improve very soon.

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QR Codes and Libraries

Amith Mittal **Arvind Mittal**

Quick Response (QR) codes may be new to libraries, but in reality they are nearly two decades old. Apart from storing a large amount and variety of information, their wider applications are due to their easy generation and use. No special hardware or software is required. A layman with little knowledge of the internet and mobile can easily produce and use these codes. The best thing about these codes is that a number of experiments about their use can be done. Different statistical information can be obtained by tracking these codes. These QR codes are taking place in libraries also. Application of these codes in the libraries provides a easy access of information to the users. The librarians should go ahead with the codes.

Keywords: QR codes, Quick response codes, 2D codes, Applications in libraries, generation, scanning and tracking.

1. Introduction

The "QR" in QR Code stands for "Quick Response" - which is a great way to sum up how these codes became so popular. QR codes are a kind of two dimensional barcodes. The QR codes follow an international standard (ISO/IEC18004) (Walsh; 2009). Each QR code is a black square box having three black square boxes in the upper left, upper right and lower left corners. The rest of the barcode is made up of a black and white pixilated pattern which holds the encoded data. These Codes are a kind of barcode that can be both created and used simply with a smart phone. These barcodes can be scanned by using an 'app' on smart phone. Often these 'apps' are free and easy to download. On scanning the QR code is done with a smart phone's camera, the barcode is decoded and the data within it gets displayed. This ease of storing and retrieving data/information has made these little squares so popular. Rather than having to write down or remember information, snap the code with a smart phone and have access to the data in moments. The main convenience of these barcodes is the accessibility to digital information even without being in front of a computer; these codes can even be found on websites. When found online, the purpose of these codes is often for interlinking websites with other online profiles or being used for some type of promotion.

A QR code can hold a large amount of data (up to 7089 characters) and perform many functions which other two dimensional barcodes cannot do. It can not only store text, e-mail addresses, phone numbers, web addresses or even general notes, but they can also perform functions on smart phones, such as send a text message, open up a browser window or even make a phone call.

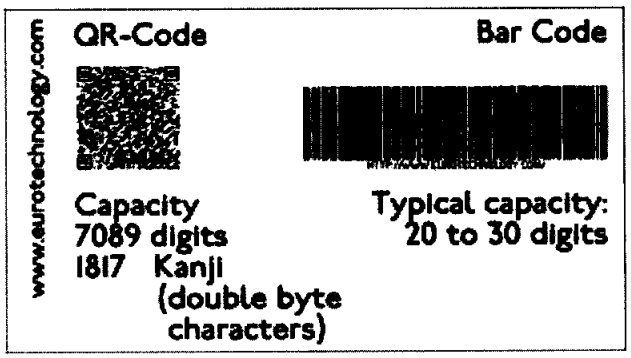


Figure 2: Capacity of QR code

2. How to Make a QR Code:

Generating a QR code is very easy. No programming or other technological skills are required; one only needs the ability to use the internet. There are number of sites on the Internet where online QR code generators are available even free of cost. These free QR codes generators are almost very similar. They allow the user to choose the type of data they want to embed inside the code. Some of them even provide the facility to customize the colour. The QR code generation is just a three step activity-

- **Step One: Choose a QR Code Generator:** A simple search on any search engine yields many QR code generators, but it is up to the user which one to choose. Most of the QR generators use the same technology and produce the same results. However, there are some generators which are better than others due to the vast amount of options they include for creating a QR code. For the best result, make a QR code with a number of different generators to see which features are required.
- **Step Two: Choose what to entre in the code:** A QR code can store thousands of characters of data. It can store a variety of data like- text, website links, message in alphanumeric, e-mail addresses, geographic locations and even many more things. It not only stores the data but can also perform on the data like making a call, opening the web link or sending a message to the phone number or email addressed stored in it. Encoding of latitude and longitude into a QR code is also possible. These coordinates can launch the users' preferred mapping program, such as Google Maps, to show the location and directions to get there. All these items can be combined to provide contact information, often called a "VCard".
- **Step Three: Create a QR Code:** After choosing content and a generator, the next step is to make a QR code. First of all enter the data to be encoded into the generator and click "Ok". The generator will show your QR code very quickly. All that's needed to use the QR code is to save it as an image. Some generators will have a link to download the QR code, but if it is not there, simply right click on the image of the code to save it. Before adding the QR code to anything it's important to test it by downloading a QR code reader and attempting to scan the code. A proper QR code is scanned quickly and promptly shows the results. If the code isn't being read properly, try to create it again or try with another QR code generator.

3. How to Read QR Codes

For reading a QR code, a smart phone with a free downloadable QR code scanner app is required. Nearly any smart phone with a camera having an application can be used to scan QR codes. These applications can be found by searching for "QR code readers" or "QR code scanners" in a smart phone's application store or directory. There are a number of open source QR code libraries which results in a large number of free QR code scanner apps. Some popular examples are the "QR-DROID" app for Android and "RedLaser" for Apple products. Smart phone's camera with the app can be used to scan the QR code; the app will decode the pattern of the barcode and display the results. QR code scanners decode the data inside a QR code by reading its pattern. Two patterns in particular are contained within a QR barcode: a finder pattern and an alignment pattern.



Figure 3: QR code reading with smart phone application

The finder pattern is made up of three symbols of a square within a square placed in the corners of the barcode. These squares help the QR code reader detect the size, angle and direction of the barcode. Another, smaller pattern of square makes up the alignment pattern which determines if the QR code is on a surface which is distorting it and corrects for that distortion if possible. By reading these patterns and analyzing the difference between the black and white areas of the code, a QR code scanner can decode the data inside of it and display it to the user in a format that they will understand.

The software behind QR code readers is truly remarkable. With a built in error correction of up to 30% and the ability to compensate for non-flat or reflective surfaces, smudging and even text or images embedded within the code, QR codes prove to be very durable. This combined with being low cost and easy to use makes it clear that QR codes and QR code scanner apps have incredible staying power.

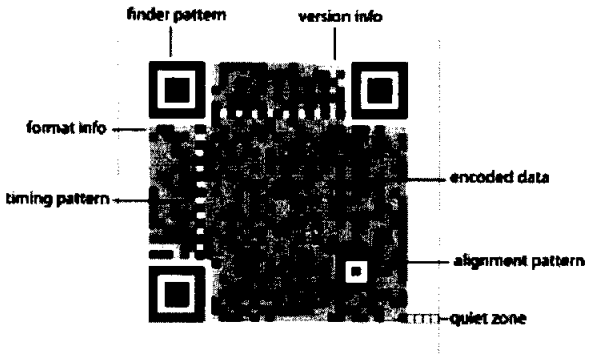


Figure4: Parts of QR code

4. Tracking of QR Codes

Tracking QR codes is a one can not only see how often a particular barcode is being scanned, but how long users are viewing the content, where they're viewing it from, and even more. For tracking a QR code, create a QR code with a generator that includes a tracking feature. Tracking can come in many forms when coupled with a QR code creator. Some of the generators provide the facility of basic statistics like how many times the QR code was scanned. Others advanced QR codes may include the features like the geographical location of scanning and even the duration for which the contents were viewed. Complex QR code creators may also give detailed reports and graphs. These generators and the features they offer come in a variety of range.

5. Application of QR codes in the libraries

The librarians need to adjust their philosophy of librarian as guardian and disseminator of information. The Internet has permanently changed the role of librarians. Students want to feel connected to and involved with the information; they are more social now than ever before. Librarians need to encourage this type of interaction between information the library provides and the users. QR codes are a means of encouraging this type of interaction (Whitchurch; 2011) Librarians and staff in large Libraries are experimenting and discovering useful ways to implement QR codes in both their physical and online libraries. "Library Success: A Best Practices Wiki" has a QR Codes page and is the place where librarians and others can share and link to how their libraries are using QR codes. Many value-added services to the users can be provided using these codes. QR codes are the way to integrate digital and physical world (Harris; 2010). QR codes can be used in the libraries in the following ways-

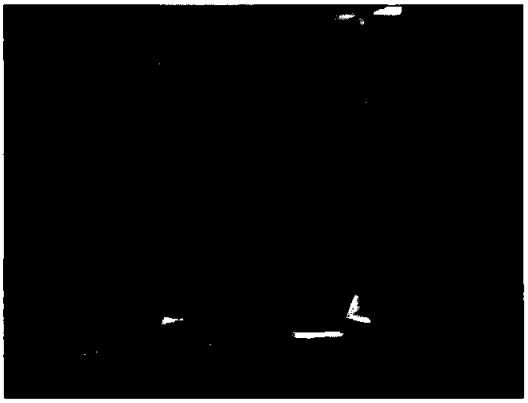


Figure5: Application of QR code in Libraries

- **Library Exhibits:** Library exhibits that include a QR code link to songs, videos, Web sites, surveys, contests, posters, bookmarks etc. or other information that augments the exhibits.
- **Library Guides:** These Codes can be pasted on the library stacks, in the magazine/journal areas where it points to online electronic holdings of print materials or related subject guides.
- **Library Signs:** the codes can be used as signs which give the directional information about the location of particular service or collection.
- **Library Orientation:** Linking the QR Codes to library audio tours for orientations.
- **Information about the Library Holdings:** Code added to print handouts for additional information on mobile friendly sites.
- **Reference Service:** QR code can be linked with the online reference service and other contact information into the patron's phone.
- **Searching of Documents:** Catalog record and basic information of the documents including the location can be added in the codes, this helps the users to directly scan the code and head to the stacks rather than writing or printing.
- **Trailer of the AV materials:** QR codes pasted to video/ DVD cases, linking to mobile-friendly video trailers help the users to know the contents even without getting it played.
- **References:** Code placed on staff directory pages and research guides that go to mobile friendly sites for later reference.
- **Interviews and Reviews:** Code placed on audio book cases for author interviews or books for reviews.
- **Reservation of rooms:** Code placed on study room doors connecting to room reservation forms.
- **Publicity of the library:** the virtual video/audio tour of the library or information about the products or services helps in marketing.
- **Library Tutorials:** Library video tutorials on YouTube playlists of videos linked to the QR code, which create a great mobile home screen app, can be saved for easy access, as needed.
- **V Cards:** the information about the library staff, their telephone directory can be linked to the code.
- **Tracking:** the QR codes can give the information regarding the number of times a particular code get scanned or the location from where it was scanned and even the duration for which the contents are viewed. This may be helpful in providing various kinds of statistics to know about the usage of the particular item/service.

- **Current Awareness Service:** Librarians can add the current awareness list to the QR code or web link to the code printed on the monthly brochure of the library.
- **Selective Dissemination of Information Bibliographic Services:** the subject bibliographic details or web link to the code is also helpful.
- **Indexing/ Abstracting Services:** indexes or abstracts added in the codes are helpful for the readers in saving their time and even prevent them from printing or writing them down.
- Apart from these there are number of other areas where these codes can be used.
- **E-books:** QR codes can also support the ever-evolving environment of e-book access in libraries, where, as an example, one could go further and share an entire eBook and even multiple pieces of content that share a common link (Massis, 2011).

6. Implementation of QR codes in Libraries:

In order for libraries to stay relevant, librarians must implement the technologies that users routinely employ in their daily lives (Balas; 2011). According to Whitchurch (2011), while implementation of QR codes in their libraries, the librarians should keep in mind that-

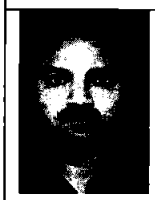
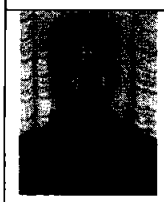
- Use the codes only when the implementation will add value to the experience of the user.
- Using QR codes for the sake of the technology is seldom a good reason.
- Modify the codes with colours or images to be customized to your institution.
- Provide as much education as you can about QR codes, including how to use them and how to install a reader.
- Simply using the codes effectively is a great marketing tool.
- Start with temporary signs and move to more permanent signs as the implementation becomes more permanent.
- Experiment and be creative with different uses to find those that work better. This requires that usage of the codes be tracked.
- Codes are cheap and easy to produce. Adapt existing codes to how they are used.
- Just because one implementation is not used does not mean that QR codes are not worthwhile or effective. Try another project until you find implementations that work well in your environment.
- Have fun with the codes and broaden the possibilities of how to use the codes to help students engage with the library and content provided.

7. Conclusion

To conclude the QR codes have wider applications over the simple bar codes. They are finding their ways in all the fields- manufacturing industries, marketing, retail market, institutions and even libraries. The best thing about the QR cards is that these are easy to generate, use and scan, for all these; no new technology or skills are required. The library staff with small training can generate these codes and apply them in the library. These codes can be experimented in almost all the library services/operations.

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Quick Response Code and Libraries

Sanjeev Dutt Sharma **Vyas Kumar Bajpai**

Abstract

This paper deals with the concept of QR Codes, types of QR Codes, available standards for QR Codes, essential Hardware/Software, and its relevance for the libraries. The paper presents the basic overview about the QR Codes Technology for a layman.

Quick Response Code, Q R Code, 2-D Code, Two Dimensional code, Second Generation Code.

1. Introduction

We in the library fraternity are aware of the barcode technology because whenever we think about the barcodes, an image of vertical black bars with spaces comes in our minds. These barcodes are variously known as the First Generation Barcode or Conventional Barcodes or One-Dimensional (1-D) barcodes which stores information horizontally.

With the advancement of Information Technology, a new concept of barcode technology has emerged, i.e. Quick Response (QR) Code. QR code is also known as the Second Generation Barcode or Matrix Barcode or Two-Dimensional (2-D) Barcode. In comparison to the conventional barcodes QR codes can store information both horizontally and vertically. As a result, the amount of information that QR codes can store is much greater than the conventional barcodes.

2. QR Code

2.1 History

The QR code system was invented in 1994 by Toyota's subsidiary, Denso Wave. Its purpose was to track the vehicles during manufacture. It was designed to allow high speed component scanning. Initially QR codes were used for tracking the parts in vehicle manufacturing and nowadays QR code are being used in a much broader context, including both commercial tracking applications and convenience-oriented applications aimed at Smartphone users.

2-D codes can hold a larger amount of data in a smaller space, and compared with other 2-D codes, the QR code can hold much more data. In addition to this QR code has an advanced error-correction method and other unique features allow it to be read more reliably and at higher speeds than other codes.

All barcodes are designed to be read and decoded by computers, using machine-vision features consisting of Optical Laser Scanners or Cameras and barcode interpreting software. The rules for constructing the barcodes and the character set it uses are called its *symbology*. There are two types of barcode symbologies:

1. One Dimensional (1-D) or linear
2. Two Dimensional (2-D)

1-D barcode are being used in our libraries for issue-return of books or commonly seen on the price tags and packages of products in retail or grocery shops are made up of a series of vertical black bars and spaces. They are called 1-D because the information coded in these barcodes are decoded or communicated only by the difference in their horizontal dimension, i.e. the width of the bars and spaces and their position from left to right.

1-D barcode was commercially introduced in 1966 and in very short span of time they gained widespread acceptance but the amount of the data they can store is very low. In time, demand increased for the new type of barcodes that could hold more information and use more character types, and still are not very lengthy or big in size so as to become unwieldy and impracticable in comparison to 1-D codes. To surmount these practical problems, several attempts were made to increase the amount of information contained in a barcode by increasing the numbers of bars or producing multiple barcodes layout. These attempts, as it was expected, resulted in a bigger barcode area, problems in retrieval of encoded information from such barcodes and on other hand it also increased the printing cost.

To overcome these problems, 2-D codes were developed, first as stacked barcodes, which repeats the same linear symbology vertically and then as matrix codes, composed of small, symmetrical elements arranged in a square or rectangular form as shown in Fig.1

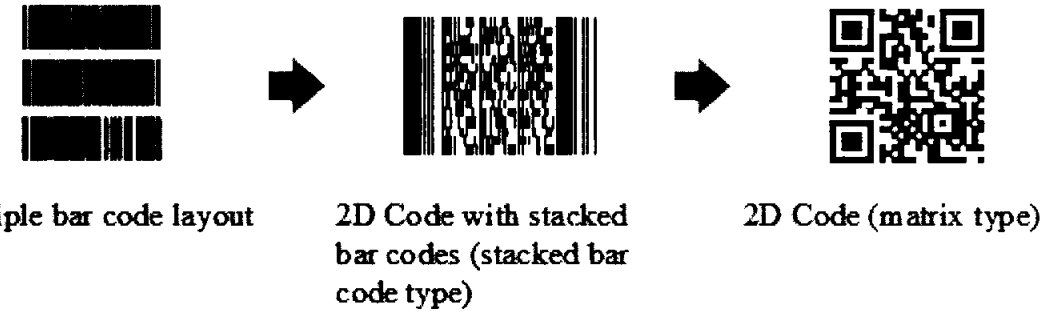


Fig. 1 Phases in development of 2-D Barcodes

3. Mechanism of QR Code

The 2-D codes contained information in both the directions, horizontal as well as vertical, and meet the current needs of the market for the high data density and smaller size, however further improvements in this regard are still possible and are a matter of future research in this area to fulfill the ever increasing demands of the market.

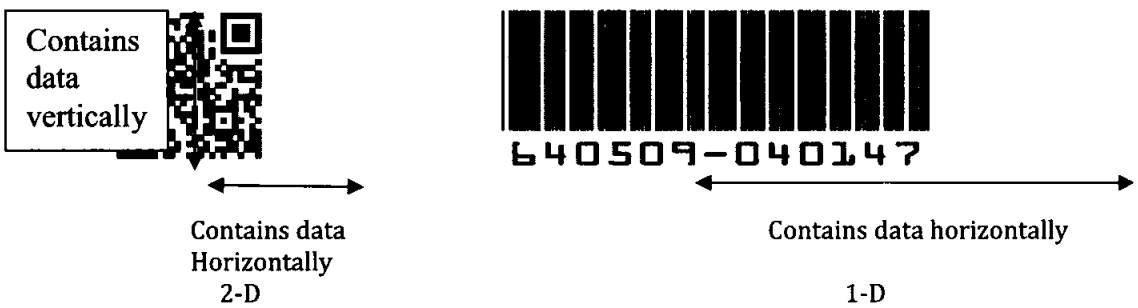


Fig. 2 How 1-D and 2-D codes contains data

3.1 Structure and Size of Q R Code

Each QR Code is a regular square array constructed of several nominally square modules, including an encoding region and function patterns, namely finder, separator, timing patterns, and alignment patterns. Function patterns cannot be used to encode data, and the QR Code symbol is surrounded by quiet zone on all four sides as shown in the Fig. 3

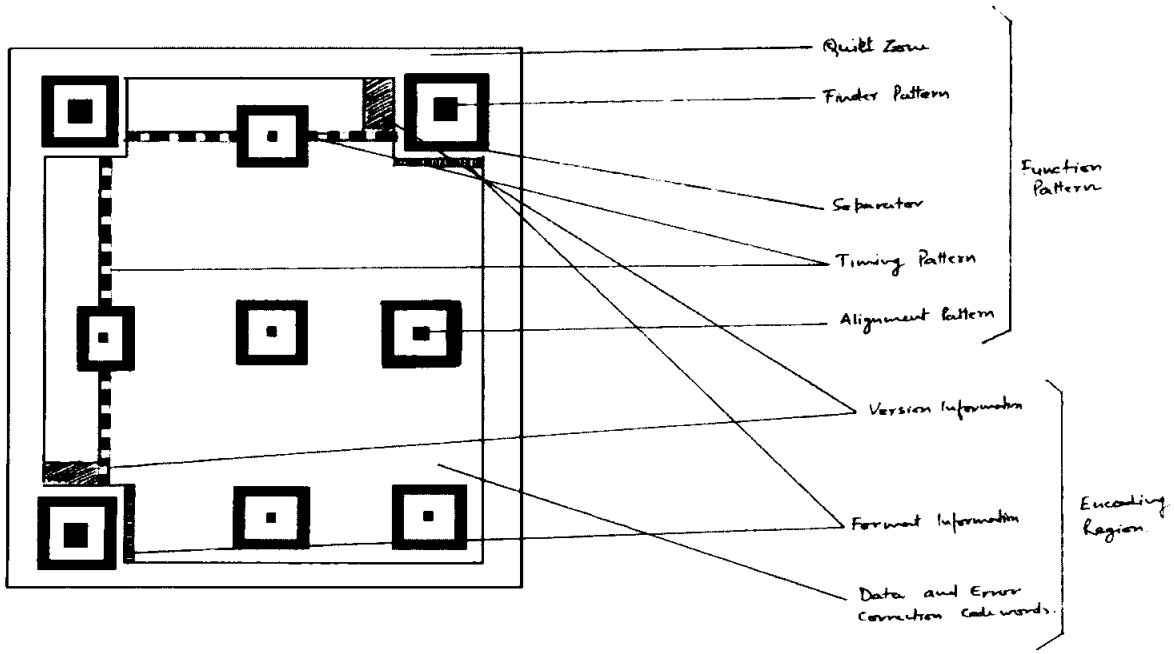


Fig. 3 Structure of Q R Code

QR Code conveys information by the arrangement of its dark and light elements and these elements are called "modules" in rows and columns i.e. in both the directions vertical and horizontal.

The modules in QR Code perform several functions- some contains the actual data and others are grouped into various function patterns that improves scanning performance and allow symbols alignment, error correction and deformation compensation.

3.2 Error Correction in Q R Code

Even if a QR Code is partially dirty or damaged from the corners, the data encoded in the Q R Code can be recovered. And its recovery depends on the amount of dirt or damage. For this Reed-Solomon error correction is used in Q R Codes. At present four levels of Reed-Solomon error correction are available to choose, which allow recovery of the Q R Code symbol code words. These four levels of corrections are as follows-

- Level L 7%
- Level M 15%
- Level Q 25%
- Level H 30%

3.2 Version of Q R Code

There are 40 different versions available to generate the QR Code symbols, from 21 X 21 modules (Version 1) to 177 X 177 modules (Version 40). In each version of QR Code, it has 4 additional modules per side (16 additional modules per code).

3.3 Features and characteristics of Q R Codes

In version 40 with error correction level L Q R Code can hold 7089 characters of numeric data, 4296 characters of alphanumeric data, 2953 character of binary data and 1817 characters of Kanji data (Japanese,

Chinese or Korean characters) with such a large data capacity Q R Code is much ahead of its peer in data density, small size and high speed capacity. A comparison of some 2-D codes is shown in Fig. 4

		QR Codes	PDF 417	Data Matrix	Maxi Code
					
Developer		DENSO Wave	Symbol Technologies	RVSI Acuity CiMatrix	UPS
Type		Matrix	Stacked Barcode	Matrix	Matrix
Data Capacity	Numeric	7089	2710	3116	138
	Alphanumeric	4296	1850	2355	93
	Binary	2953	1018	1556	-
	Japanese, Chinese or Korean Characters	1817	554	778	-
Main Features		Large Data Capacity, small size, high-speed scanning	Large capacity	Small size	High-speed scanning
Main Applications		All categories	Office automation	Factory automation	Logistics
Standards		AIM, JIS, ISO	AIM, ISO	AIM, ISO	AIM, ISO

Fig. 4 Comparison between some 2-D Bar Codes

4. How to generate Q R Code

The DENSO Wave Incorporated holds the patent for the Q R Code as they are the inventor and the owner of the Q R Code trademark but they have allowed it to be freely available to the public for its application and implementation in various fields. Nowadays numbers of websites are providing software for generating the code freely. The ISO standard for the Q R code is 18004. ISO compliant Q R Code generating software ensures maximum symbol readability and specifies the minimum printable size for the given symbol.

5. How to read/scan Q R Code

A large variety of reading/scanning software/applications are freely available online for the use in Smartphone. If we search the web using the search terms like Q R Code scanner/reader number of options open up, some of these applications provide both the options for generating as well as scanning/reading the Q R Code. Once these applications are downloaded, we simply need to open the application in the Smartphone, and point the camera of the Smartphone at the Q R Code and click its picture as we would click any picture. The application installed in the Smartphone will read/scan the embedded information inside the code and presents a link which once selected, will open a page in the browser containing the information sought.

6. Libraries and Q R Code

Q R Code can be used for physical as well as online/digital libraries

1. Libraries can exhibit latest information on their notice boards incorporating Q R Codes linking to

these information i.e. music, videos, website, surveys, coming conferences or any other important information, useful for their users.

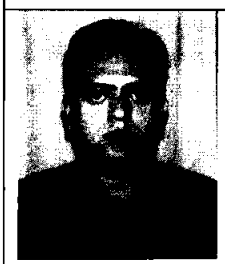
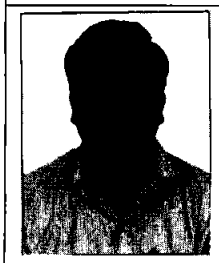
2. Libraries can link audio tour with the help of Q R Code for library orientation.
3. Similarly libraries can link video tour with the help of Q R Code for library orientation.
4. Q R Code can be put on video/DVDs case, linking to their trailers available online so that any user can see the trailer of required movie or video he/she want to see before borrowing it from the library.
5. Q R Code can be added to pamphlets' or printed handouts for getting more information on mobile friendly website.
6. Q R Code can be put in the stack hall or in the periodical section that link to their electronic online holding of print material available in the library.

7. Conclusion

The advancement in mobile technologies continues to evolve new things at very fast speed. In the very fast and busy life of the users they do not want to sit in the libraries for long hours. Actually they want all the information on their smart phone. For this Q R Code can be used as a tool to link the physical and virtual library. With the help of Q R Code any library can give information to their users, who are mobile friendly and more comfortable to do all the thing on their mobile phones.

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Radio Frequency Identification (RFID): *An Overview*

Meera Newmon **Vandana Sengar**



This paper work attempts to improve localization precision of a passive RFID localization system by using sparsely distributed RFID tags. This paper first defines a measure for accuracy and precision in a passive RFID localization system with regard to RFID tag distribution. Finally challenges and perspectives for future improvements of security measures in RFID systems and privacy issues will be outlined.



Radio Frequency Identification, RFID, RFID tags, components, Security.

1. Introduction

Radio Frequency Identification (RFID) technology is a non-contact, automatic identification technology that uses radio signals to identify, track, sort and detect a variety of objects including people, vehicles, goods and assets without the need for direct contact (as found in magnetic stripe technology) or line of sight contact (as found in bar code technology). Radio Frequency Identification (RFID) is coming, and it's bringing a streamlined revolution RFID technology can track the movements of objects through a network of radio-enabled scanning devices over a distance of several meters. A device called an RFID tag (or simply a tag) is a key component of the technology. In this paper, we suggest an access control mechanism for RFID security.

2. How Does RFID Work?

Systems that make use of RFID technology are typically composed of three key elements:

- An RFID tag, or transponder, that carries object-identifying data.
- An RFID tag reader, or transceiver, that reads and writes tag data.
- A back-end database, that stores records associated with tag contents.

Each tag contains a unique identity code. An RFID reader emits a low-level radio frequency magnetic field that energizes the tag. The tag responds to the reader's query and announces its presence via radio waves, transmitting its unique identification data. This data is decoded by the reader and passed to the local application system via middleware. The middleware acts as an interface between the reader and the RFID application system. The system will then search and match the identity code with the information stored in the host database or backend system. In this way, accessibility or authorization for further processing can be granted or refused, depending on results received by the reader and processed by the database.

3. RFID System Components

- An ADC (Automated Data Collection) technology that:
- It uses radio-frequency waves to transfer data between a reader and a movable item to identify, categorize and track.
- It is fast and does not require physical sight or contact between reader/scanner and the tagged item.
- It performs the operation using low cost components.
- It attempts to provide unique identification and backend integration that allows for wide range of applications.
- Other ADC technologies: Bar codes, OCR.

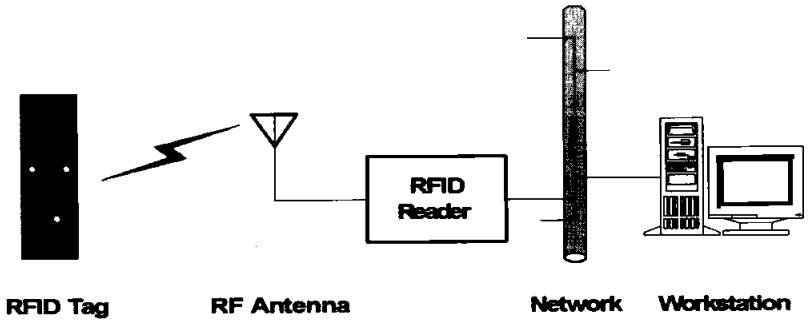


Fig.1: Radio-Frequency Identification (RFID)

Radio-frequency identification (RFID) based access-control system allows only authorized persons to enter a particular area of an establishment. The authorized persons are provided with unique tags, using which they can access that area. The system is based on micro controller AT89C52 and comprises an RFID module, an LCD module for displaying the status and a relay for opening the door. Fig.1 shows a user trying to open the door by placing an RFID tag near the RFID reader.

4. Radio-Frequency Identification

You might be familiar with RFID systems as seen in access control, contactless payment systems, product tracking and inventory control, etc. Basically, an RFID system consists of three components: an antenna or coil, a transceiver (with decoder) and a transponder (RF tag) electronically programmed with unique information. Fig.2 shows a typical RFID system. In every RFID system, the transponder tags contain unique identifying information. This information can be as little as a single binary bit or a large array of bits representing such things as an identity code, personal medical information or literally any type of information that can be stored in digital binary format.

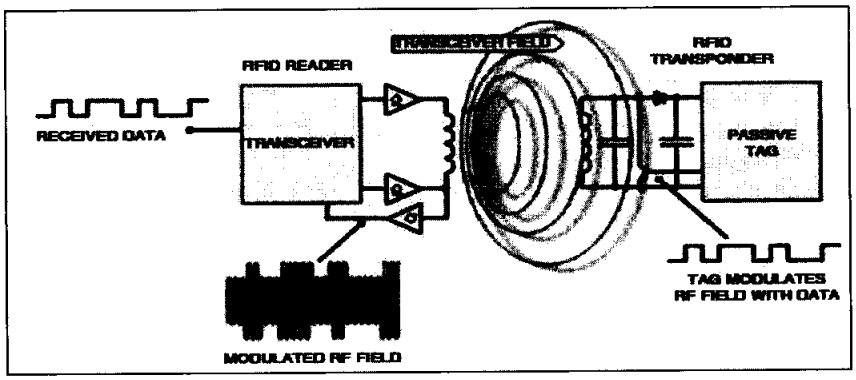


Fig.2: A Typical RFID System

The RFID transceiver communicates with a passive tag. Passive tags have no power source of their own and instead derive power from the incident electromagnetic field. Commonly, at the heart of each tag is a microchip. When the tag enters the generated RF field, it is able to draw enough power from the field to access its internal memory and transmit its stored information. When the transponder tag draws power in this way, the resultant interaction of the RF fields causes the voltage at the transceiver antenna to drop in value. This effect is utilized by the tag to communicate its information to the reader. The tag is able to control the amount of power drawn from the field and by doing so it can modulate the voltage sensed at the transceiver according to the bit pattern it wishes to transmit.

5. Tags (Transponders)

An RFID tag comprises a microchip containing identifying information and an antenna that transmits this data wirelessly to the reader. At its most basic, the chip will contain a serialized identifier, or license plate number, that uniquely identifies that item, similar to the way many bar codes are used today.

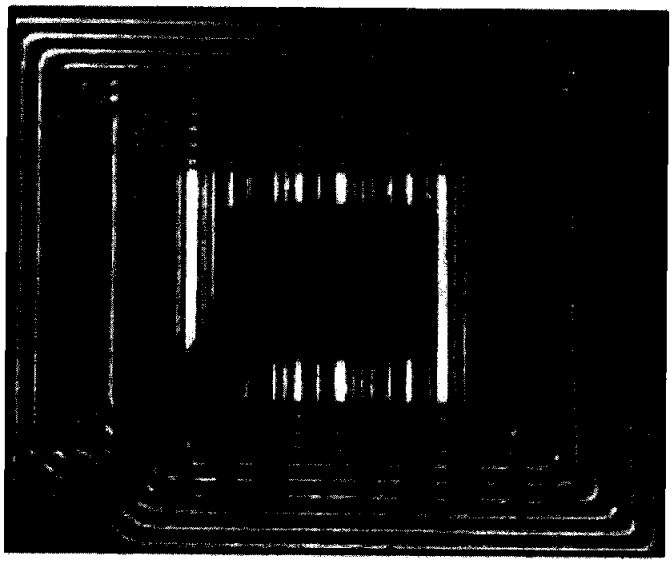


Fig.3: Internal Structure of a Typical RFID Tag

There are three types of tags: Active, Passive and Semi-passive.

Active transponders have their own transmitters and power source, usually in the form of a small battery. These remain in a low-power 'idle' state until they detect the presence of the RF field being sent by the reader. When the tag leaves the area of the reader, it again powers down to its idle state to conserve its battery. As a result, active tags can be detected at a greater range than passive tags.

Passive tags have no internal power source. These draw their power from the electromagnetic field generated by the RFID reader and then the microchip can send back information on the same wave. The reading range is limited when using passive tags. Semi-passive tags have their own power source that powers only the microchip. These have no transmitter. They rely on altering the RF field from the transceiver to transmit their data.

6. There are three ways for data encoding into tags

- Read-only tags contain data, which is pre-written onto them by the tag manufacturer or distributor.
- Write-once tags enable a user to write data to the tag one time in production more distribution processes.
- Full read-write tags allow new data to be written to the tag as needed and later other data can be rewritten over the original data.

6.1. RF Transceiver

The RF transceiver is the source of the RF energy used to activate and power the passive RFID tags. It may be enclosed in the same cabinet as the reader or it may be a separate piece of equipment. When provided

as a separate piece of equipment, the transceiver is commonly referred to as an RF module. The RF transceiver controls and modulates the radio frequencies that the antenna transmits and receives. The transceiver filters and amplifies the back-scatter signal from a passive RFID tag.

7. RFID Communication

- Host manages Reader(s) and issues Commands
- Reader and tag communicate via RF signal
- Carrier signal generated by the reader
- Carrier signal sent out through the antennas
- Carrier signal hits tag(s)
- Tag receives and modifies carrier signal "sends back" modulated signal (Passive Backscatter – also referred to as "field disturbance device")
- Antennas receive the modulated signal and send them to the Reader
- Reader decodes the data
- Results returned to the host application

8. RFID Applications

- Manufacturing and Processing
- Inventory and production process monitoring
- Warehouse order fulfillment
- Supply Chain Management
- Inventory tracking systems
- Logistics management
- Retail
- Inventory control and customer insight
- Auto checkout with reverse logistics
- Security
- Access control
- Counterfeiting and Theft control/prevention
- In Library's and Shopping Mall's
- Location Tracking
- Traffic movement control and parking management
- Wildlife/Livestock monitoring and tracking

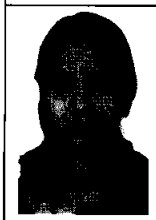
9. Conclusion

Use of RFID technology is increasing across a range of different industries, the associated security and privacy issues need to be carefully addressed. Because RFID tags come in different flavors, there is no overall, generic RFID security solution. Some low-cost passive and basic tags cannot execute standard cryptographic operations like encryption, strong pseudorandom number generation, and hashing. Some tags cost more than basic RFID tags, and can perform symmetric-key cryptographic operations. Organizations wishing to use RFID technology need to therefore evaluate the cost and security implications as well as understand the limitations of different RFID technologies and solutions.

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RFID Technology: *Beyond the Bar Codes*

Nadeem Ullah Khan, **Pavan Agarwal** **Kulshrestha, S B**



The Technology arrived in 1980's called RFID (Radio & Frequency Identification) is an exciting new technology being applied by the Libraries. It is a Radio Frequency based Identification System which works with the help of intelligent tags. The uses of RFID brings new functionaries, as multiple checks in & check out, Shelves inventory and book return with identification, reactivation of the anti-theft function & data base. This paper is an attempt to know about the RFID technology, its advantage and disadvantages in Library and about the current trends. This technology will play a significant role in the Library information centers in up coming years



RFID Technology, EM (Electro Magnetic), RF (Radio Frequency)

1. Introduction

Radio frequency Identification is the latest technology being used in the Library for detection. It has a combination of Radio Frequency & Microchip technology. It retrieves and Store data from computer chips using radio frequency transmission. It is an emerging, more effective, convenient, and cost effective technology in Library automation and security. Libraries began using this technology in the late Nineties most libraries around the world in United States, Canada, UK and Singapore is using this technology for library functions. Libraries can use in various library operation like charging and discharging, stock verification shelf checking etc. Its improve security in libraries. It has an advanced security components that may alert Library Staff when documents are removed from the Library with out consent. It can improve circulates and inventory control.

2. Basic Components of RFID

RFID System Comprises three basic components tags, Readers & Server.

- **Tags:** RFID tags have an antenna and Circuit it is paper thin flexible and 2" x 2" in size which allow it to be placed inside the book the capacity of antenna with 64 bits. Its coming in active, passive or semi active in a variety, Shape and size. Active tags have their own internal power supply while passive have no power it is chip in cost compare than active tags. Most of the libraries can use passive tags.
- **Readers:** RFID readers to detect and read information contain and tags. Its available in various shape and size it can installed in the library. The reader power antenna to generate the radio frequency field when a tag passes through this field, the information stored in the chip is decoded by reader and send to the server which communicate to the library information system .
- **Server:** It is a communication gateway among the various components of an RFID System. It received the information from one or more readers and exchange information with circulation data base.

  The server includes a relational data base so that report cab be generated.

3. Advantage of RFID for Libraries

- **Fast Charging/Discharging:** The use of RFID reduces the amount of time required to perform circulation operations. RFID can read stored information much faster than barcodes.

- **Patron Self Charging/Discharging:** Self Charging is easy as the charging material can be placed in any orientation to the reader. Self discharging has also become simplified as now a reader is affixed on the book drop down box which automatically discharges the document and activates the security mode on. It also relieves staff for other services.
- **High Reliability:** The readers are highly reliable due to its Radio Frequency base. The possibility of errors is one in 3 million, which is almost small.
- **High Speed Stock Checking:** RFID system has a unique advantage of its ability to scan books on shelves without removing them. A hand held RFID reader can be moved rapidly across the shelves to read all the available stock. Within minutes a report can be generated regarding total no. of volumes available and issued and it also identifies total no. of volumes out of proper order.
- **Long Tag Life:** RFID tags last longer than barcodes. RFID vendors claim a minimum of 100,000 transactions before a tag may need to be replaced.

4. Disadvantage of RFID for Libraries

- **High Cost:** The biggest hurdle in RFID's path is cost, a RFID readers start off at about Rs. 23,000 to 25,000 and the cheapest tags come for about Rs. 50. On the other hand Barcode are only about 50 paisa.
- **Exit Sensor Frequency:** The Exit Sensor frequency is required to be higher than other readers that means higher cost factor.
- **Patron Privacy:** There is a perception among some that RFID is a threat to patron privacy. The perception is based on two misconceptions :
    - that tag contains patron information.
    - that they can be read by any RFID reader.

The answer is that although the tag contains patron information but they are linked only with circulation mode of automated library system. It is also not possible to read tags by any other RFID readers.

- **Incompatible RFID Standards:** The current standard only seek electronic compatibility between tags & readers. The pattern of storing information & the software provided by the vendors differ from one vendor to another, therefore, a change from one vendor system to the other would require retagging all items or modifying the software.

5. Need of RFID in Libraries

RFID is used in libraries primarily to automatic the book handling process including checkout, inventory maintenance and checking when combined with automatic or computer assisted shorting equipment, RFID facilities and speedup book sorting automatic this process allow librarians to spend more time with customers increasing customer satisfaction.

5.1. Guidelines for Libraries use of RFID –

- The Library should be open about its use of RFID technology including providing publicly available documents stating the rational for using RFID, objectives of its use and associated policies and procedure and who to contact with questions.
- Only authorized personnel should have access to the RFID system.
- No personal information should be stored on the RFID Tag.

- Information describing the tagged item should be encrypted on the tag even if the data is limited to a serial number.
- No static information should be contained on the tag that can be read by unauthorized readers.
- All communication between tag and reader should be encrypted via a unique encryption key.
- All RFID readers in the library should be clearly marked.

6. Conclusion

RFID technology is an emerging, more effective, convenient and cost efficient technology in library automation and security. It will change the electronic environment of libraries. . It will provide improved speed and ease of use in document handling. It will increase the productivity and library staff can concentrate on more productive and personalized information services. Library professionals should try to develop a common standard for RFID for its successful use.

Finally, libraries must be outspoken in their public education efforts related to RFID No. only are libraries one of many industries who can benefit from the safe implementation of RFID systems, but also because RFID represents the start of a slippery slope to ever greater loss of control over our personal information.

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Application of Barcode in the University Libraries of Uttar Pradesh

Salma Khan



The study was carried at University Libraries of Uttar Pradesh, to study the application, status of automation and uses of Barcode Technology.

Automation, Barcode technology, University Libraries

1. Introduction

The advent of computers has brought many benefits to library and information systems and services. The application of computers in storage, retrieval and dissemination of information has brought new possibilities of automatic indexing and free text searching. Circulation procedure in a conventional system is very lengthy and consumes much of the staff time in repetitive works. The use of technological devices such as computers, barcode scanners, smart cards, etc in circulation helps in performing routine operations with accuracy, easily and quickly, it saves lot of time for the staff as well as users. It is simple and inexpensive method of encoding text information which can be easily readable by electronic readers. Barcodes are self contained machine-readable identification labels with information encoded in a series of parallel, adjacent bars and spaces. A basic barcode scanner consists of a decoder and a scanner. The basic operation of a scanner is to scan a barcode symbol and provide an electrical output that corresponds to the bars and spaces of a barcode. Barcode scanner acts in much the same way as a keyboard. The barcode by itself is not a system but an identification tool that provides an accurate and timely support of data transferring for sophisticated management systems.

2. Objective of the Study

- To find out whether University Libraries of Uttar Pradesh have gone for automation and to what extent.
- Whether these University Libraries of Uttar Pradesh have opted for Barcode technology in the libraries.

3. Research Methodology

The details of statistical analysis and interpretations of the data on the application of barcode technology in University Libraries of Uttar Pradesh are collected from the librarians through the structured questionnaires and semi-structured interviews and data collected through the observation visits to the libraries. The analysis of the consolidated data has been done based on the objectives set for the study using Excel and SPSS software. Thirty two library were selected for the study. Among these 4 libraries are from Central Universities, 6 are from Private Universities, 8 libraries are Deemed Universities, 14 are from Sate Government Universities.

4. Analysis of Data

4.1 Type of Universities

Table 1 - Type of Universities

Universities	Numbers of Universities
Central Universities	4 (12.5%)
State Universities	14 (43.75%)
Deemed Universities	8 (25%)
Private Universities	6 (18.75%)
Total	32 (100%)

4.2 Year of Library Automation Implemented

Table 2 - Year of Library Automation Implemented

Year of Automation	Central Univ.	State Univ.	Deemed Univ.	Private Univ.
<2000	1 (25%)	1 (7.14%)	1 (12.5%)	-
2000-2005	2 (50%)	3 (21.42%)	3 (37.5%)	2 (33.33%)
2005-2010		1 (7.14%)	2 (25%)	4 (66.66%)
Total	3 (75%)	5 (35.71%)	6 (75%)	6 (100%)

Chi-Square = .337: Chi-Square at 30df and 5 level of Significance is 32.667
Null Hypotheses = Accepted

Table 2 shows the commencement of library automation in university library under study. From the analysis it is evident that library automation largely commenced during the period 1995-2008 the analysis shows that 3(75 percent) of the libraries of are automated before 2002. The state universities libraries 3 (21.42 percent) automated in between 2000 and 2005. Among Deemed universities 3(37.5 percent) are automated between 2000-2005 and 2 (33.33 percent) of private universities are also automated during this period. Only 2 (50 percent) of Central Universities are automated in between 2000 and 2005. All the universities libraries surveyed are automated after 1990.

Chi- square test was carried out to test the association between the organization type and year of automation. The hypothesis tested was year of automation is independent of the type of organization. The computed Value of λ^2 is .337, which is less than table value (32.667) at 30 degree of freedom and 5 percent level of significance. Hence it can be conclude that year of automation and organization type are independent.

The majority of the libraries of central Universities (50 percent) and state universities (21.42 percent) and a good number of Deemed (37.5 percent) and Private universities (50 per cent) are automated in between 2000-2005. It is found that library automation in universities libraries under study largely commenced during the period 2000-2005. One central university library is automated before the year 2000. All the state university libraries surveyed are automated after 1990 and 2000.Chi-square test also indicates that there is no association between year of automaton and type of organization.

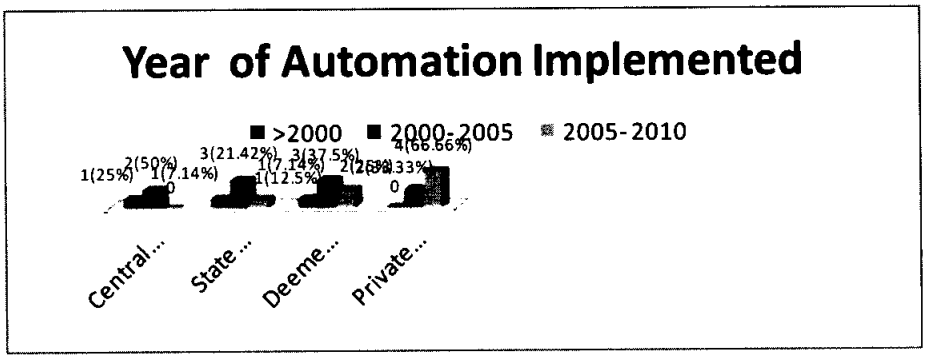


Figure 1 Year of Automation Implemented

4.3 Status of Automation

Table 3 Status of Library Automation

Type of the University	Partial	Full	Not Available	Total
Central University	3 (75%)	-	1 (25%)	4 (100%)
State University	4 (28.57%)	1 (7.14%)	9 (64.28%)	14 (100%)
Deemed University	2 (25%)	3 (37.5%)	3 (37.5%)	8 (100%)
Private University	1 (16.66%)	5 (83.33%)	-	6 (100%)
Total	10 (31.25%)	9 (28.12%)	13 (40.62%)	32 (100%)

Chi-Square = .009:Chi-Square at 6 df and 5 level of Significance is 17.122

Almost all the operation in a library can be computerized to achieve more efficient and effective functioning and providing excellent library and information services. Libraries were asked to indicate the library housekeeping operations they have automated. Table 3 shows the status of library automation in University libraries under study. Libraries of Central Universities (75 percent) and libraries of State Universities (28.57 percent), and Deemed Universities (25 percent), and Private Universities (16.66 percent) are partially automated; whereas State Universities Libraries (7.14 percent), Deemed universities (37 percent) and private universities (83.33 percent) of libraries are fully automated. Nearly all the private universities libraries are fully automated and all the central university libraries are partially automated. Majority of the state universities (64.28 percent) libraries have no automation. All the libraries of private universities have automation.

Chi- square test was carried out to test the association between the organization type and status of automation. The hypothesis tested was status of automation is independent of the type of universities. The computed Value of λ^2 is .009, which is less than table value (17.122) at 6 degree of freedom and 5 percent level of significance. Hence it can be conclude that status of automation and organization type are independent.

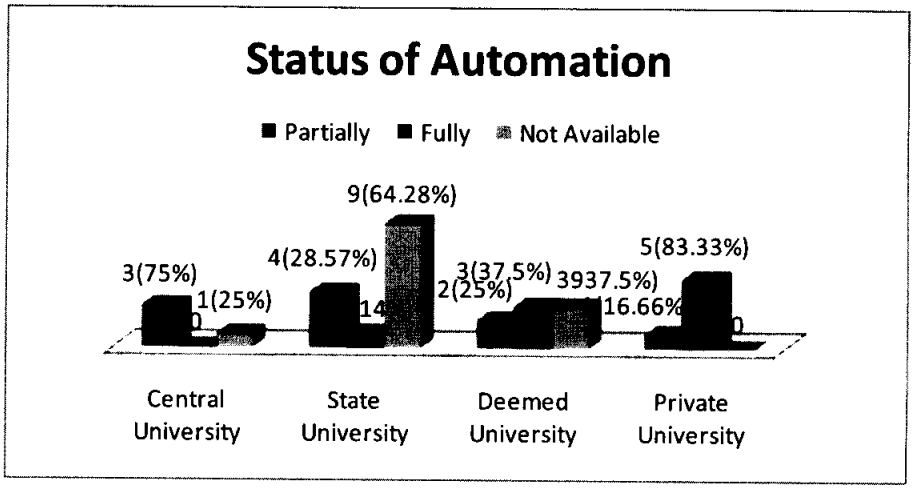


Figure 2 Status of Automation

4.4. Barcode Technology in Libraries

Table 4 Use of Barcode in the libraries

Type of the University	Yes	No	Total
Central University	1 (25%)	3 (75%)	4 (100%)
State University	3 (21.42%)	11 (78.57%)	14 (100%)
Deemed University	5 (62.5%)	3 (37.5%)	8 (100%)
Private University	5 (83.33%)	1 (16.66%)	6 (100%)
Total	14 (43.75%)	18 (56.25%)	32 (100%)

Chi-Square = .039: Chi-Square at 3 df and 5 level of Significance is 8.369

Barcodes are used in many forms of automated library circulation system, as well as in stock verification. Table 4 Show the use of barcode technology in university libraries under study. The analysis revealed that 83.33 per cent of the libraries of private universities are using barcode technology for both annual stock verifications and circulation of documents. All other libraries except one (25 percent) Central universities are not using this technology. It is seen that a few (43.75 percent) of libraries of universities are using barcode technology in the library. It may be due to the lack finance and manpower. It is observed that (78.57 percent) of state university libraries are not using barcode technology, it is observed that majority of these libraries have not gone for automation they are still operating their libraries manually. But barcode or smart card technology is very essential to fully computerize the circulation process.

It is found that only few university libraries under study are using barcode technology for circulation and stock verification of documents. Five libraries of private university libraries are using it for both circulation and stock verification.

Chi- square test was carried out to test the association between the organization type and Barcode technology in libraries. The hypothesis tested was Barcode technology is independent of the type of university. The computed Value of λ^2 is .039, which is less than table value (8.369) at 3 degree of freedom and 5 percent level of significance. Hence it can be conclude that Barcode technology and organization type are independent.

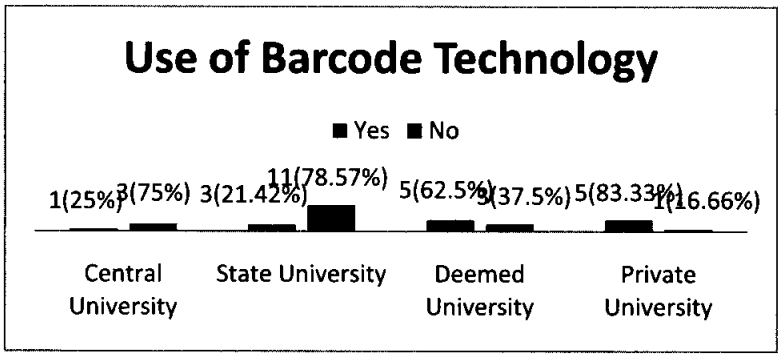


Figure 3 Use of Barcode Technology

5. Conclusion

The present study has been carried out in the university libraries of Uttar Pradesh. It is find out that Libraries of Universities have gone far ahead in computerized and automation. Majority of the libraries have gone for the automation. Majority of University libraries are not using barcode technology.

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RFID Technology for Library Security

Tank Manisha Kishor



The security of materials and information in a library is quite essential. Library consist intellectual documents as scholarly journals, books, reports, theses, magazines etc. The goal of the security system should be to provide a safe and secure facility for library documents, employees, library resources, library equipment and library patrons. At the same time due to application of security system, that promise to increase efficiency, productivity and enhance user satisfaction. Considering the importance of library security, the present paper concentrates on application of RFID technology in libraries, its components, benefits and role of librarian in RFID secured environment.



RFID, Library Security, Radio waves, Security System, Tag, Theft detection

1. Introduction:

We always see the slogan "the area is under surveillance, be aware". In such cases closed circuit cameras are used to keep watch on unlawful activities. These CCTV's are used to keep watch only, but RFID surveillance is used to restrict the unlawful activities from happening. The RFID technology is nothing but Radio Frequency Identification. It is the wireless non-contact use of radio frequency electromagnetic waves to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. The tags contain electronically stored information.

RFID tags are used in many industries for tracking the goods. Libraries also use RFID tags to secure the documents. The RFID surveillance is a need of time as the manpower problem always predominant I the libraries and libraries are rich in documents as academic wealth as well as in terms of financial value. So this valuable thing should be protected from unauthorized transaction. With the security these tags helps in stock checking of libraries. Previously we are using CCTV for keeping a eye on theft and illegal transactions. But always there is a advance in the technology and new and advanced technologies are developing which may benefit the system. Libraries always had sacristy of manpower therefore it is very difficult for library staff to keep a watch on theft and unissued documents to go outside the library. Thus a self sufficient security system of surveillance is a need of time in the library itself.

2. RFID Management System:

RFID (Radio Frequency Identification) is the latest technology to be used in library theft detection systems. Previously libraries are using surveillance systems using EM (Electro-Mechanical) and RF (Radio Frequency) systems. RFID-based systems not only serves as a security system but also can be used as tracking systems that combine security with more efficient tracking of materials throughout the library, including easier and faster charge and discharge, inventorying, and materials handling.

RFID is a combination of radio-frequency-based technology and microchip technology. The information contained on microchips in the tags affixed to library materials is read using radio frequency technology regardless of item orientation or alignment and distance from the item is not a critical factor except in the case of extra-wide exit gates. The corridors at the building exit can be as wide as four feet because the tags can be read at a distance of up to two feet by each of two parallel exit sensors.

3. The schematic diagram of RFID library management system

By automat zing the library using RFID system saves library staff's time, also this saves the valuable time of reader. When the services are automated then the library can think of new innovative services for the users

which benefits readers and in turn library. Using RFID circulation service is fully automatic using self check in/ Checkout system. For this we have to install special software. For circulation the users are provided with RFID card having personal identification number which is a unique identity number. A RFID tag is fitted on every document having a electromagnetic strip on it, this strip is charged when the documents are kept in the shelves. When the documents are to be issued then the library staffs demagnetize the strip and the documents are issued. At the time of returning back the document the library staff again magnetize the documents i.e. the tag on the document is activated. When a book is returned, the check-in/out system activates the surveillance bit.

4. The architecture of RFID library management system:

The library management system consists of following different blocks,

- **RFID tag:** An RFID tag is the most important link in any RFID system. It has the ability to store information relating to the specific item to which they are attached, rewrite again without any requirement for contact or line of sight. Data within a tag may provide identification for document, proof of ownership, original storage location, loan status and history. RFID Tag consists of an integrated circuit and an antenna combined to form a transponder. RFID tags collect the energy to operate from a Radio Frequency (RF) field emitted by a reader device; therefore they do not need a battery. When energized by a radio signal from a fixed position reader or handheld scanner, the tag returns the stored information in order that the item to which it is attached can be easily located. The chip also has a "multi-read" function, which means that several tags can be read at once. RFID tags have been specifically designed to be affixed into library media, including books, CDs, DVDs and tapes. It is thin, flexible and thus can be laminated between paper and plastic.
- **Staff station:** It is a staff assisted station on services such as loan, return, tagging, sorting and etc. It is loaded with arming/disarming module, tagging module and sorting module. Arming/Disarming module allows EAS (Electronic Article Surveillance) bit inside the tag of the library material to be set/reset so as to trigger/not trigger the alarm of the EAS gate. Checking of EAS status of library material is easy. The staff puts the item on the reader and click on the view to display the information stored inside the tag and status of EAS. There are also feature of Auto Arming and Auto Disarm. Auto Arm/Disarm will automatic arm/disarm library material that is within the Reader range.
- Together with circulation module from Library Management System Software, this station is used for the following services:
  - Editing and updating of patron's record
  - Add and deleting of patron's record
  - Generate loan history for a particular patrons
  - Managing of fines incurred by the patron
  - Arm/Disarm of EAS bit inside the library material
  - Program of new library material
  - Sort item in accordance to their branch and category number
  - The features of this station depend on the module loaded by the Library Management Software.
- **Library RFID System - Detection Gates:** The RFID EAS Gates is the anti-theft part of the Library RFID Management System using the same RFID tags embedded in the library items. Each lane is able to track items of about 1 meter and would trigger the alarm system when an un-borrowed item passed through them. The alarm will sound and lights on the gate will flash as patron passes through with the un-borrowed library material. Theft detection is an integral feature of the chip within the tag. It is a stand-alone technology, which operates independently of the library database.

- **Self check:** The patron self check out station is basically a compuer with a touch screen and a built-in-RFID reader, plus special software for personal identification, book and other media handling and circulation. After identifying the patron with a library ID card, a barcode card, or his personal ID number (PIN), the patron is asked to choose the next action (check-out of one or several books). After choosing check-out , the patron puts the book(s) in front of the screen on the RFID reader and the display will show the book title and its ID number (other optional information can be shown if desired) which have been checked out.
- **Book drop:** The Book Drops can be located anywhere, within or outside the library. Possible remote locations outside the library include MRT/train stations, shopping centers, schools, etc. This offers unprecedented flexibility and convenience of returning library items at anytime of the day, even when the library is closed. Patron inserts the library item into the slot. The reader captures the electronic signature and sends to backend system for loan cancellation. Patron is acknowledged by beeping sound and flashlight. Patron's record is updated immediately. This is possible due to the seamless link between Library RFID Management System and the host computer system. As such, users who have reached their loan quota can start borrowing items once they have returned them through the Book Drop.
- **Library shelf management:** The Shelf Management Solution makes locating and identifying items on the shelves an easy task for librarians. It comprises basically of a portable scanner and a base station.The solution is designed to cover three main requirements:

  Search for individual books requested

  Inventory check of the whole library stock

  Search for books which are miss-helved

5. Advantages of RFID in Libraries

The use of RFID reduces the amount of time required to perform circulation operations. The most significant time saving with the fact that information can be read from RFID tags much faster than form barcodes and that served items in the stack can be read at the same time.

- Self charging discharging
- Reliability
- Streamlined Inventory Management
- Longitivity of Tag life
- Faster Circulation
- Automated materials handling
- Easy stock verification
- Theft reduction
- High level of security
- Mis-shelve easy identification
- External Book Return
- Improved tracking of high value items
- Inventory visibility accuracy and efficiency
- RFID technology is better than bar codes as it cannot be easily replicated and therefore, it increases the security of the product.

6. Disadvantages of RFID in Libraries:

- High Cost
- Frequency Block
- Chances of removal of exposed tags exit gate sensor problems
- User Privacy concern
- Reader collision
- Tag collision
- Interoperability

7. Role of a Librarian

In this latest technology based library management system a librarian can play a vital role as he is the person who manages the library system and has to manage. The technology allows for greatly improved services for patrons especially in the area of self check out, it allows for more efficient use of professional staff, and may reduce repetitive stress to library workers. But the library using RFID technology should serves to legitimize the technology in the eyes of the community. Therefore, it is incumbent on the library community to ensure that the technology is developed in concern with established privacy principles and that any library use of RFID follows best practices guidelines consistent with library values.

8. Conclusion

RFID technology is not only emerging fast but also more effective, convenient and cost efficient technology in library security. This technology has slowly begun to replace the traditional bar-code on library items. The RFID tag can contain identifying information such as a book's title or material type, without having to be pointed to a separate. The information is read by an RFID reader, which replaces the standard barcode reader commonly found at a library's circulation desk. The RFID tag may replace or be added to the barcode, offering a different means of inventory management by the staff and self service by the borrowed. It can also act as a security device, taking the place of the traditional electromagnetic security strip. And not only the books, but also the membership cards could be fitted with an RFID tag. The cost of the technology is main constraint.

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Use of Cloud Computing in Libraries: An Overview

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Abstract

Cloud Computing brings the revolutionary changes in the world of information communication technology because of its potential benefits such as reduced cost, accessible anywhere, anytime, as well as its elasticity and flexibility. This paper provides brief information on Cloud Computing and its application for Libraries. This paper provides some basic idea to choose evaluate cloud service for the library. The paper also describes use of Cloud computing in libraries and how Cloud computing actually works is illustrated in this communication. The advantages, disadvantages and features needs to be seriously considered before putting data on the cloud.



Cloud Computing, Libraries, Computer Applications, Cloud Computing models.

1. Introduction

Today we are living in the age of information. Information technology play very vital role in library science. For collection, storage, organization, processing, analysis of information. Library field facing many challenges in the profession due to applications of information technology. New concepts are being added to ease the practices in the libraries is also accepting many new technologies in the profession as they suit the present information handling and they satisfy needs of the knowledge society. With the advent of Information technology, Libraries have become automated which is the basic need towards advancement followed by networks and more effort are towards virtual libraries. The emergence of e-publications, digital libraries, internet usage, web tools applications for libraries, consortium practices leads to the further developments in library profession. The latest technology trend in library science is use of cloud computing for various purposes and for achieving economy in library functions. Since cloud computing is a new and core area the professionals should be aware of it also the application of cloud computing in library science. Cloud Computing refers to both applications delivered as a service over the internet and the systems software in the data centres that provide services. In simple words the data centers, hardware and systems software is what we can call a Cloud. A simple example of cloud computing is Yahoo mail, Gmail etc. One does not need any software or server to store them. These services are free to all users till some limit, any extra storage capacity and advanced services are available at cost.

2. Types of Cloud Computing

- **On the basis of service**

  - **Infrastructure**: Infrastructure is referred as resource clouds. Resource (Infrastructure) is being provided by third party as service to the users to use them the way they want (e.g., Amazon S3)
  - **Platform**: Platform is a set of computational resources using which one can use the infrastructure. In other words a set of computer application developed and hosted on the cloud to access and manage the data (e.g., Google App Engine, Windows Azure (Platform))
  - **Services:** Services are the set of applications developed by the service provider to use cloud infrastructure and platform (e.g., Google Docs)

- **On the basis of usage**

  - **Private**: Private clouds are available only to the members of the organization. The cloud will facilitate user to store and disseminate their data on respective cloud (e.g., Institutional cloud, e bay)

- **Public**: Any institute may use cloud service from third party which may available free or with cost can be considered as public cloud (e.g., Google apps, Windows Azure)
- **Hybrid**: As public cloud allow any organization to outsource their part of infrastructure to service provider, at the same time organization would lose the control over resources and data management. In this type of cloud a part of cloud will be given to public for user (e.g., Google Apps)
- **Community:** Community clouds are specifically organized clouds and are limited for specific group (e.g., Institutional Gmail of Google Apps)
- **Special Cloud:** Special clouds are extensions of normal cloud system to provide additional services. (e.g., Google App Engine)

3. Features of Cloud Computing:

- **Elasticity and Scalability:** Elasticity is one of the essential and core features of cloud systems. This is very important feature of this service that any modification and enhancement in the services are very easy and fast which make this service very scalable and resilient. One can easily add up required bandwidth, processing speed and data storage or number of licence in very short time. One need not to plan any more for project costing, procurement, project implementation of project closer; but one need to place a purchase order to the service provider to get the service in due time.
- **Multi-tenancy:** Multi tenancy is a highly essential issue in cloud system, where the location of code and / or data is principally unknown and the same resource may be assigned to multiple users (potentially at the same time). This affects infrastructure resources as well as data / applications / services that are hosted on shared resources but need to be made available in multiple isolated instances.
- **Energy Consumption:** Energy consumption is relevant to reduce additional costs of energy consumption. In case of traditional system one has to keep all the servers on as the data loaded on the server for round the clock access. Cloud is a based on network environment and therefore, principally allow reducing the energy consumption.
- **Reliability:** It's an amazing characteristic of cloud computing. Reliability is one needed characteristic of cloud computing that will increase when redundant websites are accessed. Reliability is improved by having multiple sites for the same service, such that if one faces an outage, the other can take over the load.
- **Security:** Security is obviously essential in all systems dealing with potentially sensitive data and code. The cloud is managed and administered by the team of IT expert. Therefore, the data will be secure in terms of data loss and system crash.
- **Consumption based billing:** The capability to build up cost according to the actual consumption of resources is a relevant feature of cloud systems. Pay per use strongly relates to quality of service support, where specific requirements to be met by the system and hence to be paid for can be specified. One of the great features of cloud is, if you don't use the resource and you pay nothing.
- **Data Management:** Data Management is an essential aspect in sense of storage, where data is flexibly distributed across multiple resources. Implicitly, data consistency needs to be maintained over a wide distribution of replicated data sources. At the same time, the system always needs to be aware of the location at the time of replicating data across the data centres. Therefore, data management is a tremendous feature of cloud environment.

- **Managing Cloud Activities:** One of the most considerable features of the cloud is a management and monitoring of cloud application. As cloud manager works within a distributed wide area network infrastructure; one can monitor it from all over the world. One of the biggest shifts from the traditional data centre is that all the data stored, managed and administered in a cloud.
- **Self Service Model:** The one of the reason behind popularity of cloud based environment is self service model. In some cases users have the ability to upload files, build programs, deploy, schedule, manage and generate reports. This service is available to the users based on demand.

4. Working of Cloud Computing

Cloud computing system can be divided it into two sections: the front end and the back end. They connect to each other through a network, usually the internet. The front end is the side the computer user, or client sees .the back end is the "cloud" section of the system. On the back end there are various computers, servers and data storage systems that create the "cloud" of computing services .A central server administers the system monitoring traffic and client demands to ensure everything runs smoothly. It follows a set of rules called protocols servers and remote computers do most of the work and store the data.

5. Use of Cloud Computing in Library and Information Science

Cloud computing offers many interesting possibilities for libraries that may help to reduce technology cost and increase capacity reliability, and performance for some type of automation activities. Cloud computing has made strong inroads into other commercial sectors and is now beginning to find more application in library science. The cloud computing pushes hardware to more abstract levels. Most of us are acquainted with fast computing power being delivered from systems that we can see and touch.

6. Role of Cloud Computing in Libraries

Cloud computing is a completely new in technology and it is known as 3rd revolution after PC and Internet. Cloud computing is an enhancement of distributed computing, parallel computing, grid computing and distributed databases. Among these, grid and utility computing are known as predecessors of cloud computing. Cloud computing has large potential for libraries. Libraries may put more and more content into the loud. Using cloud computing user would be able to browse a physical shelf of books, CDS or DVDS or choose to take out an item or scan a bar code into his mobile device. All historical and rare documents would be scanned into a comprehensive, easily searchable database and would be accessible to any researcher. Many libraries already have online catalogues and share bibliographic data with OCLC. More frequent online catalogues are linked to consortium that share resources.

7. Areas of Library where Cloud Computing can be applied:

In today's scenario libraries are adopting advanced technology in their day-to-day activity and the concept of cloud is one of them. In libraries there are main two areas which can be moved on the cloud.

- **Automation of Housekeeping operations**
- **Digital Library**: With a view to Indian Libraries one need to examine all the criteria before choosing any cloud service. Because, when it is planned to use third party services one need to have through idea about the whole system. If one thinks that our all day-to-day activities can be moved then, first of all searching the standard company who has set of various software and hardware and experience in handling such services. There are many companies in the market which provide this kind of services. (e.g., Ex Libris, Duracloud, Polaris Library System)
- **Architecture of Cloud for Library:** Architecture of cloud databases for libraries is a major view point of the selection of cloud services. One need to keep some criteria for evaluation of

databases, application, hardware configuration etc., The application server and database server are different but it is not necessary that the both need to be independent. But database and application can be loaded on the same server. First code will be generated on the application and then the database will be created on data storage server. After database creation an administrative control node will create records and save it on the server. On the other hand the saved data will be available on computer network and finally user can access the data stored in the server in various form.

8. Service Providers of Cloud Computing for Libraries

- **Ex Libris:** Ex Libris is a well is a well known cloud service provider based in USA. They are providing cloud solution in the field of library with all the software and hardware support needed to provide services to the users. Ex Libris is available for all type of libraries and also for consoria. Ex Libris is bul on various standard and contains number of features like compatibiliy with Unicode font, flexibility, migration of data, customization etc.,
- **Polaris Library Systems:** Polaris is one of the cloud based library automation system available in the market. The company also provides standard acquisition and processing system. Also, with a Polaris ILS Client License, the library can integrate various PC and print management systems at not extra cost. The systems uses number of well know standards like MARC 21 for bibliographic data, XML, Z39.50 for information retrieval, Unicode etc.,
- **Dura Cloud:** Dura Cloud is providing cloud solution for digital library services. Dura Cloud is a sister concern of the Duraspace which is a collaboration of the Dspace digital library software and Fedora Commons. Fedora Commons is a framework for digital repository. It offers complete solution for digital library with standard software and hardware solution. Dura cloud also provides open source code and the code needs to be installed on your machine. Where in case if you use Dura Cloud Storage and software you have to subscribe Dura Cloud services with a nominal cost.

9. Advantages and Disadvantages in Cloud Computing:

Like any other technology cloud computing do also have its advantages and disadvantages, which needs to be taken into consideration before implementing this new technology.

Advantages:

- Cost effective
- Flexible and innovative
- Round the clock access
- Simplified cost and consumption model
- Enterprise Grade Services and Management
- Faster Provisioning of Systems and Applications
- Simplicity of Integration
- Highly Secured Infrastructure
- Compliant Facilities and Processes
- Flexible and resilient in disaster recovery
- Reduces hardware and maintenance cost

Disadvantages:

- Risk or data loss
- Failure in compliance
- Constant connectivity required

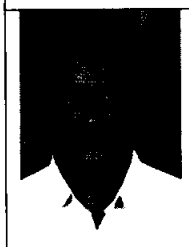
- Dependency
- Quality problems with cloud service provider
- Time and Budget Constraints
- Since all the developed and deployment have been done by Cloud service provider, it is very difficult to get good grip on overall system

9. Conclusion

Cloud computing builds on decades of research in virtualization, distributed computing, utility computing, more recently networking, and web software services. It implies a service oriented architecture, reduced information technology overhead forth end-user, great flexibility, reduced total cost of ownership, on demand services and many other things. In today's global competitive market, companies must innovate and get the most from its resources to succeed. Cloud computing infrastructures are next generation platforms that can provide tremendous value to companies of any size. They can help companies achieve more efficient use of their IT hardware and software investments and provide a means to accelerate the adoption of innovations.

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Web 2.0 Applications among the University Libraries of Karnataka: *An Awareness Study*

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In this paper an attempt has been made to draw the different ideas and application of Web 2.0 technology in univeristy libraries. There is a list of web 2.0 tool which has the potential to serve and apply in the library world. Most of these tools have the potential to keep library more relevant to a whole new generation and to bring about interesting changes in the way that library services can provide.



Web 2.0, blog, wiki, library 2.0,

1. Introduction

It's a story about community and collaboration on a scale never seen before. It's about the cosmic compendium of knowledge Wikipedia and the million-channel of people's networks, YouTube and the online metropolis MySpace, facebook etc. It's about the many wresting power from the few and helping one another for nothing and how that will not only change the world, but also change the way the world changes. Since the time, Web 2.0 has found a place in the lexicon; the Global Language Monitor recently declared it to be the one-millionth English word. The technologies such as *wiki, blogs, RSS,* and *folksonomies* that build *Web 2.0* present an opportunity to share knowledge and facilitate interactions between users and computers. Web 2.0 has been strongly applied in the field of e-commerce, online advertising and other online services. Web 2.0 personal web-pages are evolving into blogs, encyclopaedias into Wikipedia, text-based tutorials into streaming media applications, taxonomies into folksonomies, and question-answer/email customer support infrastructures into instant messaging (IM) services.

2. Web 2.0

Tim Oreilly and Dale Dougherty Oreilly coined the term Web 2.0 in 2004 and they define the term as "applications that make the most of the infinite advantages of that platform delivering software as a continually updated service that gets better as more people use it consuming and remixing data from multiple sources including individual users while providing their own data and services in a form that allows remixing by others,"

The Web consists of diverse information collections in terms of the type of content, context, format and quality. However, this diversity, as good as it is, often brings challenges for users in their web information seeking activities. The web 2.0 technologies have just created a new wave of technological applications in libraries, and also attracted the attention of researchers, scholars and the library community. Libraries in U.S, U.K and other western countries have made steadily increasing efforts to equip their traditional library websites with more 2.0 elements.

3. Library 2.0

The impact of the Web 2.0 term can be seen by the subsequent popularity of the '2.0 meme' in other sectors. Terms such as e-Learning 2.0, Library 2.0 and Enterprise 2.0 have been coined with definitions provided in Wikipedia (http://wikipedia.com). These terms have clear links with the Web 2.0 term, describing the application of Web 2.0 principles and use of Web 2.0 technologies, within the content of e-learning, library and enterprise uses.

The term Library 2.0 is coined by Michael Casey in his blog Library Crunch which debuted on September 2005. He defined the term in his blog as "Library 2.0 as the application of interactive, collaborative, and multi-media web-based technologies to web-based library services and collections". He evolved the following features of Library 2.0

- It is user-centred. Users participate in the creation of the content and services they view within the library's web-presence, OPAC, etc. The consumption and creation of content is dynamic, and thus the roles of librarian and user are not always clear.
- It provides a multi-media experience. Both the collections and services of Library 2.0 contain video and audio components.
- It is socially rich. The library's web-presence includes users' presences. There are both synchronous (e.g. IM) and asynchronous (e.g. wikis) ways for users to communicate with one another and with librarians.
- It is communally innovative. This is perhaps the single most important aspect of Library 2.0. It rests on the foundation of libraries as a community service, but understands that as communities change, libraries must not only change with them, and they must allow users to change the library. It seeks to continually change its services, to find new ways to allow communities, not just individuals to seek, find, and utilize information.

4. Need for the Study

- Unfortunately, the Library 2.0 experience is not being equally experienced by all libraries in the world, particularly those in the developing countries. While the literature is replete with success stories from libraries that have adopted Library 2.0, this concept is still new to some libraries in developing countries. Although most library system today is bundled with 2.0 technologies, librarians in developing countries are still at the early stage of getting themselves familiarized with the 2.0 tools such as instant messaging, podcasting, blogging, and social networking. Miller (2005) had warned on the possible 'by passing' of the libraries, as users are more in tune with online resources such as Wikipedia, Google, Amazon, or Ebay which are more responsive and appealing to their needs. As such, libraries in developing countries must act fast to reap the potentials of Library 2.0.
- The study explores the status of application patterns of web 2.0 technology in the university libraries of Karnataka. And also this study aims to find out the perception and acceptance of the technology and challenges to implementation in libraries.

5. Objectives of the Study

- To identify the Web 2.0 applications in university libraries.
- To examine the purpose of web 2.0 use in university libraries.
- To investigate the features of web 2.0 in university libraries.
- To explore the awareness of web 2.0 technology.
- To study the information seeking pattern of the users of university libraries in library 2.0 environments.
- To identify the problems occurred in implementing the web 2.0 in university libraries.
- To evaluate the implemented library 2.0 services in university libraries.
- Research Methodology and Limitations of the Study
- The current study uses content analysis of library websites as the research method. The catalogues and each page of the libraries' websites were evaluated for the presence of tools or services that reflect the principles of Web 2.0. Examples of these tools and technologies include RSS feeds, blogs, wikis, instant messenger, social networking services (SNS) and web browser tools, tagging cloud, text alert, podcasts, videocasts and OPAC 2.0 to explore the awareness and perceptions of the applications of web 2.0 technology.
- As it is going to discuss there are many web 2.0 features applicable to university libraries. This study is limited to the few applications such as OPAC 2.0, RSS, BLOG, Social networking service, Wikis and

Tagging, to study the impact of web 2.0 technology on libraries the research area selected is the university libraries of Karnataka. There are around 35 universities in Karnataka in all disciplines.

- **Library 2.0 Tools:** There is a list of web 2.0 tool which has the potential to serve and apply in the library world. Most of these tools have the potential to keep library more relevant to a whole new generation and to bring about interesting changes in the way that library services can provide.
- **Synchronous Communication:** In synchronous communications, the sender and receiver must synchronize with one another before data is sent. This technology has already been in use in the library community. The synchronous communication widely known as instant messaging (IM), it allows real-time text communication between individuals. Libraries have begun employing it to provide "chat reference" services, where users can synchronously communicate with librarians much as they would in a face-to-face reference context.

  Libraries may do well to continue adopting this technology as it evolves, as it allows reference services in an online media to closely approximate the more traditional services of the physical library. The time will certainly soon come when web reference is nearly indistinguishable from face-to-face reference; librarians and users will see and hear each other, and will share screens and files. In addition, the transcripts these sessions already provide will serve library science in ways that face-to-face reference never did. For the first time in the history of libraries, there will be a continuously collected transcription of the reference transaction, always awaiting evaluation, analysis, cataloging, and retrieval for future reference.
- **Content Delivery:** Content delivery describes the delivery of media "content" such as audio or video or computer software and games over a delivery medium such as broadcasting or the Internet. The technologies are used to Content Delivery are:
  - RSS Feeds
  - HTML Feeds
  - Streaming Media
  - Podcasting
  - Vodcasting
  - SMS enquiry service
- **RSS:** RSS stands for RDF Site Summary or Really Simple Syndication is a family of web feed formats used to publish frequently updated works such as blog entries, news headlines, audio, and video in a standardized format. The RSS document, which is called a "feed", "web feed", or "channel includes full or summarized text, plus metadata such as publishing dates and authorship. Web feeds benefit publishers by letting them syndicate content automatically. RSS icon in a web browser that is initiates the subscription process. The read checks the user's subscribed feeds regularly for new work, downloads any updates that it finds, and provides a user interface to monitor and read the feeds. RSS feed are used in the library to highlight the new book in the library catalogue, new materials, blog spots and event information. Users can customize catalogue searches by subscribing
- **HTML Feeds:** HTML feeds are basically RSS feeds converted into HTML codes so as to facilitate peer to peer interaction amongst researchers and sharing RSS search results. The HTML codes can be placed on to the web sites and the resulting HTML feed can be customized to compliment the page. HTML feeds allow quicker access information to visiting users. The Elsevier Science has implemented HTML feeds for Scopus, the citation database from Elsevier.
- **Streaming Media:** Streaming multimedia is sequential delivery of multimedia content over a computer network that is displayed to the end user as it is being delivered by the provider. The streaming of video and audio media is an important application that existed before Web 1.0 and finds its application in Web 2.0.

  Library instruction delivered online began incorporating more interactive, media-rich facets. The static text based tutorials are being transformed to multimedia-based interactive tutorials. Another

implication of streaming media for the libraries is that a media is created for the library collections and are provided access to users around the world. There are many websites that offer free streaming video lectures and programs. Software to view streaming is available to download on most sites

- **Podcasting:** Podcasting is a way of making audio or video files available on the internet that can either be listened or viewed on a PC or downloaded to a hand-held device such as an iPod or mp3 player. Podcasting is the process of creating an audio show of some sort available in MP3 format via an RSS feed that supports enclosures. Podcasts are designed to include talk shows, tutorials, music, or other audio content.
- **Vodcasting:** The "VOD" in Vodcasting stands for "video on demand". It is identical to podcasting. While podcasting is to deliver the audio files where as the vodcasting is used to deliver the video content. Like podcast content vodcasts can played either on a laptop or on Personal Media Assistant (PMA).
- **SMS Enquiry Service:** SMS is a mechanism of delivery of short messages over the mobile networks. This service in a library allows users to use their mobile phone to SMS their enquiries to the library. The reference staff deployed to attend such a query can respond immediately with answers or with links to more in-depth answers.

6. Collaborative Publishing Tools

- Blogs and Wikis are called as collaborative publishing tools. These tools do not require any web design and publishing skills, anybody can use these tools for communicating their knowledge.
- **Blogs:** A blog is a contraction of the words web log. Blogs usually provide commentary or information on a particular issue, event or topic. In some cases, blogs can be about a particular person; an online, public, personal diary. A blog is usually maintained by a single person or a small group of contributors. Visitors to the blog can comment on the entries made or respond to comments made by other visitors. Blogs are primarily text but can also be the form of photos or other images, sounds, or films. Blogs may indeed be an even greater milestone in the history of publishing than web-pages. They enable the rapid production and consumption of Web-based publications. In some ways, the copying of printed material is to web-pages as the printing press is to blogs. Blogs are HTML for the masses. The blogs are created in the library to create what is new for users, to post the meetings/conferences output, to market the information sources services and to place the discussion forum.
- **Wikis:** A wiki is a collaborative website that anyone within the community of users can contribute to or edit. A wiki can be open to a global audience or can be restricted to a select network or community. Wikis can cover a specific topic or subject area. Wikis also make it easy to search or browse for information. Although primarily text, wikis can also include images, sound recordings & films. Wikipedia http://en.wikipedia.org the free internet encyclopedia is the most well known wiki.

7. Collaborative Service Platform

Collaborative service platforms are unified electronic platforms that support synchronous and asynchronous communication through a variety of devices and channels. The following are the few examples for collaborative service platforms.

- **Social Networks:** Social network service is web based software that facilitates creation of virtual social networks for communities who share interests and activities. Most social network services are web based interfaces that facilitate community of users to interact with each other deploying tools such as chat, messaging, email, video, voice chat, file sharing, blogging, discussion groups etc. MySpace, FaceBook, Google+, Frappr, and Flickr are some of the social networking service.

- Usage of Social networking in libraries
- Libraries can create a page to reach to new students built the network among the interested group in discussing the common interest.
- Circulating information about the university and its services
- Provide the contact information of similar interest groups

- **Tagging:** In online computer terminology systems, a tag is a non-hierarchical keyword or term assigned

to a piece of information (such as an Internet bookmark, digital image, or computer file). This kind of metadata helps describe an item and allows it to be found again by browsing or searching. Tags are generally chosen informally and personally by the item's creator or by its viewer, depending on the system. Tagging was popularized by websites associated with Web 2.0 and is an important feature of many Web 2.0 services. It is now also part of some desktop software. Tagging essentially enables users to create subject headings for the object at hand. As Shanhi (2006) describes, tagging is essentially Web 2.0 because it allows users to add and change not only content (data), but content describing content (metadata). In Flickr, users tag pictures. In Library Thing, they tag books. By tagging the library collection, users of the library can participate in the cataloguing process of the library. This tagged catalogue would be an open catalogue, a customized, user oriented catalogue.

- **Social Bookmarking services:**Social bookmarking is a method for Internet users to share, organize, search, and manage bookmarks of web resources. Unlike file sharing, the resources themselves aren't shared, merely bookmarks that reference them.

  Descriptions may be added to these bookmarks in the form of metadata, so that other users may understand the content of the resource without first needing to download it for themselves. Such descriptions may be free text comments, votes in favor of or against its quality, or tags that collectively or collaboratively become a folksonomy. Folksonomy is also called social tagging, "the process by which many users add metadata in the form of keywords to shared content". ItList, Blinklist, Clip2, ClipMarks, HotLinks, del.icio.us, Furl, Simpy, Citeulike, Connotea. Stumbleupon, Ma.gnolia, Blue Dot, Diigo etc are some of the popular book marking services. Libraries can make use of social bookmarking sites using RSS feeds for subject disciplines or in areas of specialization relevant to them.

8. Suggestions and conclusion

After an exhaustive search of the universities library of Karnataka the following suggestions has been made for the improvement of library services as well as fulfil their clienteles' information needs.

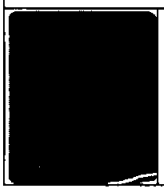
- University libraries of Karnataka should have own maintained library website to implement the web 2.0 applications.
- Almost all universities in Karnataka state is not using and updated the web 2.0 applications for the dissemination of information. It is recommended that to make advanced library as library 2.0 they should adopt and implement the web 2.0 applications.
- A single application of web 2.0 like social networks can perform the many tasks in the faster rate than human being such as new arrival notification, recall reservation, renewal, referral service etc.
- The university libraries of Karnataka should use at least one or the other features of web 2.0 such as blogs, wikis, social networking and social book marking.
- The faculty/researcher/students of the university are also familiar with at least few features like wikis, blogs, RSS feeds and Social networking.
- The university libraries of Karnataka should have infrastructure to implement the web 2.0 features.
- Users and usage of internet is increasing day by day in countries like India, it suggested that by implement web 2.0 applications and provide the services through these technologies.
- The future libraries are virtual libraries, digital libraries, electronic libraries, so this is right time to develop the library 2.0.
- Most of the teenagers are using the SNS, Blogs, Tweeter for information sharing exchange and charting, so it is better to provide the services in the user ways, then only it is possible to keep alive the library services effectively.

It is also suggested that in regards implementation of web 2.0 applications the library should always take initiative the effective use of library services by these applications.

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Web 2.0 – The Future of Libraries

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This article defines a definition and theory for "Library 2.0". It is an introduction for librarians to web 2.0 and social media, and who are interested in using publicly accessible social media tools to serve users in any types of libraries: public, school, special or academic. It suggests that recent thinking describing the changing Web as "Web 2.0" will have substantial implications for libraries and necessitate a new paradigm for librarianship. The paper applies the theory and definition to the practice of librarianship, specifically addressing how Web 2.0 technologies such as synchronous messaging and blogs, wikis, social networks, tagging, RSS feeds, and mash



Web 2.0, Library 2.0, Blog, Wiki, Social network, Photo sharing, folksonomies, Tagging, RSS, Mashup

1. Introduction

Even though Library 2.0 isn't solely about technology, it's useful to know how the 2.0 concept evolved. The phenomenon began outside the library world with the moniker Web 2.0. In simplified terms, Web 2.0 is the next generation of the Internet. It is not so much defined by speed or infrastructure, but how content is created, distributed, and disseminated, and how people interact with that content and each other through a whole new generation of Web platforms and tools. Wikipedia (a Web 2.0 concept in itself) says that the term Web 2.0 is attributed to Tim O'Reilly of O'Reilly Media and refers to a second generation of Internet-based services such as social networking sites (MySpace, Friendster), wikis (collaborative, shared-content sites), communication tools, and folksonomy (shared tagging and labeling, short for "folks" and "taxonomy").

These tools let people collaborate and share information online in previously unavailable ways. Everything to date has been Web 1.0, which consists of static Web sites containing graphics, or perhaps multimedia, and links to other static Web sites. According to Stephen Abram, Web 2.0 is about "conversations, interpersonal networking, personalization, and individualism."

One early adapter to Web 2.0 was amazon.com. Amazon opened its ecommerce site to allow users (not necessarily customers) to add comments about books and products. Amazon allows its users to catalog or add tags to their inventory, making it easier to search. Users can also make lists to combine interests or compile favorites.

2. Library 2.0

The leap from Web 2.0 to Library 2.0 was the term coined by Michael Casey, who first used the term on his blog, Library Crunch. Casey asserts that Library 2.0 will "embrace disruptive ideas". In order to embrace Library 2.0, those who manage and work in libraries must be willing to make significant changes in the way they think and conduct business. This shift will result in taking the traditional library of sterile spaces, static collections, and vanilla catalogs to the next level in a variety of areas.

Essentially librarians have to listen more, trust more, and be willing to relinquish some control to allow customers of all ages and backgrounds to have the best library experience possible. The focus of Library 2.0, however, is not just on technology components. Library 2.0 concepts are just as applicable and important to the building's physical design (for example, comfortable and inviting spaces that encourage excellent customer service). If the focus is only on the technology aspects of Library 2.0, we'll end up with Library 1.5

instead. Library 1.5 would consist of plenty of interesting Web 2.0 technologies with which few people would be familiar, emanating from buildings that have the same look, feel, and customer-service approaches they had before the Internet age.

Thus, "Library 2.0" may be defined as "the application of interactive, collaborative, and multi-media web-based technologies to web-based library services and collections," and it is suggested that this definition be adopted by the library science community. Limiting the definition to web-based services, and not library services more generally, avoids potential confusion and sufficiently allows the term to be researched, further theorized, and renders it more useful in professional discourse.

Library 2.0 is a user-centered virtual community. It is a socially rich, often egalitarian electronic space. While Librarian 2.0 might act as a facilitator and provide support, he or she is not necessarily primarily responsible for the creation of the content. Users interact with and create resources with one another and with librarians.

3. Web 2.0 and library services

Community involvement from participants of all ages is the most important ingredient of almost anything a 2.0 library does. It's about keeping those users you currently serve while actively seeking out those who don't use library services. How can a library be more interactive, collaborative, and driven by community needs without directly asking and involving the community? When it comes to getting teenagers involved, the most successful libraries encourage teen input and assistance from the beginning, and continue encouraging them into young adulthood.

This means involving young adult users in service creation and evaluation, including information gathering, assessment, library planning, and implementation. Participation can come in the form of teen advisory boards, focus groups, committee work, and even teen representatives on the library board. Involvement and input should relate to all areas of the library including technology, customer service, space design, marketing, collection development, programming, and more. Ask teen collaborators about Web 2.0 concepts and ideas. Get their input and their assistance. Since some of Web 2.0 ideas are still foreign and intimidating to many adults working in libraries, teens can often be a great resource for incorporating what's hot and relevant. "Library 2.0" is Web 2.0 applied in the library context. In practice this usually means the library's use and/ or participation in social media platforms (blogs, wikis, photo / video sharing sites etc.).

Young Adults are often the first to try out social media. They also tend to spend significant amount of time in such online networks. More are producing and publishing content online. With a good understanding of social media, librarians can play a proactive role in promoting Digital Literacy. It is anyone's guess what would comprise as the most popular and relevant social networking site for teens. Certainly, not all the services and tools can be listed here. It may even be possible that none of your teen users may find any of the tools relevant for them. Starting a social networking site for your library (e.g. a blog, wiki, Facebook account) is like creating an additional channel for your users. Do consider how you intend to maintain and support that channel. For instance, posting new content, filtering or responding to comments and questions from users. Some of social networking sites are as under:

- RSS (Really simple Syndication)
- Blogs & Wikis
- Social networking sites
- Photo sharing sites
- Audio and Video
- Interactive web services [Instant messaging (IM)]
- Folksonomies, tagging, and tag clouds
- Mashups

3.1 RSS (Really Simple Syndication)

RSS (originally RDF Site Summary, often dubbed *Really Simple Syndication*) is a family of web feed formats used to publish frequently updated works—such as blog entries, news headlines, audio, and video—in a standardized format. An RSS document (which is called a "feed", "web feed", or "channel") includes full or summarized text, plus metadata such as publishing dates and authorship. RSS feeds and other related technologies provide users a way to syndicate and republish content on the Web. Users republish content from other sites or blogs on their sites or blogs, aggregate content on other sites in a single place, and ostensibly distill the Web for their personal use. Such syndication of content is another Web 2.0 application that is already having an impact on libraries, and could continue to do so in remarkable ways.

But libraries have yet to explore ways of using RSS more pervasively. A new product from a company called BlogBridge, BlogBridge: Library (BBL), "is a piece of software that you can install on your own server, inside your firewall. It's not the content of the library (the books), it's the software to organize the library (the building)." While BBL's potential for libraries has yet to be determine due to its being brand new, it is conceivable that this syndication will replace browsing and searching through library websites for content. BBL and similar RSS aggregator applications, installed in a library's system and coupled with the social network of the library, will enable users to have a single, customized, personal library page that syndicates all the library content of interest to them and their research, eliminating irrelevant information. And users will, of course, control that page and that content.

3.2 Blogs and Wikis

A blog (a blend of the term *web log*) is a type of website or part of a website supposed to be updated with new content from time to time. Blogs are usually maintained by an individual with regular entries of commentary, descriptions of events, or other material such as graphics or video. Entries are commonly displayed in reverse-chronological order. *Blog* can also be used as a verb, meaning *to maintain or add content to a blog.*

Much as blogs, Wikis are not of the same reliability as traditional resources, as the frequent discussions of Wikipedia (an online encyclopedia where any registered user can write, amend or otherwise edit articles) in the library world well note; but this of course does not eliminate their value, it merely changes librarianship, complicates collection development and information literacy instruction. The lack of peer review and editorship is a challenge to librarians, not in that users should avoid wikis, but only in that they should understand and be critical in depending on them. Wikis as items in a collection, and the associated instruction of users in the evaluation of them, are almost certainly part of the future of libraries.

In addition, a library wiki as a service can enable social interaction among librarians and patrons, essentially moving the study group room online. As users share information and ask questions, answer questions, and librarians do the same within a wiki, a record of these transactions is archived perhaps for perpetuity. And these transcripts are in turn resources for the library to provide as reference. Furthermore, wikis and blogs will almost certainly evolve into a more multi-media environment as well, where both synchronous and asynchronous audio and video collaborations will take place. Blogs are new forms of publication, and wikis are new forms of group study rooms.

Ultimately, blogs and wikis are relatively quick solutions for moving library collections and services into Web 2.0. This beginning of Library 2.0 makes collections and services more interactive and user-centered, enable information consumers to contact information producers and become co-producers themselves.

3.3 Social Networks

A social network is a social structure made up of individuals (or organizations) called "nodes", which are tied (connected) by one or more specific types of interdependency, such as friendship, kinship, common interest, financial exchange, dislike, or relationships of beliefs, knowledge or prestige.

Social networks are perhaps the most promising and embracing technology discussed here. They enable messaging, blogging, streaming media, and tagging. MySpace, FaceBook, Del.icio.us, Frappr, and Flickr are networks that have enjoyed massive popularity in Web 2.0. While MySpace and FaceBook enable users to share themselves with one another (detailed profiles of users' lives and personalities), Del.icio.us enables users to share Web resources and Flickr enables the sharing of pictures. Frappr is a bit of a blended network, using maps, chat rooms, and pictures to connect individuals.

Other social networks are noteworthy as well. LibraryThing enables users to catalog their books and view what other users share those books. The implications of this site on how librarians recommend reading to users are apparent. LibraryThing enables users, thousands of them potentially, to recommend books to one another simply by viewing one another's collections. It also enables them to communicate asynchronously, blog, and "tag" their books.

3.4 Photo sharing Sites

Photo sharing is the publishing or transfer of a user's digital photos online, thus enabling the user to share them with others (publicly or privately). This function is provided through both websites and applications that facilitate the upload and display of images. The term can also be loosely applied to the use of online photo galleries that are set up and managed by individual users, including photoblogs. Sharing means that other users can view but not necessarily download the photos, users being able to select different copyright options.

The first photo sharing sites originated during the mid to late 1990s primarily from services providing online ordering of prints (photo finishing), but many more came into being during the early 2000s with the goal of providing permanent and centralized access to a user's photos, and in some cases video clips too. Webshots, SmugMug, Yahoo! Photos and Flickr were among the first. This has resulted in different approaches to revenue generation and functionality among providers.

If academic libraries hope to support current and evolving information-seeking behaviors, they must integrate into their users' network-based workflows by exposing as much content as possible to search engines, making it discoverable where users are most likely to be working. For example, many academic libraries are exposing their holdings data to web crawlers from Google and other search engines through the OCLC Open WorldCat program, generating substantial traffic (or "click-throughs") back to local library catalogs.

3.5 Audio and Video

The term Audio-Visual (AV, or A/V) may refer to works with both a sound and a visual component, the production or use of such works, or to equipment used to create and present such works. Slide tape presentation, films and television program are examples of audio-visual presentations. Once audio-visual media came into existence, it became a part of people's everyday lives within a few decades

The streaming of video and audio media is another application that many might consider Web 1.0, as it also predates Web 2.0 thinking and was widely employed before many of the following technologies had even been invented. But for reasons similar to synchronous messaging, it is here considered 2.0. Certainly, for libraries to begin maximizing streaming media's usefulness for their patrons, 2.0 thinking will be necessary.

As mentioned, library instruction delivered online has begun incorporating more interactive, media-rich facets. The static, text-based explanation coupled with a handout to be downloaded is being supplanted by more experiential tutorials. The Association of College and Research Libraries' Instruction Section provides a database of tutorials, many of which are Web 2.0 in their nature, called Peer Reviewed Instructional Materials Online (PRIMO).

3.6 Interactive Web services

This technology has already been embraced quite rapidly by the library community. More widely known as instant messaging (IM), it allows real-time text communication between individuals. Libraries have begun employing it to provide "chat reference" services, where patrons can synchronously communicate with librarians much as they would in a face-to-face reference context.

Many might consider IM a Web 1.0 technology, as its inception predates the technology market crash and it often requires the downloading of software, whereas most 2.0 applications are wholly web-based. It is here considered 2.0 as it is consistent with the tenets of Library 2.0: it allows a user presence within the library web-presence; it allows collaboration between patrons and librarians; and it allows a more dynamic experience than the fundamentally static, created-then-consume nature of 1.0 services. It is also considered 2.0 as it is becoming a more web-based application, and the software used by chat reference services is usually much more robust that the simplistic IM applications that are so popular (they often allow co-browsing, file-sharing, screen-capturing, and data sharing and mining of previous transcripts).

Libraries may do well to continue adopting this technology as it evolves, as it allows reference services in an online media to closely approximate the more traditional services of the physical library. The time will almost certainly soon come when Web reference is nearly indistinguishable from face-to-face reference; librarians and patrons will see and hear each other, and will share screens and files. In addition, the transcripts these sessions already provide will serve library science in ways that face-to-face reference never did. For the first time in the history of libraries, there will be a continuously collected transcription of the reference transaction, always awaiting evaluation, analysis, cataloging, and retrieval for future reference.

3.7 Folksonomy, tagging, and tag clouds

A folksonomy is a system of classification derived from the practice and method of collaboratively creating and managing tags to annotate and categorize content; this practice is also known as collaborative tagging, social classification, social indexing, and social tagging. *Folksonomy*, a term coined by Thomas Vander Wal, is a portmanteau of *folks* and *taxonomy*.

Folksonomy became popular on the Web around 2004 as part of social software applications such as social bookmarking and photograph annotation. Tagging, which is one of the defining characteristics of Web 2.0 services, allows users to collectively classify and find information. Some websites include tag clouds as a way to visualize tags in a folksonomy. A good example of a social website that utilizes folksonomy is 43 Things.

Tagging essentially enables users to create subject headings for the object at hand. As Shanhi (2006) describes, tagging is essentially Web 2.0 because it allows users to add and change not only content (data), but content describing content (metadata). In Flickr, users tag pictures. In LibraryThing, they tag books. In Library 2.0, users could tag the library's collection and thereby participate in the cataloging process.

Tagging simply makes lateral searching easier. The often-cited example of the U.S. Library of Congress's Subject Heading "cookery," which no English speaker would use when referring to "cookbooks," illustrates the problem of standardized classification. Tagging would turn the useless "cookery" to the useful "cookbooks" instantaneously, and lateral searching would be greatly facilitated.

Of course, tags and standardized subjects are not mutually exclusive. The catalog of Library 2.0 would enable users to follow both standardized and user-tagged subjects; whichever makes most sense to them. In turn, they can add tags to resources. The user responds to the system, the system to the user. This tagged catalog is an open catalog, a customized, user-centered catalog. It is library science at its best.

3.8 Mashups

Mashups are perhaps the single conceptual underpinning to all the technologies discussed in this article. They are ostensibly hybrid applications, where two or more technologies or services are conflated

into a completely new, novel service. Retrivr, for example, conflates Flickr's image database and an experimental information architecture algorithm to enable users to search images not by metadata, but by the data itself. Users search for images by sketching images. In some ways, many of the technologies discussed above are mashups in their very nature. Another example is WikiBios, a site where users create online biographies of one another, essentially blending blogs with social networks.

Library 2.0 is a mashup. It is a hybrid of blogs, wikis, streaming media, content aggregators, instant messaging, and social networks. Library 2.0 remembers a user when they log in. It allows the user to edit OPAC data and metadata, saves the user's tags, IM conversations with librarians, wiki entries with other users (and catalogs all of these for others to use), and the user is able to make all or part of their profile public; users can see what other users have similar items checked-out, borrow and lend tags, and a giant user-driven catalog is created and mashed with the traditional catalog. Library 2.0 is completely user-centered and user-driven. It is a mashup of traditional library services and innovative Web 2.0 services. It is a library for the 21st century, rich in content, interactivity, and social activity.

4. Managing risks

The advantage of Web 2.0 services is that many of them are free to use. Or you may only need to pay a small fee to use additional services. But it also means that you do not have direct control over how the service and its policies are managed (e.g. the advertisements displayed on your page).

Another potential risk is that the service may be terminated or its terms modified without consulting or informing you. You need to consider if you need other ways to backup your content.

Many of the social networking sites require you to login with your user account and passwords. Keep your passwords safe. If you intend to add other collaborators/ editors/ administrators to your social networking page, a good practice is to include them as individual user accounts rather than share your user account and password. Web 2.0 may seem like having its own set of norms and culture. But generally, the rules and practices of good communication apply. Like the typical advice for managing email risks, never post anything on the Internet when you are angry! And you might as well assume there will be copies of your text, image, audio or video circulating online even long after you have removed the content.

Being "open" in Web 2.0 tends to mean adopting an attitude of sharing, taking time and effort explain and respond to comments often in a more personal way (as opposed to stiff and formal corporate statements). It also means being willing to publicly acknowledge your mistakes. However, the guidelines and policies of your professional body and/ or employer will always apply (e.g. professional conduct, public communication). People do not get into trouble for using Web 2.0 per se. They get into trouble for their inappropriate actions and words.

5. Conclusion

All together, the use of these Web 2.0 technologies and applications, along with others not here mentioned and others not yet invented, will constitute a meaningful and substantive change in the history of libraries. The library's collection will change, becoming more interactive and fully accessible. The library's services will change, focusing more on the facilitation of information transfer and information literacy rather than providing controlled access to it. This paper posits four conceptual underpinnings to Library 2.0: it is user-centered; a multi-media experience; socially rich; and communally innovative. It also espouses a focused definition for the term: "The application of interactive, collaborative, and multi-media web-based technologies to web-based library services and collections."

The best conception of Library 2.0 at this point in time would be a social network interface that the user designs. It is a personalized OPAC that includes access to IM, RSS feeds, blogs, wikis, tags, and public and private profiles within the library's network. It is virtual reality of the library, a place where one can not only search for books and journals, but interact with a community, a librarian, and share knowledge and understanding with them. Library 1.0 moved collections and sparse services into the online environment, and

Library 2.0 will move the full suite of library services into this electronic medium. The library has had a web-presence for many years, and with Library 2.0, its patrons will be joining it.

While Library 2.0 is a change, it is of a nature close to the tradition and mission of libraries. It enables the access to information across society, the sharing of that information, and the utilization of it for the progress of the society. Library 2.0, really, is merely a description of the latest instance of a long-standing and time-tested institution in a democratic society. Web 2.0 and libraries are well suited for marriage, and many librarians have recognized so.

Library 2.0 is not about searching, but finding; not about access, but sharing. Library 2.0 recognizes that human beings do not seek and utilize information as individuals, but as communities. It is, finally, also necessary to consider that the Web will continue to change rapidly for some time. Web 2.0 is an early one of many. Libraries must adapt to it, much as they did the Web originally, and must continually adapt for the foreseeable future. In this "perpetual beta" (O'Reilly, 2005), any stability other than the acceptance of instability is insufficient.

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Web2.0 -Mashup in Library services

Shilpi Verma **Kunjan Prasad Gupta**

Abstract

Mashups are Web applications that combine data and content from more than one source of data according to user need. It is application of web2.0 and a"programmable web" in various library services. this paper discusses is the issues and challenges, types, Architecture and use of mashup in various library services as well as some minimum technical details also.

Web2.0, Mashup, Types of Mashup, Application in library Services

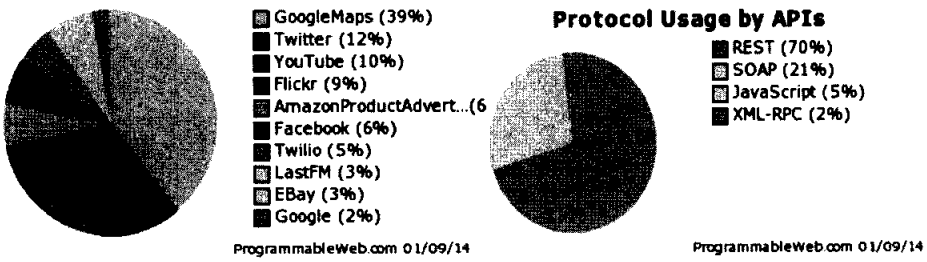
1. Introduction

The term web2.0 was given in 1999 by Darcy DiNucci and it became popular by the efforts of Tim O' Reilly in Tim O'Reilly Media Web 2.0 conference in late 2004. A Web 2.0 site may allow users to interact and collaborate with each other in a social media platform and as a creater of content which is actually generated by user with the help of advanced technology and application of blog, wiki, social bookmarking Ajax, podcast, MySpace.Flickerect. It is also known as user participation application.

2. Mash up

The Origin of the term mash up from the the pop music where people seamlessly combine music from one song with the other song and generate a new song or a Remix Music, in context of library mashup is a web application which collects various open and in the case of commercial sources with the permission of the owner of the source and remix that source generate a new type of service called mash up for example with the help of Google maps and other additional information about the organizational information we generate a map mash up, repository map mash up, another we create a new way of resource sharing media, library cooperation etc. Library 2.0 is kind of a mashup. It is a hybrid of various social media like blogs, wikis, YouTube, content aggregators, flicker and social networks. Library 2.0 is application of web 2.0, it is directly participation of user in various services, It allows the user to edit OPAC data and metadata, saves the user's identity, and the user is able to make all or part of their profile public; users can see what other users have similarity between those profile and checked-out, borrow and lend, and a common user-driven catalog is created and mashed with the traditional catalog.

- **Top Mashup Tags:** **Last 14 daysSee all time**



Source: Programmableweb.com

3. Issue and Challenge for the Development of Mashup

There are various issues and challenges that are involved in the development of Mashup: these are as follows:

- Copy Right management
- Open Contents availability
- Restrictions of Social Media in various academic library
- Lacks of Sufficient IT knowledge and Infrastructure
- Unlearning desire of old employee in IT environment
- Lack of security of user data as well as library data
- Programing language

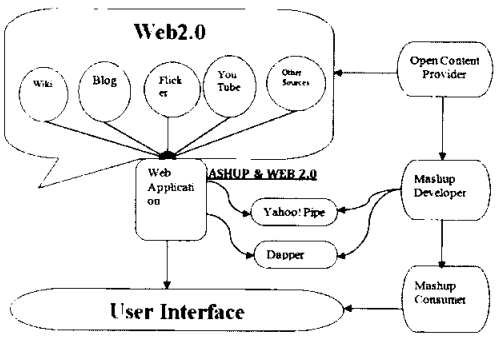
4. Types of Mashup

We categorized mashup on the basis of availability of the content. The categories are as follows:

- **Mashup**:- Free Mashup means that types of mashup which Content is freely available on the web, we merged that Content and generate a new types of information based services for example Map Mashup, Video Mashup, Catalogue mashup etc.
- **Commercial Mashup**: Many organization that provide your data only for the Commercial purpose on the basis of agreement or mutual cooperation.

5. Mashup Architecture

- **The Content Provider**:- it is provide various open and commercial data. Which is using API and Different web Protocols such as RSS, REST, SOAP and other Social Media.
- **The Mashup Developer site**: It is web Application that is merged that sources of information and generate new types of information service with the help of Yahoo! pipe, Dapper which is helpful for the piping of that sources to another Sources. On the other hand mashups can be implemented similarly to traditional Web applications using server-side dynamic content generation technologies like Ajax, CGI, PHP or ASP.
- **User Interface** :- User Interface is the most important part of the Mashup because without user interface user can't interact and access that information from the developer of mashup, mashup developer should be aware of programming language if developer is not aware programming language then no problem because various mashup interface already available as a open source like www.programabe.com.



6. Application of Mashup in library Services

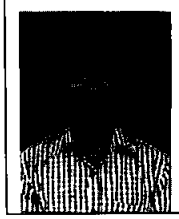
- **Library Location**:-With the help of Google map we can create a map mashup by adding a map link to your library location page and the basic information about your library generate a library map mashup and display basic information about the library such as library location, library hour and brief detailed about library also.
- **Display Library Catalogue**: - We can provide a new way of displaying catalogue card with the help of OPAC and Google book review like we displayed book review and bibliographical information of a book in a common window with the help of mashup, which is more helpful to the library user for Example OCLC WorldCat.
- **Library extension Service**:- Library extension service is most important service of a library because library is a service organization and the basic objective of library is maximum use satisfaction and normally we provide various services which is helpful to the awareness of user about the Library services and promote your library services for example with the help of mashup we merged various book cover on amezan.com and piping that book to your library in library catalogue and update user directly with the help of RSS.
- **Resource Sharing**:- Resource Sharing is a little part of Library Cooperation means share resources like manpower books etc. within various organization on the basis of mutual understanding , Mashup means mashing various open and commercial resources in a single window in context of library we perform various common services if we perform that services in a common platform we can save money and resources of library for example Union Catalogue and Centralized cataloguing ,Cloud Computing is a Mashup ,which is done on the basis of mutual Cooperation by Various organization.
- **Current Awareness Service** : - CAS means provide current information about the area of interest of user and update your user with the help of Table of Content, news Paper Clipping, Routine of periodical etc. for example a user which is post various new arrivals book covers on your blog and with the help of RSS we generate a catalogue search of various library and user can search that arrivals quickly.
- **Directly User Participation**:- with the help of various social media user directly participate library function he or she directly given our opinion and show your personal collection with the help of facebook, blog, Wiki MySpace, Flicker etc. like
- **Repository Map**:-Combine data from repository From Different Data Provider and mashup it With the Google map in Order to Visually Displayed Information In a Common Platform.
- **Selective dissemination of information service**:- Mashup is a combination of two sources,In SDI service we create separately user profile and document profile and analysis user query and generate index same process done in document profile then matched those profile and satisfied user approached in context of mashup we try to satisfied maximum user approach we gather various sources of information then mashup that sources of information according to user approached which is more satisfactory then simply.
- **Video and photo Sharing**:- With the help of Flicker and Programmable web we mashup that Resources and generate a new value added service for example a mashup might analyze music and poetry lyrics and create a mashup or collection of relevant photos and display social networking graphs based upon common photo metadata.
- **User Education**: - User education is an important aspect for educating and guiding student about library service, in context of mashup we educating your user throw the video which is made combination of various photos of library section and a short time guiding lecture with the help of YouTube Video mashup.

7. Conclusion

So at the last we can say that Mashup is combination of two or more than two sources combined together and generate a new service with the help of Yahoo! pipe, Dapper and other specific protocol like REST, SOAP etc., according to user need. Normally it is based on free source availability and the present environment. Various company commercial organizations provide data for free use to the users. Mashup system are becoming rich from time to time and it is a new Challenge Managing that source and use in library services and it generate a new type of mashup i.e. programmable web mashup. It is a most popular example in present era.

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Why and How to Use Blogs to Promote Your Library's Services

Sanjeev Kumar



Librarians have had to learn how to do a lot with just a little in order to promote awareness of their programs and services. They have seized the opportunities to market libraries in the real world via traditional media: newspapers, corporate newsletters, radio, and TV. Many libraries produce brochures, pathfinders, and their own newsletters. So it is no surprise to see librarians stepping up to the plate and spreading the word online with blogs. Savvy librarians have identified blogs as another means to market libraries and their services



Web Blogs, Library Servics

1. Introduction

The success of a blog depends on blog users actively participating and frequently interacting with each other. The purpose of this study is to investigate the four different perspectives underlying blog usage and to investigate the relative importance of these four aspects identified in previous studies:

- Perceived usefulness;
- Perceived playfulness;
- Habit; and
- Blog identification.

How blog quality influences perceived usefulness and perceived playfulness is also examined. An integrated model for blog usage motivation is formulated and the relative importance of each of the motivators is also examined in the study.

2. Blog

If "blog" is a term that's new to you, don't be concerned. You've probably encountered lots of blogs while using the Web for work or recreation. In fact, blogs existed long before the term was coined. NCSA's what's New[1] page from back in June 1993 is credited as being one of the earliest blogs. In the library sphere, Jenny Levine's Librarians' Site du Jour[2] is considered the original library blog. Blog, short for Weblog, is a Web site that contains brief entries arranged in reverse chronological order. Blogs are diverse, ranging from personal diaries to news sites that monitor developments on anything from Outer Mongolia to copyright law. Evan Williams, the creator of Blogger, describes them this way: "the blog concept is about three things: Frequency, Brevity and Personality."

3. Starting a Library Blog

One of the best things about blogs is that many blogging programs are either free or inexpensive to use. A great way to learn about blogs is to dive in and set up a free account at a service like Blogger, Onclave, or Live Journal and take a test drive. By trying out two or three blogging tools, you'll get a feel for what features you like and don't like. There's nothing like posting some sample entries to help you realize how frustrating a short title entry box can be or how useful a built-in WYSIWYG editor is.

Once you've gotten your feet wet, it's time to think about what type of blog you want to set up. Your first job is to carefully consider your marketing strategy. You need to be sure that a blog is the right tool for the job. Who are you trying to reach, and what are the key messages you want to send? What is the purpose of your blog?

Consider whether your target audience is online in sufficient numbers to make a blog worthwhile. What are the characteristics of your audience? What are your typical readers like? Will they appreciate short, newsy updates that could lead to more in-depth content? In other words, is a blog the right form of online

publishing? Think about how librarian and lawyer blogs have flourished. What do we know about these audiences? Are they wired? Do they like (need) to be in-the-know about new developments, tools, and resources?

Next, you need to decide on the content and scope of your blog. What are the key messages that you want to convey? Are you trying to promote awareness of services and new resources to draw people into the library, or perhaps to encourage the use of virtual services? Or are you trying to serve avid readers better by providing targeted book news and information? Are you looking for a way to be more interactive with certain groups in your community, such as children and youth, who might participate online but not face-to-face?

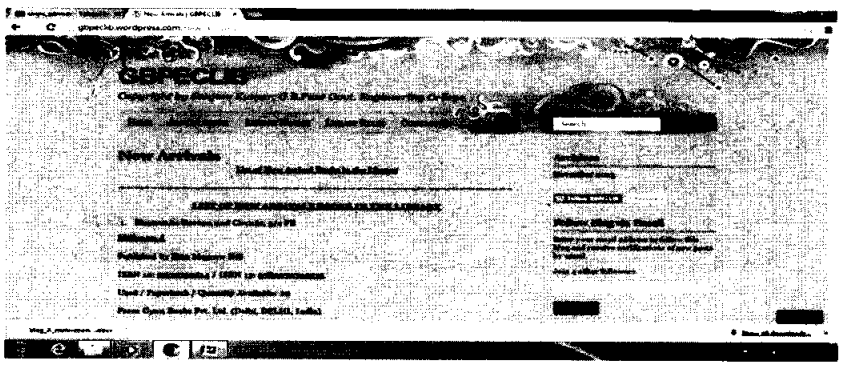
After you have decided on the target audience, key messages, and purpose of the blog, identify project constraints and toolkit requirements. Narrow down the field of dozens of blogging tools to a few by answering three questions:

- Will your library want to install blogging software locally on a desktop or Web server?
- What type of security is necessary? Is the blog available to anyone or is password protection needed? Are there guidelines that mandate that the content must stay within the corporate firewall?
- What features are you looking for in a blogging toolkit?

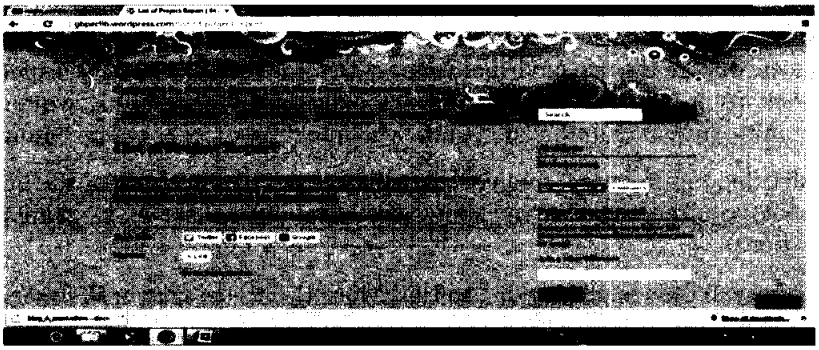
Depending on your situation, using a remote blogging service might be the ideal solution. If your Web developers are overburdened, a remote hosted blogging service that allows you to set up a blog site by filling out a registration form may be just the thing. If you plan to install blogging software locally, you'll need to select software that runs on your library's Web server or desktop computers (Windows, UNIX/ Linux, Macintosh) and use a supported programming language like PHP, Perl, Java, ColdFusion, etc. What if you prefer a blogging program that requires local installation, but that's just not feasible? Don't despair. A number of hosting companies specialize in installing and setting up blogging software and hosting them for you. **(http://www.gbpeclib.wordpress.com)**

4. Promote Library Events

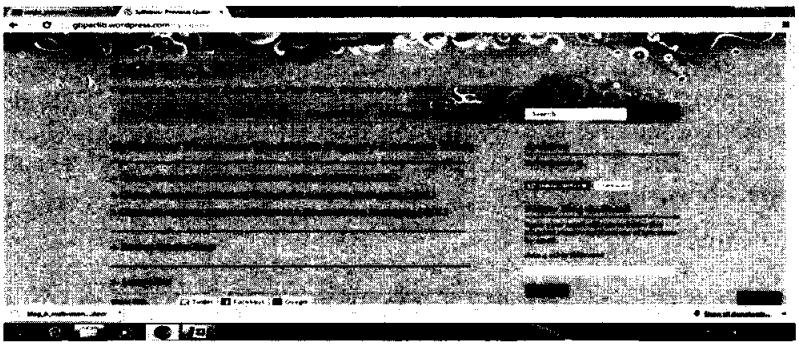
- **Purpose** – There has been an explosive growth of blog usage recently. However, little research has explored the forces motivating people to engage in blog activities. The purpose of this paper is to suggest that the driving forces to engage in blog participation not only include utilitarian motivation (i.e. perceived usefulness) and hedonic motivation (i.e. perceived playfulness) but also habitual Behavior and social identity (blog identification). The quality of the blog is included as an antecedent to perceived usefulness and perceived playfulness.
- **New Arrivals-** Library users can access the list of new arrivals books which come in the library they can access the list from anywhere through the library blog. That is really very beneficial for the library users.



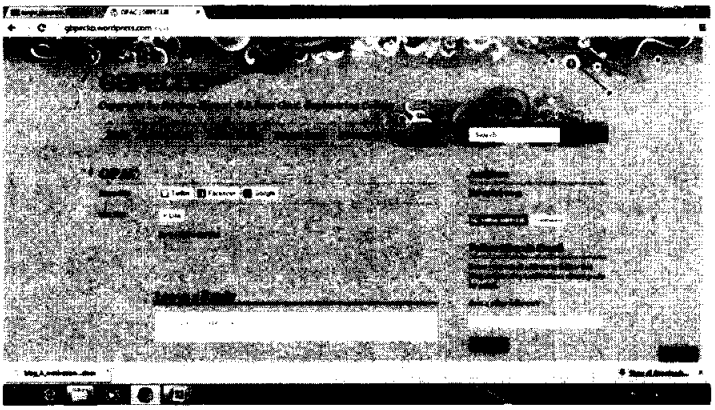
- **Project Report-** Through the library blog user can take the reference of project report. That project report is submitted by the final year students when junior students make project report then they can consider or take the reference from the project list which is given on the library blog.



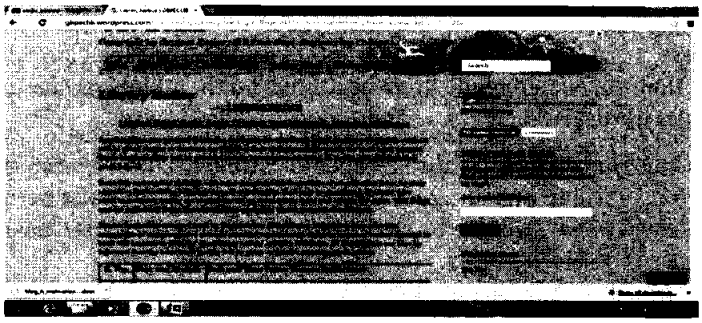
- **Syllabus /Previous Question Paper/ Lecture plan-** Library user can read and take the printout of Syllabus/Previous Question paper and Lecture plan from the library blogs. They do not need to come in the library and take it. They can access anywhere.



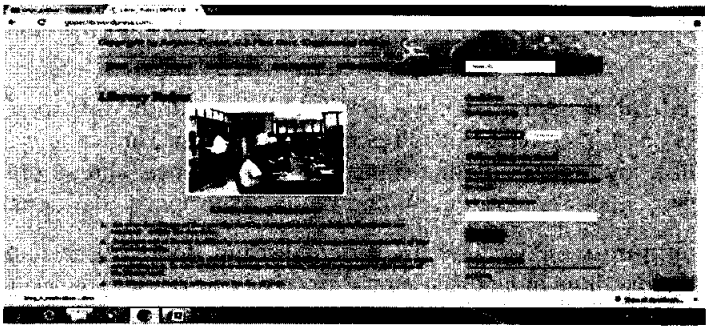
- **OPAC (Online Public Access Catalogue)-** Library user can access the library catalogue from the library blog. They can know which books available in the library or which books not available even they access the e-books also from the library blog. That is really very beneficial for the library users.



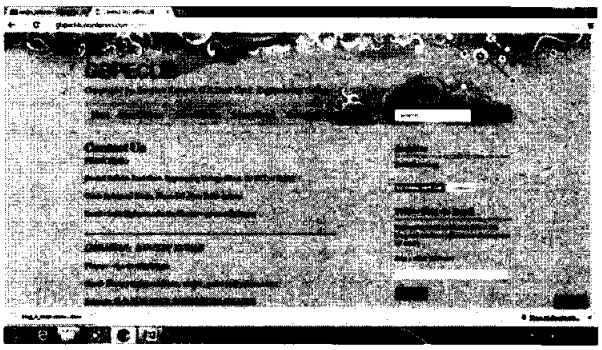
- **Library Notice-** Library users do not need access the hardboard notice of the college or library notice board. Whatever librarian wants the notice regarding the library task he can give on his library blog. Library user can access such type notice from the library blog or he can read library notice anywhere it may be home, it may be college etc.



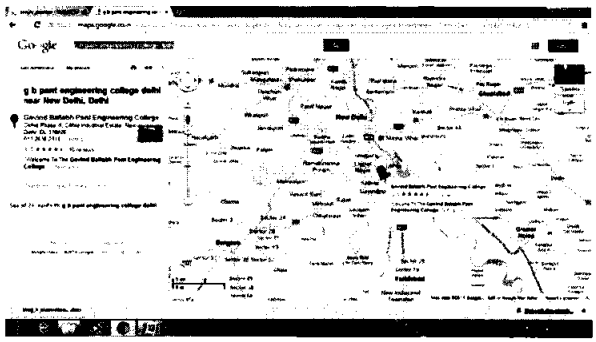
- **Library Rules-** Library users can get the information or rules regarding library from the library blog.



- **Contact us-** Library users or outsider can access the library and college through contact us. In the contact us given address, phone number, e-mail I.D and google map also, through the google map any one can access the college easily.



- Anyone can access library or college through help of Google map.



- **Promote Library Events:** Create a blog that promotes library events and programs. Reach out beyond the visitors to your regular Web site. Set up an RSS feed for your blog and alert everyone in your community that they can include your headlines on their sites or can use an RSS newsreader to see what's up at the library.

E-commerce sites try to turn each visitor into a repeat customer. Libraries can try this too. Put an e-mail subscription form on the blog site and encourage visitors to sign up. This type of permission-based marketing is your chance to send library news straight to the user's in box on a regular basis. It's an opportunity to invite visitors to come back to the library or its Web site over and over again.

Make your blog stand out from the crowd by including some special content that captures readers' interest. For example, include a "quote of the day" from a famous literary work, run a trivia quiz each Friday, or share an interesting fact about your community each week. Some libraries keep lists of "interesting questions and answers" that could be shared. Don't be afraid to develop a unique voice for your blog, whether it's that of a friendly helper that explains mysteries or an authoritative approach that focuses on giving "just the facts."

- **Support Your Dedicated Users:** An obvious hit with most library visitors is finding out what new books, videos, CDs, or DVDs have been added to the collection. Think about setting up topics on your blog for each genre: mysteries, horror, science fiction, romance, and so on. In an academic library, prepare special alerts about new resources and Web sites for particular departments or colleges.
- **Engage Your Community:** Post new book reviews and book award lists. Invite comments and suggestions. Create an online book discussion area by asking readers to recommend books to others.
- **Support Your Community:** Librarians are always looking for ways to offer value-added services. Can you offer a special service with the blog and reach a new audience? A local election news blog that posts announcements about candidate Web sites, nominations, and meetings might be a natural project for libraries that are mandated to make local council minutes and agendas available to the public.

Example Toolkits	Type	Platform	System Requirements	Free or Fee
Blogger and Blogger Pro	Service			Both
http://www.blogger.com				
LiveJournal	Service			Both
www.livejournal.com				
Onclave	Service			Free
http://www.onclave.org				
TypePad	Service			Fee
http://www.typepad.com				
B2	Install		PHP, MySQL	Free, donate
http://www.cafelog.com				
Blosxom	Install	Mac OS X, Win 2k/XP, UNIX/Linux	Perl	Free, donate
http://www.blosxom.com				
Movable Type	Install			Both*
http://www.movabletype.org				
Nucleus CMS	Install	Windows, UNIX/Linux	PHP, MySQL	Free,donate
http://nucleuscms.org				
PMachine	Instal		PHP, MySQL	Both
http://www.pmachine.com				
FogCreek's CityDesk	Desktop	Windows		Both
http://www.fogcreek.com/CityDesk				
Eastgate's Tinderbox	Desktop	Mac		Fee
http://www.eastgate.com/Tinderbox				
RadioUserland	Desktop	Windows, Mac		Fee
http://radio.userland.com				

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7. www.wordpress.com

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Barriers in Information Literacy Programme

Rajesh S.Gedam

Abstract

This Paper is an attempt to bring out the barriers in Information Literacy Programme. Stressing the need for Information Literacy Programme the barriers such as problems related to management of the educational institutions, financial problem, inhibition of the teachers, psychological problems of the users such as students, full-time research workers, teachers and employees have been enumerated. The problem related to the status of the Librarian has been touched as also his inhibition.

Information Literacy, Financial, Psychology, & Management Problems, Government Responsibilities.

1 Introduction

The beginning of the 21st century has been called the Information Age because of the explosion of information output and through variety of information sources. It has become increasingly clear that students cannot learn everything they need to know in their field of study in a few years of college. Information literacy equips them with the critical skills necessary to become independent lifelong learners. Current modern era is a competitive era. In order to survive one has to gain the information about all the happening in the world. Therefore, everyone tries to gain the information from various available sources for variety of reasons. The teachers, students collect the information for study purpose, managers collects it for manage their work. Similarly scientists need it for further research. It means that information is key to success for everyone. The countries which are considered as Advanced Countries are rich in information. Because of their information richness, they have become advanced countries. Every human being and also nation knows the importance of the information. In this information era every nation tries to become a suprimo. Unless and until the nation is not powerful in terms of information, it cannot achieve this target. On this backdrop, government motivates their scientist to engage in the research. Therefore the research output, especially of scientific literature has been increasing exponentially since the second half of the last century. Library in true sense is the power house of the information. This tremendous growth of literature in the various documentary forms is to be managed in the library. It is the responsibility of library professionals to manage, organize and disseminate this information to the needy persons at right time without wasting their valuable time. Information is a valuable commodity. In the present information age, it has a monetory importance. Information Literacy is the solution for this critical problem of access, evaluate and use information from a variety of sources.

In the twenty first century, information literacy has become a crucial issue for the political, economic, social and cultural development in all countries. Information literacy is global phenomenon today. It is information gap that divides the nations and the citizens of a nation into rich and poor. It is information literacy that inclosing this gap.

- **Barriers in Information Literacy Programme**

There may arise different problem in introducing Information Literacy Programme. These problems are enumerated as follows:

- **Problems related to the Organisation/Management/Institution itself**

A Librarian who is incharge of a library, responsible for organizing the library and giving library services to the students and faculty members, researcher or users of the library is accountable for discharging his services and also for Information Literacy Programme. He is the information specialist and manager for library operations and functions.

Responsibility implies delegation of proper authority to transact the assigned business effectively. The business of the college library is to oraganise the library resources and services. But practically Librarian has no freedom to take his own decision. For ex. for the governance of the college library many colleges have got a library committee constituted or formed under the college regulations by an executive order for the Principal. It acts as a link between the top management of the college and the Librarian and mostly have recommendatory role. Its recommendations are not final unless duly approved by an appropriate authority. As a matter of Principal, the Principal and the Librarian should be its Chairman and Secretary respectively. The college Librarian occupies key position in its library committee. His active participation in his deliberations will be in the interest of the library and its users because he is accountable for library, organizations, services, execution and follow up action on the decisions taken by the authorities on the recommendation of the library committee.

Unfortunately, the position of the Librarian in library management at many places is like a square peg in a round hole. He is neither delegated with any authority in the college management nor granted even the membership of the library committee. If he is simply expected to bear the responsibilities without any authority commensurate to his position, then he should not be accountable for the decision made by the library committee and other authorities. Hence cooperation of the authorities of the oraganisations has to be secured through persuasion.

- **Financial Problems**

Funds allocated for the library resources, service and staff constitutes the library finance. It may be derived from the parent organization or UGC or any such funding sources, but it needs proper planning, prior assessment of the current and anticipated demands and thoughtful utilization which can be made by a trained and competent librarian only. But it is a matter or experience that the college librarian is quite often neglected in deciding the library finance. The decisions are generally taken at higher level as to what amount should be made available to the library without caring for the stepping prices and periodical subscriptions, requirement of the library users and the library's requirements. But librarian is the only competent persons who is well familiar with the strength and weakness of the library collections requirements of the library users, nature and value of publications, new services to be introduced and the areas of the library which need strengthening. He should plan his requirements well in advance and put up his demands before the appropriate authorities. He should also plan as to how he would utilize the funds made available for the library by the UGC and other sources. Thus his job is very challenging, because he attempts to draw maximum funds in the best possible manner to the utmost satisfaction of the library users as well as authorities. Hence financial problems should not be obstacles in way of librarians.

- **Inhibition of the Teachers**

Many times the feelings of teachers towards the librarian may not always be very encouraging. Faculty members and Researchers in many cases may not agree that a non-teaching staff of the library have anything to teach the teacher. Now a days in every modern library, a well qualified librarian is appointed whose qualifications are not less than the faculty members. In many universities, college librarian's have been granted faculty status. Many teachers do not think of approaching the librarian in case of any requirements for his study and research purposes. This type of psychological inhibition should be removed from their mind by way of some orientation programme specially arranged for the teacher community. The problem of inhibition of the teachers arises because of failure of teacher training instruction to include in their basic training programme. An adequate understanding of the function of the school library, college library or university library as a learning laboratory and the role of librarian as a fellow teacher is necessary. Secondly, failure of the teachers to expand class knowledge beyond text book contents and class room confines. Thirdly, reluctance of the teacher to pre-plan with the librarian for class or group to use library media, facilities and services before unit is introduced to the class

- **Psychological Problems of Users**

Users Component of the libraries are of the following types :

- **Students:** Students may be school level, under graduate or post graduate levels...
- **Researchers:** Full Time Scholars mostly receive research grants from the different national, International or private organisation and Part-time researchers are mostly working on honorary basis. They are mostly working in the under graduate colleges as whole time teachers.
- **Teachers:** Full time Professors, Readers, Lecturers and Part-Time and Honorary teachers.
- **Employees:** They are not frequent users of the library. The above said categories of users and their requirements are different in nature. Librarian and staff have to face their varieties of requirements and also to make psychological study of each category. For example, Student community is rather shy in nature and they generally do not express their demands before the Librarian. Librarian has to take initiative in this regards by way of personal contact and identify their exact requirements. Secondly, students' community is the prime user in the libraries, The library system of most of the undergraduate colleges is so bad that it fails to attract students to its fold. No uses orientation program is carried on. Naturally their information collecting, handling and usage capacity is very inadequate.
- **Researchers:** Library use patterns of the researchers vary in many ways. There are senior research fellow who are aware of some core document of their subjects and also aware of the library norms, rules and regulations for utilizing library facilities. But in most case it is found that the researchers are not well acquainted with the ordinary document like national indexing and abstracting service, report of conference etc.
- **Teachers:** Changes in teaching pattern, competition for higher posts, impact of information explosion, lead a section of teachers to increasing use of the libraries. But faculty members and researchers in many cases may not agree that a non-teaching staff of the library have anything to teach the teachers. Researchers may also share the same view.

- **Problems Related to the Status of the Librarian**

To introduce any new program one has to face the problem of inertia of rest. The librarian may not be able to overcome the psychological barrier in introducing such a programmer out of his own accord. Cooperation of the authorities of the organization or institution and the faculties has to be secured through precaution in this respect. But to bitter experience some of the researchers and faculties may not find interest in this regards. Their feelings towards the librarians may not always be very encouraging.

- **Inhibition of the Librarian**

To remove the inhibition of the librarian and the library staff and to create an atmosphere conductive to proper library functioning, library association with the assistance of the Government and the authorities concerned may undertake certain programmers, to promote Information Literacy Programmed.

Today Libraries are facing some major barriers in implementing the information literacy programme, notable among them are absence of properly designed curriculum on information literacy, lack of skilled manpower, and low learning motivation of the students and etc.

3. Government Responsibilities:

- Government of the India and the state Government should take initiative to make compulsory provision in the budget of school and college for the library and post of Librarian while granting recognition to them.
- Government has failed to include in the advance course of study either at state or National level, the specific learning experience requiring library support and specific reference to the necessity of intergrading instruction in the use of library within the frame work of teaching learning programmed. This needs correction at the proper level.

4. Conclusion

For intensive exploitation and utilization of information resources adoption of Information Literacy programmed is essential. Management of educational institutions must recognize the importance of libraries and librarians, providing maximum possible financial support to the libraries and giving decision making authority to the librarians.

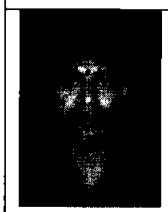
Teachers need come forward by shedding their concept that the librarian cannot teach them the use of library. Teacher should help the librarian to implement the Information Literacy programmers. The librarians should dispel any doubts regarding the implementation of Information Literacy programmes and should work like a salesman in this respect. The student community, research workers and the faculty members should neither feel shy of nor should they feel that the librarian is not competent in guiding them for the use of library resources.

The Universities and the Government should insist upon the Information Literacy programmes in schools and colleges since they usually provide the financial support for building up the libraries.

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Information Literacy of Undergraduate Students: A Study of Selected College

Mahesh M. Dalvi **Daya Dalve (Patil)**



In the fast growing knowledge society information literacy has become one of the most important skills and plays a vital role in helping students to prepare for the rapidly changing complex information environment. A deficiency in information literacy skills has a negative impact on academic performance and professional development of the students. Considering this fact this paper aims to assess the information literacy skills, of the undergraduate students. It concludes by suggesting remedial actions to improve the information literacy level of the students.



Information literacy, *Internet skills, Library skills, Lifelong learning*

1. Introduction

Information literacy, with its emphasis on critical thinking and problem-solving skills as they relate to an individual's information need, has recently been recognized by educators and business professionals alike as fundamental to success in a rapidly changing, technology and information intensive environment (Penny Beile:2005) Information literacy skill plays an important role in academic achievement and lifelong learning. Deficiency in information literacy skills has a negative impact on academic performance and professional development as well. Without these crucial skills students will find it difficult to cope successfully with their academic courses and their knowledge and information up to the demands of employers.

2. Need for the Study

It has been observed that there are major gaps in students' information skills. The students may appear to be more comfortable in technology intensive environments than are their teachers, but it does not necessarily follow that they have adequate knowledge and critical thinking skills to effectively locate filter and evaluate the information.

3. Research Methodology

In order to investigate the existing situation the survey method is adopted to collect the data. A well structured questionnaire was designed and got reviewed by the fellow professionals to judge the content validity and a pilot study was conducted on thirty students. The suggestions were incorporated in the final survey and the revised survey was administered to the selected colleges affiliated to the University of Mumbai to judge the information literacy skills of the students. All together 270 questionnaires were sent to the selected nine colleges. Thirty (10 each from first year, second year and third year students) samples were collected from each college from the present students at the time of data collection.

4. Scope and Limitations of the Study

The study focuses on information literacy skills of the undergraduate students in identifying, locating, searching, accessing, retrieving and using information from both print and electronic sources of information. The researcher has collected data only from the students who were available in the libraries of the selected institutions during the academic year 2011-2012 with the help of local librarians. Only 9 government aided colleges affiliated to the University of Mumbai were selected for the purpose of this study.

5. Analyses of Collected Data

This section analyses 14 questions intended to judge the information literacy competence of the undergraduate students. For the purpose of better understanding the responses received are presented in tables and discussed on various aspects. In order to determine the level of information literacy skills and proficiencies of the students, individual answer to individual question will be discussed.

6. General Library And Information Skills

- **Bibliography:** Students were asked to indicate what information (a list of: countries, phone numbers, information sources, biological weaponry) they will find when using bibliography. The answers are summarised in chart1.

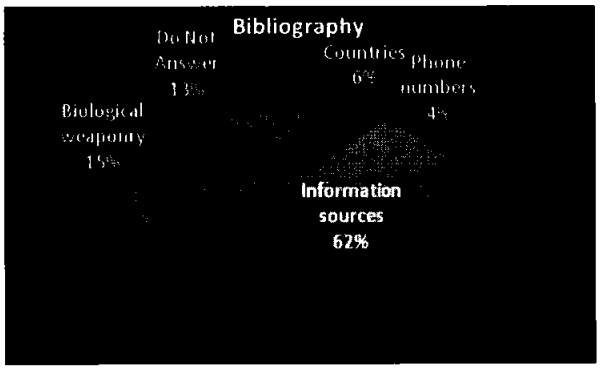


Chart 1

The purpose of the question was to determine if students know what a bibliography is. Significantly 62% students knew that a bibliography is a list of information sources. 15% answer biological weaponry 4% and 6% answer phone numbers and countries.

- **Serial publication:** Students were asked to indicate a serial publication is published on: A) a regular periodic intervals B) weekly C) monthly and D) none of the above Results are recorded in Chart 2.

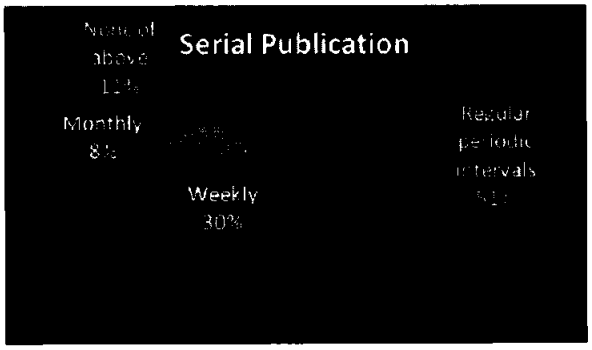


Chart 2

As can be seen from the summarised results in the above chart, 51% students knew that a serial publication is published on regular periodical intervals till 49% students are unaware of it.

- **Most current, recent information:** To assess whether students know that the type of information needed will influence the type of source that you need to use, students had to indicate which of among the following printed source they will consult to find the most current, recent or up to date information on a specific a topic.

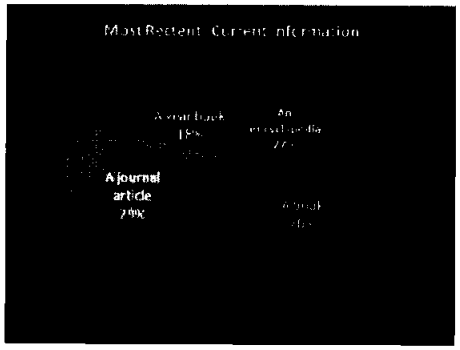


Chart 3

The purpose of the question was to find out whether students are able to differentiate the various document types on the basis of characteristic of information contain. In order to choose appropriate document type students need to be familiar with the information cycle. From the analysis it is clear that only 29% has chosen the correct option journal article, 27% considered encyclopedia as a source of current information, 26% says books and 18% will find it in year book. It seems as if students are unaware of the time span involved in publication of various information sources.

- **Directory:** Respondents had to indicate whether the statement about a directory, namely that it contains addresses and phone numbers, is true or false. Most students (86%) knew the statement is true. This indicates that students are familiar with information sources like phone books. Detailed results are recorded in the following chart.

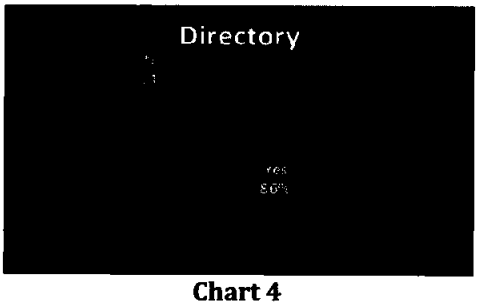


Chart 4

- **Dictionary:** Students were asked to indicate for what purpose they will consult a dictionary. Options given were a journal article, meaning of the word, book on topic. The majority of the students (80%) knew that a dictionary is consulted for meaning of the word but till there are 20% who did not no the use of the dictionary.

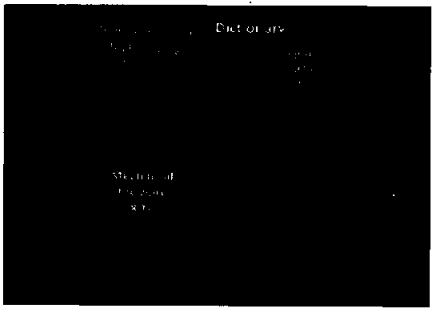


Chart 5

- **Encyclopedia:** Responsents were to indicate where they would look for an introductory information on a particular topic - a dictionary, an encyclopedia, an almanac or a year book. The results are given below.

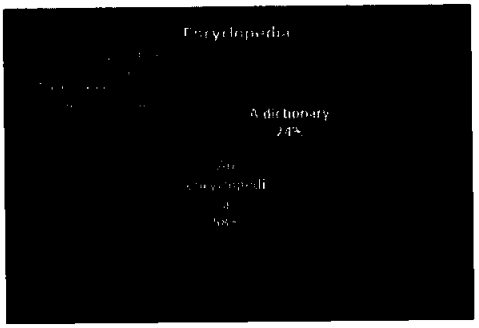


Chart 6

The purpose of the question was to see whether the students know that an encyclopedia can be a source of introductory information on a topic or can be used to get familier with the subject. From the above chart it can be seen that almost one-third of the students did not knew what type source has to consult for particular information. Though 80% students (chart 5) knew that dictionaryis consult for meaning of the word 24% from them did not know the exact use of dictionary.

- **Primary information:** To evalute if they could differenciate between primary, secondary and tertiary source of information students were asked to indicate primary source of information from a research journal, an encyclopedia, a dictionary and a bibliography. The results are listed in the following chart.

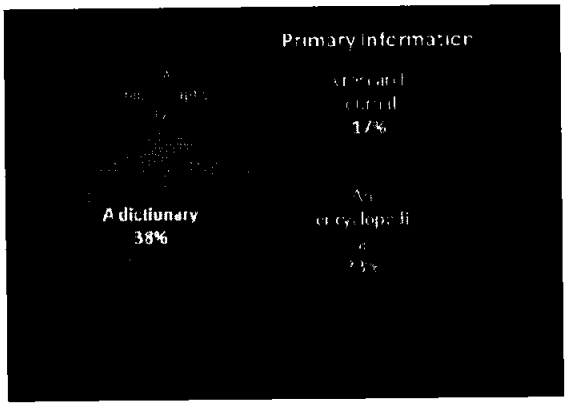


Chart 7

As reflected in figure 2.7 majority of the students considered a dictionary and encyclopedia as primary source of information only 16.66% answer a research journal. It appears that majority of students are unaware of the nature of informatin content of various document types.

- **Geographical source:** To assess the knowledge about geographical sources students were asked to indicate what is Foder's India. It can be seen from the below chart that only 26% students knew that it is a travel guide, majority of the students answer a book on Indian history.

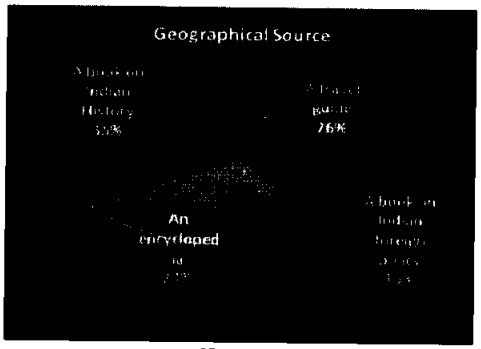


Chart 8

7. Library Catalogue Skills

- **Use of local on-line catalogue:** The first question in the catalogue use skills section intended to test whether students know what information sources can be retrieved by using the on-line catalogue of the college library. Respondents were asked to indicate what information sources the local on-line catalogue of the College Library will retrieve. They had to choose one option from either books in the library, journal published by government, books in the university and none of above.

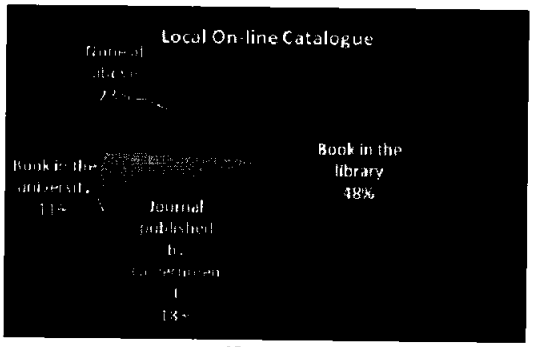


Chart 9

The catalogue is the search tool that the enable library users to find documents available at their library. It is therefore essential that students have a good understanding of the tool. From the summarized results it is clear that the maximum students were of the opinion that the local on-line catalogue of the college library will retrieve books in the college library but there are still 52% students with different opinion.

- **Truncation:** Students had to indicate which truncated keyword will retrieve all of the terms managem manageme, managemem or management. Responses are recorded in table 10:

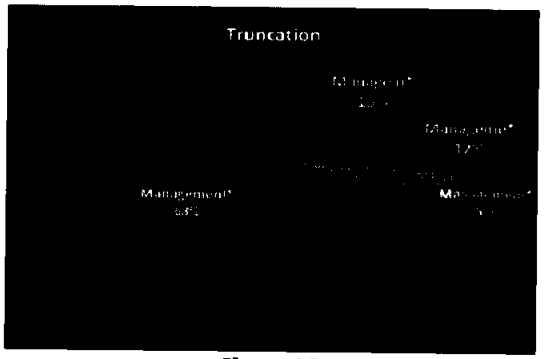


Chart 10

Although only the truncated keyword managem* will retrieve all the listed terms, only 15% of the students have chosen it, 68% choose the option management*. This reflects that the majority of the students did not even know what truncated keyword is.

- **Key words or search terms:** It is a known fact that students find it very difficult to determine key words or concepts - especially if they are from vernacular medium. To test their key word abilities, they were asked to choose from the list of key words for retrieving information on 'Effects of recession on Indian economy'. The options given were 1) Effects, recession 2) Recession, India 3) Recession, Indian economy Effects. The best possible option will be 'recession, Indian economy'.

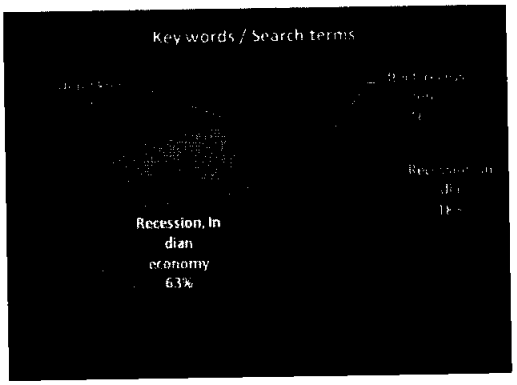


Chart 11

The intention of this question was to examine how respondents choose concepts in their search strategy. Do they hold to the wording to the statement? Are they able to distinguish between significant terms and non-significant terms? More than two-third of the students (63%) choose the best answer still 37% were preferred to search with different key words out of which 16% selected the non-significant term "effect" and 3% did responded to the question.

8. Internet Skills

- **Evaluation of information:** The respondents were asked to indicate how they will personally determine the reliability of internet source. Though government site was the correct option majority of the students (39%) choose the option: the date indicated. Only 34% students knew the fact that government websites are most reliable source of information.

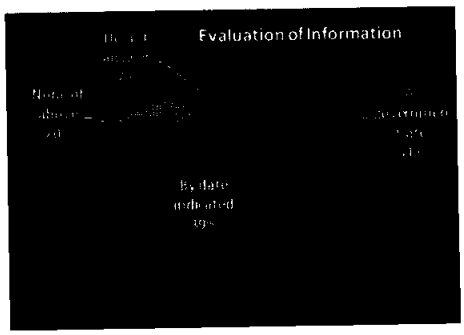


Chart 12

The lack of ability to evaluate and verify retrieved information from the Internet of the undergraduate students' has been reported by many researchers hence students need professional guidance on evaluation of internet information.

- **Boolean logic:** To asssess the students knowledge about different boolean operators the were asked to indicate the correct set of boolean operators from given options. The results are givel below:

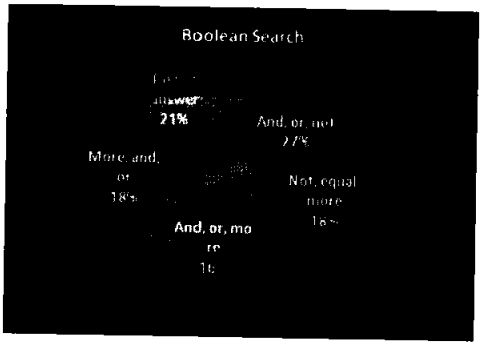


Chart 13

Students need to develop an understanding of Boolean ligic and its use in a search strategy but the table shows that only 27% students choose correct option 'and, or, not' while 21% prefer not to respond as the are not even aware of the boolean operators. It seems as if students are not using these Boolean operators in their search statements and will therefore still find irrelevant information.

- **On-line databases:** Students were asked to choose from four options the one that will describe an on-line database the best. The options given were 1) a collection of website, se accessible via telephone 3) a list of electronic information sources, and 4) a database accessible via the Internet. Responses were as follows:

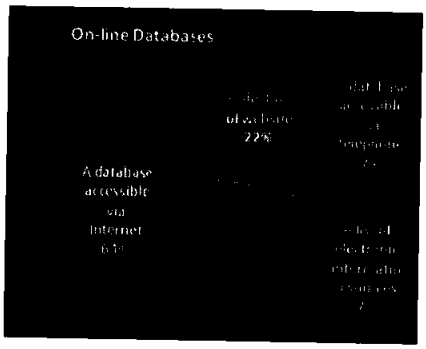


Chart 14

Though 64% students orrectly describe the on-line databases 22% student did not know the difference between a website and on-line database.

9. Observations and Inferences

From the results of the sixteen survey items designed to test baseline information literacy competence of undergraduate level students of Dnyanasadhana College following inferences can be drawn.

Most of the students do not know that:-

- A journal article is a printed source of current information
- Year books are sources of annual facts and events
- A biography is a list of information sources
- A research journal is primary source of information.
- A government sites will always supply reliable information

- A dictionary consist only meaning of the words not introductory information a topic
- A local on-line catalogue of the library will reflect the local libraries holding only
- How to use truncation
- How to use Boolean logics
- What search terms to be used to retrieve the most relevant information
- How to evaluate information and information sources
- Fodor's India is a travel guide

Students thought that: -

- Books and encyclopedias are the information sources with the most recent information
- Reliability of information on internet can be judge by the date indicated
- Local catalogues will reflect all the journals published by government.
- Dictionary and encyclopedia are the source of primary information

Most students knew that

- Directories will supply addresses and phone number
- Dictionaries will explain words
- Serial publications are published on regular periodic intervals
- An online database is a database access via internet.
- A bibliography is a list of information sources

10. Conclusion

The result of the study clearly indicates that though information literacy is a crucial skill in higher education but it has yet to take the desire shape in the colleges affiliated to the university of Mumbai. According to Sun (2002) information literacy is one of the four essential abilities, along with reading, writing and mathematics that students should acquire in higher education. Considering this if the college and university authorities want to ensure that all the students existing in the university system are information literate individuals, it is advisable that all incoming students are submitted to an assessment instrument for testing information literacy. The assessment can be similar or a shortened edition of the questionnaire used for this study. To accommodate large student numbers, an on-line self marking test can be developed.

Academics should also be aware that students will not on their own pick up the necessary information literacy skills. They experience library anxiety and /or information overload and are overwhelmed by the quantity of information available. They find it difficult to construct search strategies to retrieve relevant information, to navigate different information communication technologies and to evaluate and select quality information. Faculty members should inspire students to explore the unknown, offer guidance on how to fulfill information needs and monitor students' progress. The participation of various agencies such as college and university authorities, librarian and teachers is essential.

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Be Sure: Nations Develop with Life-Long-Learning and Information Literacy! Be Aware of Potholes on the Racing Roads!!!

Poonam Choudhary



Gives background of becoming a librarian. Highlights the role of libraries in developing nations though life-long-learning and information literacy, in the countries, like, India, Kenya, Sri Lanka, and many others. Asserts that patches of under-developed groups of society do exist even in the developed countries all over the world. Describes LIS education system as alma mater of librarians. It is the education which nurtures the future generation of librarians. Pleads for removal of weaknesses in LIS education system, for the good health of librarianship. Identifies challenges before the profession. Analyses hidden potholes on the path of growing librarianship. Draws attention of library world to certain glaring gaps left out by the founders of the subject LIS. Laments on the loss of glory and charm of the profession during past five decades or so. Makes us aware of the environmental pressures and some curable mal-practices which have forced their entry in to the noble profession. After diagnosis the ills, suggests remedial treatments.



Life-Long-Learning, Information Literacy, Developing Countries, Librarianship, LIS Education, NILIS, Chartered Librarian

1. Introduction

The main objective of this paper is reviewing the problems faced by Librarians in general, and in particular in the Information and Technology Era. It is also to identify the major challenges for LIS Professionals to work smoothly in cyber environment. Some logical and feasible suggestions would help to overcome the problems and to tackle the challenges. This study is based on review of LIS literature, chatting on face book, personal discussions with library professionals, colleagues and scholars with whom I interacted in seminars, conferences and refresher courses, and gathered their perceptions, opinions and observations regarding the problems and challenges faced by the library professionals, especially in the changed environment of new technology.

The background, narrated as above, has motivated me to present my singled out approach to the subject and librarianship in practice. In this write-up, I present my perception in two parts, namely, **Part-A: 'Truly Said'**, contains a brief of whatever good has been said about the subject or the profession and can be placed before this august body, and **Part-B: 'Untold Story'**, provides certain cautions, I could observe as a learner-cum-practitioner of librarianship. Hence, this paper is all beyond the boundaries of a research paper. But, I submit it for wider consideration by all, only because it is an expression to my sincerity and regards to our noble calling.

2. Part-A: Truly Said

- **India**

Radhakrishnan Commission (1948) has emphasized the importance of academic libraries in such words as "The library is the heart of all the university work, directly or indirectly as regards its education work".

Access to information and knowledge plays a crucial role in transforming a society into a Knowledge Society or Information Society. Libraries have traditionally played a key role in facilitating access to information and knowledge. The working report of the Planning Commission states - No community, institute or organization is considered complete without good library services. The gradual spread of the concept of democracy of socialist pattern of society, the extension of education, the intensification of research activities, the rapid increase in the production of recorded knowledge both in print and non print forms, and vast

innovation in information and communication technology have led to the expression of libraries, information centers and their systems as well as development of their services.

Shri Jagmohan Former Union Minister of Tourism and Culture had once opined - "The Nation That Reads, The Nation That Leads."

Much often, the development programs, and particularly the social development and protection programs, require a network of interconnected players to cover the greatest possible number of beneficiaries and granting them a range of integral services. To meet the challenges in terms of coverage and access to the information and also that the citizens have information and know what benefits they are entitled to, the libraries, especially the public libraries, are the potential source.

The Report of the Working Group on Libraries, 2005 considered the present crucial and important issues for library and information science professionals. The National Knowledge Commission (NKC) had a challenging mandate to transform India of 21st century into a knowledge society. To realize this dream which is also being called 'Mission Impossible', one major all- pervading area which needs immediate and sustained attention is the Library and Information Services (LIS) sector. The stake holders of each area will need well organized and systematic Library and Information Services. The Prime Minister focused in his inaugural speech for the NKC - "Public Libraries are an extremely important element of the foundation of a Knowledge Economy".

- **Kenya:**

During the period 1999-2003, an impressive project was carried out in a rural part of Kenya with a profound aspiration of preparing young citizens for an information intensive future. The basic objective being "If the children are not able to ncome to the library, then the library experience, i.e., books, educational games, computers and all, must be taken directly to where the children are". The Reading Tent Project (RTP) was instituted in November 1999 as an outreach program of the Research & Extension Division at Egerton University. The project was funded by the Rockfeller Foundation and aimed at promoting a lifetime reading culture and improving the reading skills of children in a poor loacality in Africa. RTP events involved teaching elementary reading skills, also with the help of educational games, modeling, drawing and painting. Soon enough a remarkable improvement in the reading habits was manifested.

- **Sri Lanka:**

The World Bank provided credit for two major projects, (1) General Education Project-1, and (2) General Project-2 in the years 1996 and 1997 respectively. The Sri Lankan government has taken development initiatives to the public schools. Under these projects awareness about new concepts, such as, resource based learning, life-long- learning, information literacy, digital literacy, etc

- **NILIS:**

In the year 2004, an 'International Workshop on Developing Information Skills for Learning' was organized by the National Institute Library and Information Science (NILIS), University of Colombo, in collaboration with IFLA/ALP. The Asian problem-solving model 'Empowering 8™ was the outcome of this Workshop. Eight components of Empowering 8™ are

Identify—Explore—Select—Organize—Create—Present—Assess—Apply--*Identify*

The attitude of the Sri Lankan Government towards libraries has been changed in last few years. The government has made several approaches to develop the libraries in Sri Lanka.

A number of studies have revealed that like India, Bangladesh, and Sri Lanka, the other developing countries **Pakistan** (Haider 2003, Mohammad Asghar, 1992 and Khalid Hafiz, 1997), **Nigeria** (Ademodi and

Adepojuu,2009), **Nepal** (Siwakoti, 2008), **Malaysia** (Lee, Brown, Mekis and Singh, 2003), **Iran** (Gavgani, Shokranesh and Shriamin, 2011) and specially in **Afghanistan** (2002) are facing the similar challenges and problems in Library and Information Science. Their Library Associations and Government are trying to stand in the race of Information Technologies with developed countries.

- **Afghanistan:**

In Afghanistan, the library services, education system and other cultural heritage are destroyed, neglected since long time due to Taliban war movements. But, now ALA (American Library Association), Soviet Library Associations, IFLA and other Library and Information Professional Bodies are doing well to rebuild the Library and Information Science in Afghanistan. June 26, 2004, war ravaged Afghanistan opened its first electronic library in the college of Agriculture at Kabul University. This was the result of a collaborative effort between the University of Arizona Library's Federal Depository Librarian Ms Atifa Rawan and the U A Arid Lands Information Center's Director Barbara Hutchinson. (www.icarda.org/Afghaistan/index.html). We salute to Librarian, Atifa Rawan (rawana@u.library.arizona.edu.) who has dedicated to uplift the Library and Information Science in Afghanistan. She told the press in 2002, "There are books with bullet holes. Books were burned. Books are full of dust, most libraries lost their experienced personnel... I would not even call them libraries any more." Since that time and with additional support from the Asia Foundation, The University of Arizona, Canadian Medical Schools and the Library of Congress, that picture has changed. Kabul University and Kabul Medical University are developing into clean and functional libraries. Our Indian Library Association and other trained professionals should take initiatives and help to uplift library and information science in Afghanistan.

3. LIS Education

The generations of library professionals are created by the schools of LIS. If we have to improve the libraries, librarians and the library services, we have to make a critical appreciation of the quality and levels of education and training being given to the would be librarians. Let us have a brief view of LIS education in some of the developing countries, as follows.

A. Dasgupta (2009), Ali and Bakshi explored that LIS profession is facing many challenges such as lack of finance, inadequate infrastructure, lack of knowledge and training, lack of high quality teaching staff, absence of accreditation body and supporting policy at national level etc. In my view that admission test should be conducted before admission in LIS. Syllabus should be up-dated and **one course-one syllabus** at national level means uniformity in syllabus must be followed. Library and Information Science Course should be four-year degree course equivalent to B.Tech. (LIS). Indigenous knowledge and multiculturalism education should be included in LIS education program. Distance learning program in LIS should be shut down at bachelor level because the lack of training, infrastructure, less study materials are declining the standard of LIS education system. Faculty and students should be exchanged for training with good library schools in developed countries like USA, UK.

In 2008, Rahman, Khatun and Islam reviewed the Library Education in Bangladesh. The study found that majority of institutions in Bangladesh have lack of infrastructure, collection of documents, shortage of professionals, financial problems etc. The current syllabus of Dhaka University has a conspicuous lack of computer applications. It spans traditional courses in cataloguing, bibliography and reference, indexing and abstracting, library management and building library collections. Library Association of Bangladesh (LBA) is trying to promote library services, facilities for training of librarianship and research in library science. The United States Information Service (USIS) and the British Council have provided visiting scholars and training courses to expose Bangladesh librarians to other modern systems. Similar assistance has come from Germany, Sweden, Korea and Japan. USIS in Dhaka is responsible for American educational and cultural exchanges with Bangladesh.

There is no uniformity in contents and levels of degrees and programs offered by various departments in LIS. Library education programs are known as either Library Science or Library and

Information Science or Library Management and Information Science or Information Science and Library Management, etc. This causes confusion both in and outside the profession. The University of Rajshahi offers the degree BSS (Hons) and MSS, under the Faculty of Social Sciences. The Royal University of Dhaka offers MSc, where other universities, private or public, offer BA (Hons) and MA under the Faculty of Arts.

Unfortunately in India, we do not witness such revolutions in Library and Information Science Education. There are about nearly hundreds universities and institutions offering LIS course at different levels in India. The course contents for the programmes offered by them are not updated to accommodate latest trends and developments in other fields of ICT and Management Sciences. The otherwise claimed a prestigious school, the DLIS at Delhi University could revise its old course contents in the year 1972 and next revision, only under waves of pressures built and after resistance retired, could take place in the year 2004. Why, because the senior teachers who held the power did not want the new syllabi just to continue to enjoy their teaching work with comforts and at ease. Should they be felicitated as teachers!

Further, there is such diversity in terms of levels, contents, formats and standards across these courses. While many a professional education programs have some standards across these courses, for example Bar Council of India, National Council for Teacher Education, the Dentists Council of India. But LIS has no such standards and recognized agency. Some universities are offering Distance Learning Programs in LIS courses. How would Professionals in LIS without any regular practical training skills stand in the technological age? Therefore, the need of the hour is to establish mechanisms for professional accreditation of LIS education programs, which would perhaps address many of the constraints and challenges confronting the profession.

4. Part-B: Untold Story

- **Challenges**

Jestin and Parameswari (2002) carried out a study and explored the challenges for library professionals in the new millennium in developing countries. It found that librarians have faced challenges due to the introduction of computers and new technology in library and information science. The developing countries are facing more challenges in establishing the digital libraries.

The challenges and problems before LIS are multi-fantastic. The challenges in foresight in a number of areas, such as, library materials, trained human resource, financial resources, sound policy statements, curriculum and nomenclature of awards, networking of rural libraries. School libraries/public libraries, indifferent role of governments, standards and professional accreditation, in-service training, variation in status, pay scales, designation of library workers, application of IT, and such others.

5. Untold Story: Awry Potholes Within LIS Horizons

Herein, at this stage, I wish to share with this august body some such mishappenings as have come to my experience and observation. These facts, though known to many of you, have found little space in library literature, or presented and discussed in library seminars and conferences. Such experiences, though much personal, need to be discussed and dealt with at large to a logical conclusion. Long lasting wisdom of humanity identifies these symptoms in any growing organism at par with black-holes in the sky. These deserve to be properly addressed. I present my diagnosis and describe these, in brief, as follows.

- **Conceptual:** Under this category, I would like to highlight such factors as (1) Putting our professional skills to private practice is not provided. (2) LIS could not provide for specialization in specific areas of libraries, such as, building, furniture, equipment, techniques, methods and procedures. Management Science has done it, such as, MBA in Personnel Management or Financial Management or Marketing Management, etc., and (3) Librarians have not established some character as their Role Model.

Ranganathan enunciated Five Laws of Library Science, meaning thereby that all the resources of the library (also called 'information center' or 'knowledge center') are to be deployed to serve, with excellence and grace, the need of the user ('reader' or 'knowledge seeker' or 'information seeker'). Thus, the relationship between the Knowledge Seeker and Facilitator/Service Provider is that of Master-Servant' relationship. Hence, the Role Model for librarians will be one who possesses the omnivorous attitude for serving the Master. The omnipotent servant must perfectly fit into Master-Servant relationship and should possess the outstanding qualities and preparedness to serve the needs of Master.

- **Once Gained, Since Lost:** May I dare to remember that much of the goodwill, recognition and respect the subject and its practitioners, its service institutions and organizations providing education, training and research earned by LIS, has been lost during last five decades in India. The sheen and attraction for the profession has largely faded badly hurting the Fifth Law – Library is a Growing Organism.
- **Environmental Pressures:** Every institution must respond to environmental pressures, and libraries are no exception. Libraries are service institutions, and they must do more with less. They must regularly make fundamental changes in the ways they operate and are being managed. The emphasis is on improvements in technical systems, organizational structure, staff behaviour and performance, policy statements, decision-making processes, ways of solving problems. This requires executive judgments that combine a library-wide perspective of opportunities and challenges with the application of tools that facilitate change. With the pace of change, the multi-faceted dimensions of organizations, globalization, and the complexity of today's environment, greater attention need to be drawn to library management consultants, who can bring in expertise, additional skills, knowledge and experience into library management.

6. Remedies

Establishing some regulatory and auditing mechanism for working and funding of libraries and LIS schools, be given the top priority. This will help in adding quality and excellence in our professional performance, and will also serve as a check over mal-practices wherever these may exist. Some other steps needed are as follows.

Librarians and LIS professionals should be prepared to learn technical skills, IT skills, and communication skills needed in the changed library environment. Today, both Google and the Open Content Alliance (OCA) are digitizing thousands of books housed in major libraries, making their use open and much wider. Indian libraries should join Google and OCA and get all their books on to the open access platform.

- Four year Degree course should be introduced, as equivalent to B. Tech. in LIS at undergraduate level.
- Distance Learning Programs in LIS up to undergraduate level should be dispensed with.
- All issues related to librarians' pay scales, promotion rules and fringe benefits, etc., be decided by the same panel, committee, Pay Commissions, at par and along with teachers and other categories of personnel.
- Library Acts should be revisited, enacted and implemented in all the States.
- Rural Library Information Center should be setup and services provided in local languages to their users.
- On five yearly gaps, it should be made mandatory for Librarians and Teachers of LIS to go for one month training programs to learn the latest developments in technology and LIS fields.
- Adequate Technical Facilities such as well furnished Internet Laboratory, equipped with modern gadgets for providing digital services to the users must be provided in every LIS School, College and University.

7. Conclusions

'Information is Power' and *'Right to Information'* are the two well settled norms for a knowledge society. These are the basics of education, as also defined by the Great Indian Monk Swami Vivekananda - We want that education by which character is formed, strength of mind is increased, the intellect is expanded, and by which one can stand on one's own feet. The human society since its inception has created, gathered, stored, and disseminated knowledge through a variety of media, including libraries. A library acts as harbinger of knowledge gathering and disseminating information to all.

Lifelong learners need to foster special skills to continue learning throughout their lives. Such an environment is named 'information literacy'. In this context, in the 21st century, the libraries have occupied a key position in the social and cultural set-up of the community in all developed as well as developing countries.

Last, but not the least, I thank you all for allowing me to give a free hand in giving voice to the feelings of the sufferers, we librarians.

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Human Resource Development: *A Continuous Professional Development Programme*

Sanjay N. Wagh **Rajyalakshmi, D**



In the era of Information Communication Technology, library authorities have a pressure for improving quality and quantity of library services. One method of facing these challenges is to have a more efficient and productive staff. In order to maintain and improve efficiency and productivity of the library personnel, there is a necessity of continuous development of skills and knowledge of library personnel and it can be achieved through Human Resource Development (HRD). Present paper defines the term HRD and states the various mechanisms in it.



Human Resource Development, HRD Mechanism, Training and Development, Leadership Development, HRD Climate.

1. Introduction

Human resources amongst all the resources are the most important one because of two reasons. Firstly, other resources are meant to serve human resources and secondly, all the other resources get effectuated by the efforts of human resources. Hence the conservation, motivation, development and utilization of human resources is vital for the growth and development of any organization. In the recent years, far-reaching changes have been taking place in the Library and Information Centers (LIC). Human Resource Development (HRD) is the new tool used in LIC to enrich their services and functions. Library personnel is being constituted as the most important and valuable resource of library based on the belief that library personnel's commitment to work in a library is a fundamental prerequisite for achieving aims and objectives of libraries. Such commitments can be ensured only if actions towards personnel are undertaken with the highest degree of integrity and respect. This presupposes a continues healthy relationship between parent organization and personnel. Consequently HRD places an emphasis on strategic thinking towards personnel skills, their growth and organizational development. Human Resource Development is beneficial to library in following manner.

- Developing people/personnel to become more resourceful and energetic.
- Developing team spirit in organizations and encouraging the personnel to grow and change to be consistent with today's value.
- Enabling individuals to solve complex problem more competently with innovativeness and
- Developing a greater degree of commitment to change in organizations.

2. Need and Purpose HRD

Personnel constitute the most important and vital key to the effective functioning of an organization. Their skills have to be constantly upgraded to handle new tasks to achieve organizational success. Not only employee's competencies and abilities have to be enhanced but their motivation, dedicated involvement, sense of personal participation and above all full commitment to organizational goals, objectives and targets are absolutely essential.

Therefore HRD is necessary for any type of library for

- Survival and stability
- Growth and development

- Change and diversification
- Returning activities to become more effective
- Providing highest quality services

3. Human Resource Development Mechanisms or Subsystems

Any systematic or formal way of facilitating competency, motivation and climate development could be considered as HRD mechanisms. There are many mechanisms that can be used to facilitate HRD. These instruments may be called subsystems or mechanisms or methods. Each of these subsystem focuses on some particular aspect of HRD. To have a comprehensive HRD, many of these instruments may be needed to be used simultaneously. The most frequently used HRD mechanisms are

- Training and Development
- Performance Appraisal.
- Potential Appraisal
- Feedback and Counseling
- Career Planning and Development
- Organizational Development
- Rewards
- Job Rotation
- Team Work / Team Spirit and Team Building.
- Leadership Development
- Job Enrichment

- **Training and Development:** Training is the act of increasing the knowledge and skills of an employee for doing a particular job. The major outcome of training is learning. Trainee learns new habits, refined skills and useful knowledge during the training that helps him to improve performance. Training is mainly job oriented as it enables personnel to do their present job more efficiently and prepare themselves for a higher-level job. Development, on the other hand is concerned with growth of a person in all respects. Training refers only to instructions in technical and mechanical operations whereas development refers to philosophical, theoretical and educational aspects. It is a long-term educational process utilizing a planned and systematic procedure by which managerial personnel acquire conceptual and theoretical knowledge for enhancing general administrative abilities. Training courses are typically designed for a short term stated set purpose, such as Library software training, while development involves a broader education for long run general purposes. On-the-job training & Off-the-job training are two types of training methods.
- **Performance Appraisal:** Performance appraisal is a systematic and objective way of judging the relative worth or ability of personnel in performing his task. Some of the important features of performance appraisal may be stated as
  - **Systematic** - Performance of employees is evaluated in the same manner, using the same methods so that the performance of employees can be compared.
  - **Objectives** - The appraisal is objective, in that it tries to eliminate all subjective factors (bias, favoritism etc.) while evaluating candidates.
  - **Continuous** - The appraisal is carried out on a continuous manner so as to identify the candidates having the potential to assume challenging positions in course of time. The basic purpose is to find out how well personnel are performing the job and establish a plan of improvement.

- **Feedback and Counselling:** feedback and counselling subsystem includes performance feedback, potential feedback, career opportunities feedback, etc. Feedback should be given through counselling sessions. It should enable the individual to identify his strengths and weaknesses so that he will plan a career that suits his potentials. The differences between self-assessment and superior's assessment should be discussed and a programme for further development of the professional should be worked out jointly. Communication of feedback should also be done properly, failing which the all the lofty aims of feedback may be lost in wilderness.
- **Potential Appraisal:** Another subsystem of HRD is potential appraisal.personnel's potential or capability to perform the functions are examined and methods to improve skills are also evolved under this subsystem. The main components in potential appraisal are:
  - Identification of functions in the library and qualities required to accomplish these functions.
  - Methods and instruments to measure these qualities.
  - Continuous assessment of potentiality of each employee to perform upper level roles.
  - Elevation policy and appropriate feedback.
- **Career Planning and Development:** Career planning is "A process of systematically matching career goals and individual capabilities with opportunities for their fulfillment. Career planning encourages individual employees to explore and gather information that enables them to synthesize, gain competencies, make decisions, set goals and take action.[8] Career planning is a slow process and comes as a natural consequence of the organizational culture. Major thrust of the HRD process is the shift in organizational culture towards more honesty, more openness and to improve personal development. Proper career planning could lead to the fusion of "organizations" and "individuals" expectations/goal. HRD can be achieved and strengthened in an organization through this particular tool of management.
- **Organizational Development**: Organizational development (OD) involves mostly structural and technological changes, its main aim is to change people through subordinate participation i.e. changing the nature and quality of their working relationships. Thus OD can be explained as a planed change brought out through the people processes in the organization with the help of the consultant and use of the theory of applied behavioral science. Organizational development is the process of initiating, creating and confronting the needed changes so as to make it possible for organization to become or remain viable, to adopt the new conditions to solve problems, to learn from experience and more towards greater organization maturity.
- **Rewards / Incentives:** An incentive or reward can be anything that attracts an employee's attention and stimulates him to work. In the words of Burack and Smith "An incentive scheme is a plan or programme to motivate individual or group performance. An incentive programme is most frequently built on monetary rewards (incentive pay or a monetary bonus) but may also include a variety of non-monetary rewards or prizes"[10] Rewarding professional performance and behaviour is an important part of HRD. Appropriate honors and rewards not only recognize and motivate personnel, but also communicate the organisations values to the personnel. Innovations and use of capabilities are rewarded in order to encourage the acquisition and application of positive attitudes and skills. Typical rewards include certificate of appreciation, newsletter announcements, additional increments, special privileges etc. Rewards may be given to individuals as well as to teams or department.
- **Job Rotation:** Job rotation refers to the systematic movement of staff from one job to another. It is the periodic shifting of a personnel from one task to another. It involves the movement of staff among different tasks, which will probably be of similar nature. Job rotation creates an opportunity to improve efficiency and productivity in the library, to a great extent it removes monotony and enables staff to acquire more skills. These are the advantages of job rotation. Hence job rotation is useful process for enabling staff to develop.

- **Team Work, Team Spirit and Team Building:** In libraries there are number of sections and in these sections number of individuals are working as a small groups. Librarian should integrate all these groups into one collaborative group. To do this librarian often rely heavily on team building for both individual teams and large groups. Team building encourages team workers to examine how they work together, identify their weaknesses and develop more effective ways of co-operating. Following four ingredients contribute to the development of team work:
    - Supportive environment
    - Skills and role clarity.
    - Super-ordinate goals.
    - Team rewards.

- **Delegation of authority:** Handling personnel is the most critical function. Staff members are sensitive human beings. They have the feelings. They respond to the environment positively or negatively as they wish. Well-managed and well looked after persons are an efficient and effective work- force. In the context of libraries also, how to get best out of them, how to tune them and how to maximize their output is a major problem. This problem can be solved to some extent if the powers are properly delegated with trust. In the library some work is routine and repetitive and many times does not involve financial powers. Such work can be delegated to subordinates to increase the efficiency and speed of work. Also it covers the responsibility and trust on the subordinate staff. It also helps to save the time of supervisory as well as subordinate staff.

  It is desirable that Librarians and section heads should delegate responsibilities to save their own time. Librarian delegates responsibilities to section head and they in turn delegate responsibilities to their assistants.

- **Leadership Development:** Management alone will not bring organizational success. Organizations of all types are discovering that something more is needed which is leadership. If managers are to succeed they must cultivate leadership skills such as commitment to quality and integrity, willingness to innovate and sensitivity to the concerns of others. Any organization can develop leadership skills among employees by giving freedom and responsibility to an innovative employee. Leadership is defined as "a process of influencing the behaviour, actions, attitudes, motives of a group of people and satisfying their needs, aspirations and expectations in the process of achievement of organisational objectives"

  To be effective leaders must learn an entirely new set of skills. A leader is a visionary who imbibes hope with objective enthusiasm that help transforms into reality for an arresting common beneficiary effect.

4. Human Resource Development Climate

In addition to these mechanisms, the HRD process can also be facilitated by creating an HRD climate. A development of climate can be considered as consisting of a culture which supports.

- **Pro-activity:** Employees are action-oriented, willing to take the initiative and show high degree of pro-actively.
- **Openness and risk taking:** Employees feel free to express their ideas and the organization is willing to take risks, experiment with new ideas and new ways of doing things.
- **Collaboration:** Employees collaborate with each other and have a feeling of belonging to the same family and working for a common cause.
- **Trust and authenticity:** Employees, departments and groups trust each other can be relied up on to do whatever they say they will do.

- **Confrontation:** Employees face problems without hiding or avoiding them, these can be discussing with each other and superior.
- **Autonomy:** Employees have some freedom to act independently within the boundaries of their role/job.

Any organization that would like to be dynamic and grow can do so, only by making its employees dynamic and growth oriented. Competence and dynamism of employees require a development climate and implementation of HRD mechanisms and subsystems.

5. Conclusion

Each of the mechanism contributes to the achievement of overall HRD goals. Performance appraisal focuses primarily on identifying the employee's likely future roles within the organization. Training is a means of developing the individual's personal effectiveness or developing the individual's ability to perform his present job role or future job role. Organization development is the mechanism for developing team collaboration and self renewing skills. For synergic benefits of integrated subsystems, the HRD mechanisms should not be thought of in isolation. They are designed to work together in an integrated system, for example the outcome of performance appraisal provides inputs for assessment of training needs, awards, career planning, feedback and performance coaching. HRD mechanisms should lead to the generation of HRD processes like role clarity, performance planning, development climate, risk taking and dynamism in employees. Such an HRD process should result in developing more competent, satisfied and committed people, who, by their contribution would make the organization, grow. Such HRD outcome influence organisational effectiveness.

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- **Challenges**

In this IT era, the role of Librarian as a book keeper or custodian of a library has been undergoing change. Now we call any librarian, document list, etc., as "Information Professionals" who deals with the collection, organization, dissemination, packaging, consolidation of information and facilitates the access to information. The library & Information Professionals of this century will have to deal with the traditional users as well as the new users of the 21st century. They will have to prepare themselves with the latest knowledge of handling the techniques of storage and retrieval of information storage. They will have to face the various challenges as given below-

- New types of users
- New type of subjects with inter-disciplinary approach
- New type of information. for ego Hypertext.
- New types of job. For e.g. networking, database management and information evaluation etc.
- New type of management.
- New tools and techniques of Information Technology.
- New type of work and responsibility.
- New idea and modes of thinking

The growing problem of up-to-date with developments of Information Profession etc. (Deshpande, 2000)

- **Problems and Prospects in IL**

Owing to the importance of information literacy active information literacy programs are under way across the globe. An analysis of the case studies on information literacy originating from different geographical, political, economical, social, cultural, demographic and educational background display a range of challenges. An attempt is made here to collate all the challenges because for the ultimate success of the Information. Literacy programs it is significant to know and understand the possible challenges.

- Political hurdles
- Inadequacy of technological infrastructure and IT skills:
- Traditional system of education
- Lack of collaboration between libraries and teaching faculty
- Low literacy rate
- Low demand for library services
- Lack of financial and human resources
- Inadequacy of time devoted
- Low level of publishing
- Students attitude (Rajaram,2006)

3. Need and Objectives of the study

The prime goal of the study is to understand the use of IT application for Information Literacy in college libraries of Yavatmal District affiliated to Sant Gadgebaba Amravati University, Amravati . In order to understand this study is aimed at the following:

- To study the use of Information Technology in Information Literacy.
- To identify the impact of IT towards Literacy.
- Problems in using Information Technology for Information Literacy; and
- Barriers in using Information Technology for Information Literacy.

4. Method of the study

The author adopted the survey method. 95 questionnaires were circulated among the colleges librarians of Yavatmal district affiliated to Sant Gadgebaba Amravati University, Amravati, out of which 60 (63.16%) responded.

5. Findings

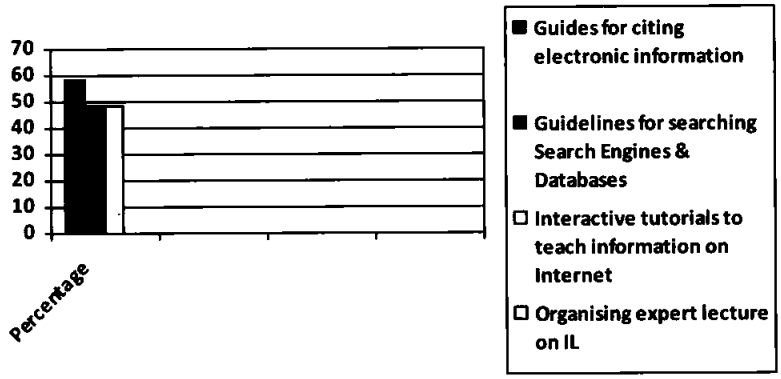


Figure 1 - IL programme followed in the libraries with the help of IT

It was shown from the above diagram that 58.33 % libraries using guides for citing electronic information, while 48.33 % libraries used guidelines for searching effectively different search engines and databases and interactive tutorials to teach the users how to evaluate the quality of information on Internet while using Information Technology for Information Literacy. No library organizes expert lecture on Information Literacy.

IL Programme developed by: Who developed the IL Programme is shown in the following Diagram No. 2



Figure - 2

It was shown from the above diagram that 58.33 % libraries developed the IL programme with the help of IT and it was developed in-house by team of library professionals as a part of a range of duties. No library mixed the team of library professionals, IT staff and administrative people for IL and External provider briefed by the IL programme development team.

- **Resources required for IL training programme:** What type of resources is required for IL training programme shown in Diagram No.3

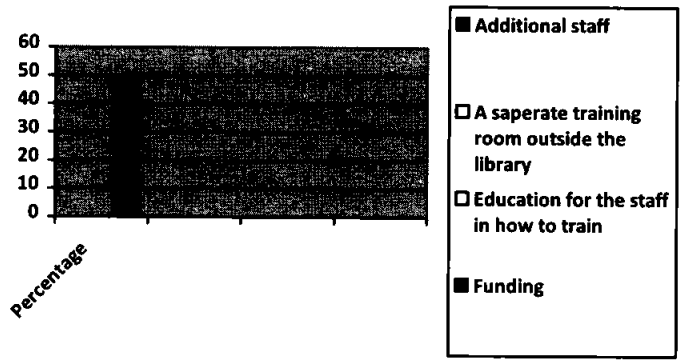


Figure -3

According to the researcher, following resources are required for conducting IL programme:

- Additional staff to plan and conduct training.
- A separate training audio visual hall outside library.
- Funding for the facilities to be provided to the trainees.
- Printed training material.
- Printed training manual.
- Modern electronic gadgets

From the available data collected by researcher, 48.33 % institutions have only the facility of printed training manual and modern electronic gadgets first four facilities are not available in any of the institutes from which the data were collected.

- **Techniques used in developing IL programme.**

What type of techniques used in developing IL programme are shown in Diagram No 4

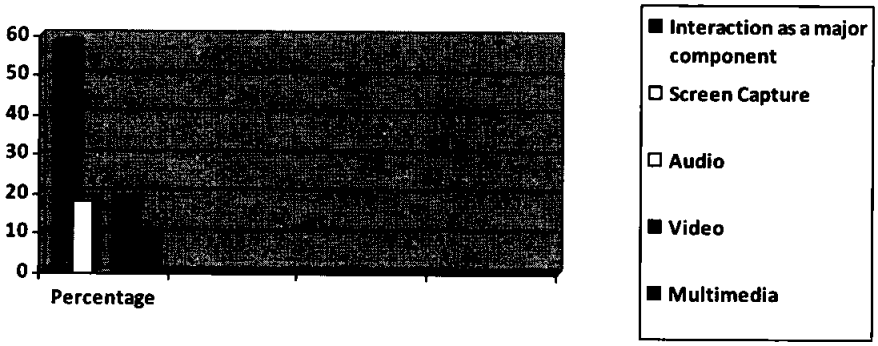


Figure 4

According to the researcher the techniques used for developing Information Literacy Programme with the help of Information Technology, 58.33 libraries used the interaction as a major component, 18.33 % libraries used screen capture and video technique and 10.00 % libraries used multimedia technique. No library used audio technique.

- **Modes used in IL programme:** The modes used in Information Literacy programme shown in Diagram No.5

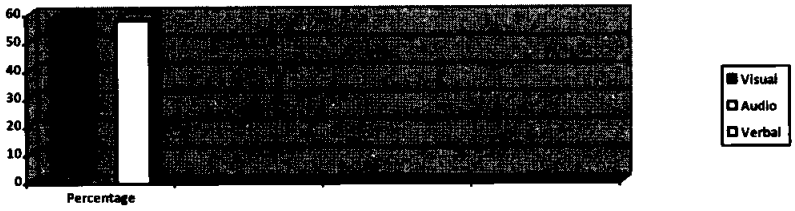


Figure 5

From the above data shown in the diagram the researcher found that 58.33 % libraries used the Visual and Verbal mode for use of IT for Information Literacy. No library uses the only Audio mode for use of IT for IL.

- **Information Literacy including Computer Literacy focused on skill in your Library**

The Information Literacy including Computer Literacy focused on skill in the Library are shown in Diagram No.6

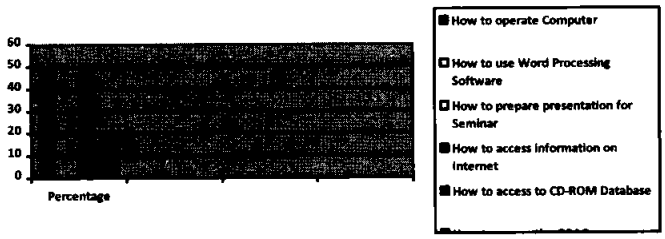


Figure 6

According to the researcher following skills were included for Information Literacy with the help of Computer Literacy.

1. How to operate Computer?
2. How to use Word Processing Software?
3. How to prepare presentation for seminar?
4. How to access information on Internet?
5. Access to CD-ROM Database?
6. Access to OPAC

From the available data 48.33 % libraries focused on the skill how to operate computer? And how to access information on Internet. 11.67 % libraries focused on the skill access to CD-ROM database and 18.33 % libraries focused on Access to OPAC.

- **Use of Internet in designing IL Programme:** The Use of Internet in designing IL Programme shown in the following Diagram No. 7

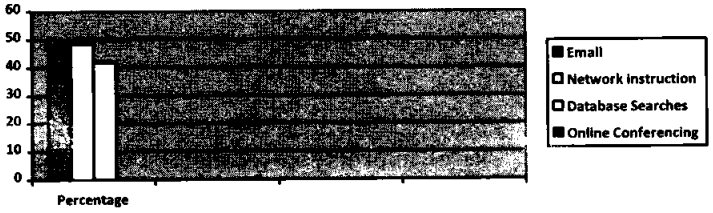


Figure 7

From the above diagram the researcher found that 48.33 % libraries used the Internet and Network instruction in designing IL programme. 41.67 % libraries used the Internet for database searches in designing IL programme. No library used internet for Online Conferencing.

- **Problems for effective delivery of IL:** The main problems for effective delivery of IL are listed below in the Diagram No 8

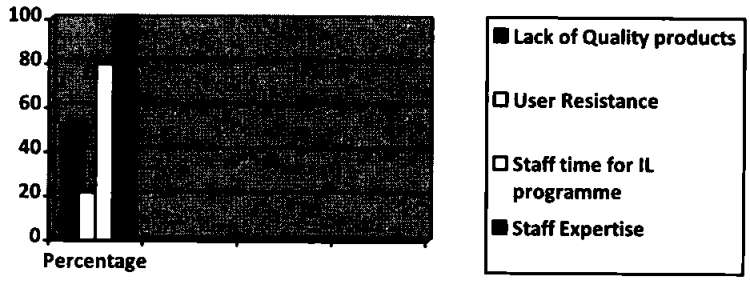


Figure 8

From the above diagram the researcher saw that all the respondents opinioned that "staff expertise" is the main problem in delivery of IL followed by staff time as opinioned by 80.00 % respondents, Lack of quality products was 51.67 % and 21.67 % User resistance. From above, it can be concluded that unskilled staff is the main hurdle in using IT for IL.

- **Barriers in using IT for IL:** Barriers and difficulties The possible factors that act as barriers in using IT for IL are shown in diagram No. 9 along with the respondents (out of 60) favoring those factors as barriers:

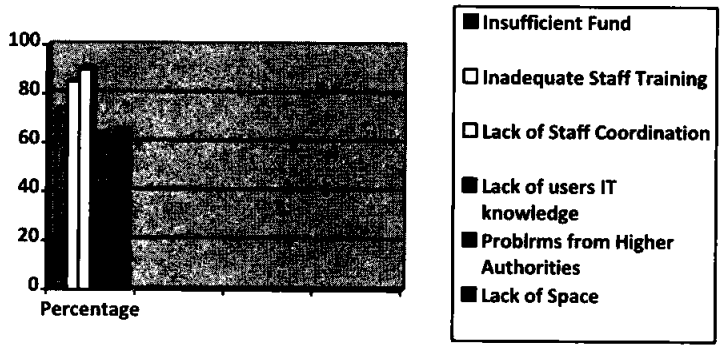


Figure 9

From the data, it was clear that lack of staff coordination is the main barrier according to 90.% respondents followed by inadequate staff training according to 85.00 % respondents. Insufficient funds also an important barrier according to 73.33 % respondents. Lack of users IT knowledge 63.33, problems from higher authority's 61.67 % and lack of space 65.00% was also affect the use of IT for IL. From above discussion it can be inferred that main barrier is staff's attitude and their lack of knowledge about IT.

7. Conclusion and Suggestions

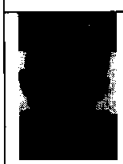
Present research work is to study the use of information technology for information literacy by college Librarians. Here it is expected that the college Librarians should inculcate information literacy using information technology among the students as well as other users of library for the efficient utilization of library services. It is proposed that information literacy program will be consisting of (a) guides for citing

electronic information, (b) provide guidelines for searching effectively different search engines and databases,(c) will provide interactive tutorials to teach the users how to evaluate the quality of information on the internet and (d) augment the information literacy by organizing expert lectures on information literacy. After studying this aspect of librarians, researcher had concluded the following points:

- Parent institutions should provide sufficient funds as per the norms given by Dr. S.R. Ranganathan (1965) or by Kothari commission (Gupta, 1992).
- Staff of the library should be sent to training courses to upgrade their IT Skills.
- IL is gaining momentum. It is found essential to make IL programme a regular activity in the higher learning institutions. Library professionals are slowly and steadily acquainting with the technological gadgets and showing interest in guiding the users in the information search and accessing the information through many means. It is advisable to collaborate with other units and sections such as computer and administrative divisions including teaching.
- The need of the hour is effective utilization of information technologies in planning, designing and delivering IL programmes. Instructions should be provided in locating, accessing, evaluating and effectively using electronic information available on the Internet. Accordingly interactive tutorials and expert lectures be organized. Library professionals can emerge as the leaders in motivating the users in the academic and environment to become lifelong learners. This clearly demands that the professionals should master the critical demands and skills in imparting IL. The programmes can be successful ventures if they incorporate screen captures, audio, video and multimedia techniques and learning styles so as to make them more interesting and easy to learn and understand. Network technologies should be used to a maximum extent for effective delivery of IL programmes.
- To conclude, the mission of IL is never ending. To cope-up with the growth of knowledge, users and information packages, there is always a need to master the technologies. Therefore, discussions, surveys and further intensive researches become inevitable to promote IL movement in any country. This is more required in a country like India to keep alive the democratic system by empowering the citizens with information. In this process the libraries and information centers become the active partners in the progress.

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Human Resources Development for Job Satisfaction

Shilpi Verma **Mega Arora**



This paper presents the key components of the human resource development. It also highlights the key challenges faced, the lessons learnt and the way forward in enhancing sustainable human resource development. Human Resource Development is needed by any organization that wants to be dynamic and growth-oriented or to succeed in a fast-changing environment. Organizations can become dynamic and grow only through the efforts and competencies of their human resources. Personnel policies can keep the morale and motivation of employees high, but these efforts are not enough to make the organization dynamic and take it in new directions. Job satisfaction as a key factor influencing effectiveness, efficiency and also productivity. Managers and researchers are interested in job satisfaction studies because of its relevance to organizational outcomes.



Human Resource Development, Job Satisfaction, Librarian's Role

1. Introduction

"Human Resource" is regarded as the most important resource for the advancement of the nation. If it is not properly developed, it cannot be put to proper use. Human force is the basic raw material for the development of an advanced nation. According to Peter Drucker "The most valuable asset of a 21st century institution will be its knowledge workers and their productivity. In an organization, staff development and staff training are parts of the bigger concept of human resource development (HRD). **HRD encompasses the broad set of activities that improve the performance of the individual and teams of an organization.** HRD is considered as the most vital link of the library. HRD involves both management and operative functions. Operative functions include procurement, development, compensation, integration and maintenance of personnel. It is the most powerful tool for any organization's success and the training of employees is regarded as one of the most important functions of effective resource management. In order to obtain a competitive edge in providing the best services to the customer, training which will develop a well-trained workforce is vital to render efficient and effective services in modern library and Information centers. Further, libraries require appointing staff, which possess IT skills so that they are in a position to perform a wide range of functions. This particular paper has been brought out to get a view of human factor, which is one of the most complicated aspects of any system. Yet, it's the one that gets the least attention, is least discussed, the least researched, and perhaps the least understood.

2. Need for Human Resource Development

Human Resource Development is needed to develop competencies: No organization can survive, let alone make a mark, if its employees are not competent in terms of knowledge, skills and attitudes. Competent employees are as much the necessity of non-profit organization as of a profit- making organization. Both types of organizations need competent employers for the success of their internal and external operations. A profit organization interested in growing, diversifying or improving its working such as cost reduction, reduction in delays, increased customer satisfaction, improved quality, image etc.

Human Resource Development is needed to bring about system – wide changes: Whereas traditional human resource development methods (such as training, job – rotation etc.) have their relevance and usefulness. They are themselves inadequate to bring about the kind of system – wide change which is visualized in the concept of Human Resource Development. In traditional methods often top management personnel have the attitude that all is well with them and it is only the lower level which needs to be trained and developed. Such attitude makes these programming ineffective because by keeping the interdependent and interacting higher levels out, these levels continue to remain plagued by forces of mistrust, jealously and

authoritarianism. HRD programmers bring about a system – wide change. They gradually enrich the entire socio technical system.

3. Functions of Human Resource Development are

- **Training and development:** Training and development is aimed at improving or changing the knowledge skills and attitudes of the employees. While training involves providing the knowledge and skills required for doing a particular job to the employees, developmental activities focus on preparing the employees for future job responsibilities by increasing the capabilities of an employee which also helps him perform his present job in a better way. These activities start when an employee joins an organization in the form of orientation and skills training. After the employee becomes proficient, the HR activities focus on the development of the employee through methods like coaching and counseling. This suggests the importance / significance of human resource development. It aims at educating and training employees for the improvement of overall performance of an organization. HRD programmes are for education, training and development of existing manpower in an organization. This is for facing new problems and challenges likely to develop in the near future. OR
- **Training** – improving the knowledge, skills improving the knowledge, skills and attitudes of employees for the short and attitudes of employees for the short- -term, term, particular to a specific job or task.
    - Employee orientation
    - Skills & technical training
    - Coaching
    - Development – Preparing for future responsibilities, while increasing the capacity to perform at a current job.
    - Management training.
    - Supervisor development
- **Organization Developments:** Organization Development is the process of increasing the effectiveness of an organization along with the well-being of its members with the help of planned interventions that use the concepts of behavioral science. Both micro and macro changes are implemented to achieve organization development. While the macro changes are intended to improve the overall effectiveness of the organization, the micro changes are aimed at individuals of small groups. Employee involvement programmes requiring fundamental changes in work expectation, reporting, procedures and reward systems are aimed at improving the effectiveness of the organization. The human resource development professional involved in the organization development intervention acts as an agent of change. He often consults and advising the line manager in strategies that can be adopted to implement the required changes and sometimes becomes directly involve in implementing these strategies.
- **Career Development:** It is a continuous process in which an individual progress through different stages of career each having a relatively unique set of issues and tasks. Career development comprises of two distinct processes. Career Planning and career management. Whereas career planning involves activities to be performed by the employee, often with the help of counselor and others, to assess his capabilities and skills in order to frame realistic career plan. Career management involves the necessary steps that need to be taken to achieve that plan. Career management generally focus more on the steps that an organization that can take to foster the career development of the employees. OR Ongoing process by which individuals progress through series of changes until they achieve their personal level of maximum achievement.
    - Career planning
    - Career management

- **Compensation payment and reward to manpower employed:** One function of Human Resource Development is to pay compensation (in monetary form) to employees for the services rendered. For this, a fair system of remuneration payment (wages and salaries) needs to be introduced. Remuneration to employees should be attractive so that the labour force will be satisfied and disputes, etc., will be minimized. Fair wage payment acts as a motivating factor. Along with compensation payment, Human Resource Development also deals with reward system. It is a type of appreciation of exceptional good work and offers some monetary or non-monetary incentive to suitable employees.
- **Provision of welfare facilities:** Employees are offered various welfare facilities. They include medical, educational, recreation, housing, transport and so on. These facilities are given for raising their efficiency and also for making their life happy. Welfare facilities create efficient and satisfied labour force. To introduce new labour welfare facilities and to maintain the existing facilities is one of the functions of HRD.

These Human Resource Development functions need to be performed regularly for the benefit of employees and also for continuity in the production activities of the organization.

4. Librarian's Role in HRD

- A "front line participant" in Human Resource Development.
- Implements Human Resource Development programs and procedures.
- On the- job training (OJT).
- Motivational lecture.
- Career and employee development.
- Integrates HRD with organizational goals and strategies.
- Promotes HRD as a profit enhancer.
- Tailors HRD to corporate needs and budget.
- Institutionalizes performance enhancement.

5. Job Satisfaction

Job satisfaction is a major factor in decisions regarding people's careers; however it is naïve to assume that people work primarily to achieve professional fulfillment and job satisfaction (Caruso, 2011). In fact, they seem to work because what they get on the job enables them to achieve whatever they want to achieve off the job. On the job, they must produce, which sometimes equals no enjoyment.

Every person has different reasons for working. The reasons for working are as individual as the person. But, we all work because we obtain something that we need from work. The something obtained from work impacts morale, employee motivation, and the quality of life. To create positive employee motivation, treat employees as if they matter - because employees matter (Judge and Saari, 2008). Or in other Words Job satisfaction is an attitude toward the job and the work context that has been in the centre of attention of theoreticians, researchers and practitioners for many decades. Past researches confirm that job satisfaction is related to employee's job performance, organizational commitment, organizational citizenship behaviour, life satisfaction, and health. These job- related outcomes are also the main goals of Human Resource function. Cluster analysis of participant responses on the HRM practices questionnaire shows four different groups of organizational approaches to Human Resource development that are moderately related to job satisfaction.

The term job satisfaction figures prominently in any discussions on management of human resources. Job satisfaction refers to a person's feeling of satisfaction on the job, which acts as a motivation to work. It is not the self- satisfaction, happiness or self- contentment but the satisfaction on the job. Job satisfaction is an individual's felling regarding his or her work. It can be influenced by a multitude of factors. The term relates to the total relationship between an individual and the employer for which he is paid.

Satisfaction does mean the simple feeling state accompanying the attainment of any goal; the end state is feeling accompanying the attainment by an impulse of its objective. The term Job satisfaction was brought to limelight by Hoppock (1935). Hoppock describes *job satisfaction as,* "any combination of psychological, and environmental circumstances that cause and person truthfully to say I am satisfied with my job." Job satisfaction measures "satisfaction across nine dimensions: pay, promotion, supervision, fringe benefits, contingent rewards, operating conditions, coworkers, nature of work, and communication"

About ten different approaches to the literature have been identified. Basically, they are separated by different characteristics of libraries or librarians. The ten characteristics are: Motivation; Academic Libraries/Faculty Status; Women; Public Libraries; Automation; International Libraries/Librarians; Life Satisfaction; Minorities; Management/Supervisors/Administration; Library Staff/Support (non-MLS); and Salary/Other.

Job Satisfaction Factors (Herzberg, 1976)

Hygiene factors	Motivators
Organisation policies	Achievement
Supervision	Recognition
Interpersonal relations	Work itself
Work conditions	Responsibility
Salary	Advancement Status
Growth	Job security

Job satisfaction articles dealing with primarily motivation generally overlap with the issues of concern by administrators and other areas, providing some overlap within the characteristics mentioned above. In the age of digital transaction, the job of LIS Professionals has become more important because they navigate, organize, preserve and disseminate human knowledge. Job satisfaction represents one of the most complex areas facing today's managers when it comes to managing their employees. There is a considerable impact of the employee's perceptions for the nature of his work and the level of overall job satisfaction. Financial compensation has a great impact on the overall job satisfaction of employees.

6. Conclusion

Job is an important aspect of an individual's life, occupies a lot of personal time compared to any other single activity and provides the financial basis for a persons' lifestyle. It is believed that satisfaction at work influences many aspects of work such as efficiency, productivity, absenteeism, turnovers rates, and intention to quit. Kinnell (1993) defines Job Satisfaction as a "pleasurable emotional state resulting from the appraisal of one's job". It has been correlated with positive behaviours toward others and physical health. It is related to personnel turnover and life satisfaction of employee in the organization. Job satisfaction is a complex and important concept for human resource managers to understand most employees do not believe their work is being properly rewarded. Nor do they believe that their organizations are doing enough to attract high quality performers, train them, or manage them effectively.

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Impact of ICT on job satisfaction of technical staff of the University Libraries of West Bengal, India

Arup Kumar Mondal



The paper studies the impact of ICT on job satisfaction of the technical staff of seven state funded general university libraries of West Bengal. Respondents were asked to tick against 25 job satisfaction related statements listed in the questionnaire. Five point Likert scale is used with weightage and mean values are determined for comparison of different parameters of job satisfaction and techno-stress as well. Difference of impact on the basis of gender, age, qualification, experience, and length of time spent on computer are studied. It is found that ICT work environment provide professionals higher level of job satisfaction. However the respondents consider that ICT does not offer better opportunities for professional growth, improvement of social prestige, status or personality. Regarding techno stress, over 50% respondents often suffer from eye problem, back & chest problem, and fatigue. 48.39% respondents feel board to work with computer. 18.33% respondents often experience headache whenever they work with computer. Provision of extensive in-service training and post training incentives, avenues of promotion, comfortable ergonomic design of ICT workstations, improved working conditions, arrangement of periodic health checkup and stress releasing measures are suggested.



ICT, Job satisfaction, Library automation, University library, LIS Professionals, Techno-stress, University Library, West Bengal.

1. Introduction

It is often said that the University Libraries in West Bengal are lagging in computer application. Lack of proper ICT training, work culture and managerial problems are often said to be the cause. An attempt is taken to know the staff reaction regarding ICT application in these libraries. Millins[1] noted that, "when a change occurs in the way employees handle information materials, services and their users, there is bound to be some change in their perception of their work and hence a shift in the orientation of their job satisfaction."

2. Literature Study

Palmini explores the effects that computerisation of libraries has had on the work and job satisfaction of support staff employed in academic libraries in Wisconsin. Mondal and Bandyopadhyay[3] examined the situation of IT application and related manpower problems in college libraries of Burdwan and found that the computerisation work of the college libraries is very slow and trained manpower is one of the major problems. Haridasan and Sultan[4] examined the extent of Occupational Stress felt by the library staff of the Gorakhpur University. Sornam and Sudha[5] studied the level of Occupational Role Stress (ORS) among women library professionals working in Bharathidasan University in Tamil Nadu. Lim[6] examined the job satisfaction of library information technology (IT) workers in relation to demographic and socioeconomic variables, and work-related variables. Ramzan and Singh[7] investigated the factors affecting librarian's attitudes toward IT application in libraries. Madhusudhan[8] investigated the level of job satisfaction among librarians of select engineering colleges in India and revealed that ICT is the highest motivating factor in increasing efficiency. Adeyinka[9] examined the attitudinal correlates of some selected Nigerian librarians towards the use and application of ICT. He found that four variables namely, age, gender, educational qualifications and knowledge of ICT significantly correlate with librarian's attitude towards ICT. Muhammad Ramzan[10] investigated the attitudes of librarians towards application of IT in academic libraries in Pakistan on a 5-point Likert scale through 42 IT attitude statements. Respondents showed overall positive attitudes toward IT with a mean of 3.71. Eguavoen[11] has examined the attitudes of library staff to the use of ICT in Kenneth Dike Library. The results revealed that the training and knowledge of ICT influence the attitudes of library staff toward its usage.

3. Objectives

The Objective of the study is to know the impact of ICT on job satisfaction; age wise, gender wise and qualification wise differences on the impact of ICT on job satisfaction; if the impact of ICT on job satisfaction differs with time spent on computer and also to know about techno-stress if any.

4. Scope

In West Bengal there are 12 state funded UGC recognized general universities. The scope of the study is kept limited to those seven of them, which are established before 2000 AD, whereas, most of the universities established after 2000 AD have not yet managed to develop big libraries and are not having considerable staff. There problems of retro-conversion and change in environment are also less. Library professionals having at least BLIS degree and involved in ICT related works are only covered under the study.

5. Methodology

Questionnaires were sent to 93 professionals of the 7 libraries who are known to be actively involved in using ICT and belonged to the professional working cadre, namely, library assistants, technical assistants (designated as assistant librarian Grade I and Grade II) and library supervisors. Filled-in questionnaires were received back from 63 (68%) respondents. To assess the impact of ICT on job satisfaction respondents were asked to tick mark against 25 positive statements listed in the questionnaire. Each statement consisted of Likert type scale 'strongly agree', 'agree', 'undecided / no comment', 'disagree', 'strongly disagree'. Each response is given a numerical score [Strongly Agree (SA) = 2, Agree (A) =1, Undecided(U)/No Comment (NC) = 0, Disagree(D) = -1, Strongly Disagree(SD) = -2] indicating its favourableness or unfavourableness, and the scores are totalled to measure the respondent's attitude. In other words, the overall score represents the respondent's position on the continuum of favourable-unfavourableness towards an issue[12]. The mean value of score is calculated as shown below:

Items	SA (2)	A (1)	U (0)	D (-1)	SD (-2)	NC(0)	Frequency	Score	Mean
I enjoy my co-workers	15	43	0	5	0	0	63	68	1.08

It is seen in the above statement that, out of 63 respondents 15 strongly agree, 43 agree, 0 undecided/ no comment, 5 disagree, 0 strongly disagree. Now multiplying each column's frequency with respective score and summing them we get: (15 x 2) + (43 x 1) +(0 x 0) + (5 x -1) + (0 x -2) = 30 + 43 + 0 – 5 + 0 + 0 = 68. Now mean value is calculated dividing total score by frequency, i.e., 68 / 63 = 1.07937 or 1.08 (approx).

6. Data analysis

It is found from Table 1 that Jadavpur Universiy (JU) started the automation work first in 1992 and Kalyani University(KU) started late in 2008 only. Only three libraries, namely Burdwan University(BU), North Bengal University(NBU) and Vidaysagar University(VU) have included most of its books in the computerized data base, although Calcutta University(CU) and JU have much bigger computerised catalogue. Rabindra Bharati University (RBU) has lowest number of books taken in its computerised catalogue.

Table No.1 Basic Data of the Libraries covered in the survey

Name of the Univ.	Year of estab.	Year of Library estab.	Year of starting Library Automation	Total Library Staff	Total No. Books available	Total No. of Books taken in Comp. Data base
CU	1857	1872	2002	108	15 L	5L*
JU	1955	1955	1992	67	6 L	3.5L
BU	1960	1960	2001	24	1.6L	1.3L
KU	1960	1960	2008	21	1.5L	36T!
RBU	1962	1962	2004	4	1L	5.5T
NBU	1962	1962	1999	14	2.5L	2.3L
VU	1981	1986	2001	9	92T	92T

*L=Lakh ! T=Thousand

Designation: It is seen from Table 2 that out of 63 respondent's 7 (11.11%) hold the post of 'Superintendent in library services', 33 (52.38%) are 'assistant librarian grade II', 14 (22.22%) are 'assistant librarian grade I' and 9 (14.29%) are 'Library assistant'. Thus, majority of the respondents belong to the post of Assistant librarian grade II. It may be noted here that Technical assistants in the University libraries of West Bengal are designated as assistant librarian grade I and grade II.

Table No.2 Designation wise Distribution of Respondents

Designation	No. of Respondent	%
Superintendent (library services)	07	11.11
Assistant librarian grade I	14	22.22
Assistant librarian grade II	33	52.38
Library Assistant	09	14.29
Total	63	100

Age distribution: From Table 3 we find that majority respondents (nearly 70%) belong to the most active age group of 25 to 45, however over 20% respondents belong to the age group 46-55.

Table No.3 Age distribution of the Respondents

Age Range (years)	No. of Respondent	%
18-24	03	4.8
25-35	16	25.4
36-45	28	44.4
46-55	13	20.6
56-65	03	4.8
Total	63	100

Educational Background: It is found from Table 4 that over 82% of the respondents have P.G. or higher professional degree. Only four (6.34%) respondents have diploma in computer science and three (4.76%) have P.G diploma in computer science.

Table No.4 Educational Background of Respondents

Course Name	General Education		Computer Science		Library Science	
	No of Resp.	%	No of Resp.	%	No of Resp.	%
Diploma	-	0.00	04	6.34	-	0.00
Degree	30	47.61	-	0.00	11	17.46
P.G. Diploma	-	0.00	03	4.76	-	0.00
P.G. Degree	32	50.80	-	0.00	41	65.08
M.Phil.	01	1.58	-	0.00	05	7.94
Ph.D.	-	0.00	-	0.00	06	9.52

Professional Experience: From Table 5 it is seen that 20.64% of the respondents have up to 5 years professional experience, while 44.44% have 6-10 years of experience, and rest 35% of the respondents have over 10 years of experience.

Table No.5 Professional Experience

Experience Range (years)	No. of Respondent	%
≤ 5	13	20.64
6-10	28	44.44
11-15	7	11.11
16-20	5	7.94
21-25	3	4.76
25 +	7	11.11
Total	63	100

Work Areas of Respondents: Out of the 63 respondents, 27 (42.86%) are working in Technical processing section. followed by 12 (19.05%) in Merge section and 6 (9.53%) each in Acquisition, Serials control & circulation section.

TableNo.6 Work Areas of Respondents

Work Area	No. of Respondent	%
Acquisition	6	9.53
Technical Processing	27	42.86
Serial Control	6	9.52
Circulation	6	9.52
Reference	4	6.35
Merge section*	12	19.05
Stack Room	2	3.17
Total	63	100

*Work in different sections as required

Time Spent on Computer at Work Place: From table 7 we come to know that only 31.75% spend 4-6 hours per day of their time on computer at workplace. Although over 60% of the respondents spend over 2 hours per day on computer, 40% spend less than 2 hours a day on computer. Thus, these library professionals spend less than half of their time on computerised operations and are yet to make extensive use of available technological facilities.

Table No.7 Time Spent on Computer at Work Place by Respondents

Time range (in hours)	No. of Respondent	%
4-6 hrs	20	31.75
2-4 hrs	18	28.57
1-2 hrs	18	28.57
Not at all	07	11.11
Total	63	100

Impact of ICT on job satisfaction: Table 8 depicts ranked order of impact of ICT on job satisfaction on the basis of mean value of response. To assess the impact of ICT on job satisfaction respondents were asked to tick mark against 25 positive statements listed in the questionnaire. The mean value has been calculated on the basis of Likert scale. As discussed under methodology. The table shows that, the average scores on the 25 aspects were high ranging from 1.35 to 0.56. The highly recognized ICT effects are: 'ICT helped to keep me up-to-date', 'enabled enormous saving in time and efforts', 'created a better quality of working environment',

'made it mandatory to learn to use modern technologies', and 'Upgraded my knowledge & skill'. All the impacts of ICT are listed in the table in descending order of their rank. Overall, it is observed that ICT work environment provide professionals higher level job satisfaction. However, in some areas ICT provide professionals least positive impact. These are: it does not offer new challenges and better opportunities for professional growth, dedication to the task, responsibility, physical work/activity/movement, improvement of social prestige, status, personality etc.

Table No.8 Impact of ICT on job satisfaction

Rank	ICT Items	SA (2)	A (1)	NC (0)	U (0)	D (-1)	SD (-2)	Score	Mean
1	Helped to keep me up-to-date.	27	33	1	0	2	0	85	1.35
2	Enabled enormous saving in time and efforts.	22	37	1	1	2	0	79	1.25
3	Created a better quality of working environment.	20	39	1	2	1	0	78	1.24
4	Made it mandatory to learn to use modern technologies.	24	32	2	1	4	0	76	1.21
5	Upgraded my knowledge & skill.	24	31	0	3	5	0	74	1.17
6	Made my work more interesting	16	43	1	1	1	1	72	1.14
6	Provided more variety in my work.	17	41	1	1	3	0	72	1.14
8	Increased my job satisfaction	20	34	6	1	1	1	71	1.13
8	Information search and evaluation has become easy.	24	30	3	1	3	2	71	1.13
10	Improved accuracy, consistency and reduced errors.	22	33	2	0	5	1	70	1.11
11	Enabled to devote more of my time for user service.	20	34	4	0	5	0	69	1.10
12	Increased my efficiency & performance.	13	44	2	2	1	1	67	1.06
13	Improved my competence and performance.	17	38	4	0	2	2	66	1.05
14	Enabled rapid communication.	19	35	3	0	4	2	65	1.03
15	Improved my morale and motivation.	13	39	3	4	3	1	60	0.95
16	Offered new challenges and better opportunities for professional growth.	23	27	2	1	6	4	59	0.94
17	Increased more dedication to the task.	12	39	2	2	6	2	53	0.84
18	Added more responsibilities to my work.	10	39	2	5	7	0	52	0.82
19	Reduced physical work / activity / movement.	11	38	3	3	7	1	51	0.81
20	Reduced my workload by eliminating duplication of efforts.	13	34	4	3	6	3	48	0.76
21	Improved my personality.	13	31	5	1	10	3	41	0.65
22	Brought major changes in my work.	11	28	6	5	13	0	37	0.59
23	Improved my status.	14	29	3	1	11	5	36	0.57
23	Provided greater autonomy to my work.	10	31	3	6	11	2	36	0.57
25	Improved my social prestige.	14	26	5	3	11	4	35	0.56

SA= Strongly Agree (2); A= Agree (1); NC=No Comment (0); U= Undecided (0); D= Disagree (-1); SD= Strongly Disagree (-2).

Gender wise impact of ICT on job satisfaction: Table 9 shows gender wise impact of ICT on job satisfaction. It is found that Female staff considers to a higher (Mean 1.24) degree that ICT environment reduced workload by eliminating duplication of efforts than their male partners (Mean 0.59). No significant difference is found between male and female library professionals in their total mean value. Therefore, it can be commented that both male & female library professionals have got similar satisfaction to work in ICT environment.

Table No.9 Gender wise impact of ICT on job satisfaction

Items	Gender	
	Mean value of job satisfaction	
	Male	Female
Upgraded my knowledge & skill.	1.24	1.00
Made my work more interesting	1.17	1.06
Made it mandatory to learn to use modern technologies.	1.17	1.29
Increased my job satisfaction	1.09	1.24
Created a better quality of working environment.	1.26	1.18
Provided more variety in my work.	1.17	1.06
Added more responsibilities to my work.	0.80	0.88
Improved my competence and performance.	1.04	1.06
Offered new challenges and better opportunities for professional growth.	0.89	1.06
Improved my morale and motivation.	0.70	1.06
Enabled to devote more of my time for user service.	1.11	1.06
Brought major changes in my work.	0.57	0.65
Improved my status.	0.59	0.53
Reduced my workload by eliminating duplication of efforts.	0.59	1.24
Enabled rapid communication.	0.96	1.24
Improved accuracy, consistency and reduced errors.	1.11	1.12
Enabled enormous saving in time and efforts.	1.28	1.18
Reduced physical work / activity / movement.	0.78	0.88
Information search and evaluation has become easy.	1.11	1.18
Improved my social prestige.	0.63	0.53
Improved my personality.	0.67	0.59
Increased more dedication to the task.	0.85	0.82
Increased my efficiency & performance.	1.09	1.00
Helped to keep me up-to-date.	1.43	0.53
Provided greater autonomy to my work.	0.63	0.41
Total mean value	**23.93**	**23.85**

Age wise impact of ICT on job satisfaction: Table 10 and Figure 1 show age wise impact of ICT on job satisfaction. Library professionals who belong to age group 56-65years are highly satisfied to work within ICT environment. Through interview it is identified that they (age group 56-65years) are not competent enough to work in ICT environment but they give more priority to work in ICT environment. Those belonging to age group 18-24 & 25-35 have acquired 2nd & 3rd position in this respect. They have obtained similar satisfaction to work in ICT environment. Library professionals who belong to age group 36-45 have obtained lower level

satisfaction compared to other age groups. Middle aged (25-35yrs.) professionals consider to a higher (mean1.31) degree that ICT offered new challenges and better opportunities for professional growth.

Table No.10 Age wise impact of ICT on job satisfaction

Items	Age				
	Mean value of job satisfaction				
	18-24	25-35	36-45	46-55	56-65
Upgraded my knowledge & skill.	1.33	1.44	1.11	0.77	2.00
Made my work more interesting	1.33	1.31	1.00	0.77	2.00
Made it mandatory to learn to use modern technologies.	1.33	1.44	0.93	1.38	1.67
Increased my job satisfaction	0.67	1.38	0.96	0.92	2.00
Created a better quality of working environment.	1.33	1.25	1.14	1.23	2.00
Provided more variety in my work.	1.00	1.19	1.00	1.23	2.00
Added more responsibilities to my work.	0.33	0.94	0.82	0.69	1.33
Improved my competence and performance.	1.33	1.31	0.89	0.54	1.67
Offered new challenges and better opportunities for professional growth.	0.33	1.31	0.75	0.62	0
Improved my morale and motivation.	1.00	1.13	0.86	0.62	1.67
Enabled to devote more of my time for user service.	0.33	1.25	1.07	1.00	1.67
Brought major changes in my work.	0.33	0.31	0.64	0.77	1.00
Improved my status.	1.33	0.75	0.36	0.62	1.33
Reduced my workload by eliminating duplication of efforts.	1.00	0.56	0.57	1.00	1.67
Enabled rapid communication.	1.33	1.19	0.75	0.77	1.67
Improved accuracy, consistency and reduced errors.	1.67	0.94	0.89	1.38	1.67
Enabled enormous saving in time and efforts.	1.33	1.19	1.11	1.54	1.67
Reduced physical work / activity / movement.	1.00	0.81	0.50	1.15	1.33
Information search and evaluation has become easy.	1.33	1.00	1.04	1.31	1.67
Improved my social prestige.	1.33	0.75	0.25	0.62	1.33
Improved my personality.	1.33	0.88	0.50	0.46	1.67
Increased more dedication to the task.	1.00	1.00	0.75	0.62	1.67
Increased my efficiency & performance.	1.00	1.13	1.00	1.08	1.67
Helped to keep me up-to-date.	1.67	1.38	1.21	1.31	2.00
Provided greater autonomy to my work.	1.00	0.44	0.46	0.38	1.33
Total mean value	**26.96**	**26.28**	**20.56**	**22.78**	**39.69**

Qualification wise impact of ICT on job satisfaction: It is seen from table 11 depicts that, library professionals with BLIS, MLIS & MPHIL/PHD qualifications have got similar level of satisfaction to work in ICT environment. No significant differences have been found between them in their total mean value. It was found that MPHIL/PHD holders consider to a higher (Mean1.27) degree that ICT offered new challenges and better opportunities for professional growth than BLIS (Mean 0.36) & MLIS (mean 1.00) degree holders. But BLIS (mean 1.09) degree holders are more satisfied than MLIS (mean 0.41) & MPHIL / PHD (Mean 0.64) holders because ICT have provided greater autonomy to their work.

Table No.11 Qualification wise impact of ICT on job satisfaction

Items	Professional qualification		
	Mean value of job satisfaction		
	BLIS	MLIS	M.Phil / Ph.D
Upgraded my knowledge & skill.	1.27	1.10	1.36
Made my work more interesting	1.27	0.98	1.64
Made it mandatory to learn to use modern technologies.	1.00	1.17	1.55
Increased my job satisfaction	1.36	1.07	1.18
Created a better quality of working environment.	1.36	1.17	1.36
Provided more variety in my work.	1.27	1.02	1.45
Added more responsibilities to my work.	1.09	0.76	0.82
Improved my competence and performance.	1.00	0.95	1.45
Offered new challenges and better opportunities for professional growth.	0.36	1.00	1.27
Improved my morale and motivation.	1.09	0.93	0.91
Enabled to devote more of my time for user service.	1.27	1.05	1.09
Brought major changes in my work.	0.64	0.66	0.27
Improved my status.	0.64	0.56	0.55
Reduced my workload by eliminating duplication of efforts.	0.73	0.85	0.45
Enabled rapid communication.	1.18	0.88	1.45
Improved accuracy, consistency and reduced errors.	1.18	1.12	1.00
Enabled enormous saving in time and efforts.	1.45	1.24	1.09
Reduced physical work / activity / movement.	0.73	0.85	0.73
Information search and evaluation has become easy.	1.27	1.07	1.18
Improved my social prestige.	1.18	0.46	0.45
Improved my personality.	0.91	0.63	0.45
Increased more dedication to the task.	1.18	0.76	0.82
Increased my efficiency & performance.	1.18	1.00	1.18
Helped to keep me up-to-date.	1.45	1.34	1.27
Provided greater autonomy to my work.	1.09	0.41	0.64
Total mean value	**27.15**	**23.03**	**25.61**

Techno-stress: Table 12 has summarized techno-stress among library professionals. Techno-stress in this study is regarded as negative attitudes, thoughts, behaviours and body physiology caused by the use of computer technology by the library personnel in carrying out their duties. It is seen from the table that a large number of 30 (48.39%) library professionals either feel bored sometimes or not at all. More than 50% library professionals do not belief that computerised work environment may create problems such as irritation,

frustration, pressurisation, isolation, afraid, dry mouth, heartbeat, loss of control and tension. 52.54% respondents sometimes suffer from back & chest problem followed by 49.12% respondents experienced fatigue and 48.39% respondents feel board to work with computer. 18.33% respondents often experienced headache whenever they work with computer. 58.73% respondents very often suffer from eye sight related problem to work with computer. It is also seen from the table that most of the respondents have experienced eye sight problem when they work with computer. It is clear from the analysis that techno-stress is a problem for a considerable percentage of the library professionals, although, others enjoy working with computer.

Table No.12 Techno-stress

Items	Not at all (0)	Some time (1)	Often (2)	Very often (3)	Weightage
Do you feel bored when you work with the computer?	30* (48.39)	30 (48.39)	1 (1.61)	1 (1.61)	35
Do you feel frustrated when you work with the computer?	50 (80.65)	6 (9.67)	2 (3.23)	4 (6.45)	22
Do you feel irritated when you work with the computer?	39 (65.00)	16 (26.67)	3 (5.00)	2 (3.33)	28
Do you feel pressurized by your employer, supervisor or co-worker to work with the computer?	47 (82.45)	9(15.79)	1 (1.76)	-	11
Do you feel isolated (alone) when you work with the computer?	49 (83.05)	8 (13.56)	2 (3.39)	-	12
Do you feel back and chest pain when you work with the computer?	17 (28.81)	31 (52.54)	10 (16.96)	1 (1.69)	54
Do you experience fatigue when you work with the computer?	18 (31.58)	28 (49.12)	9 (15.79)	2 (3.51)	52
Do you experience fear when you work with the computer?	46 (77.97)	7 (11.86)	5 (8.48)	1 (1.69)	20
How often do you experience headache when you work with the computer?	22 (36.67)	26 (43.33)	11 (18.33)	1 (1.67)	51
How often do you experience dry mouth when you work with the computer?	40 (70.17)	12 (21.05)	4 (7.02)	1 (1.76)	23
Do you experience increase in heart beat when you work with the computer?	45 (80.35)	8 (14.29)	2 (3.57)	1 (1.79)	15
Do you experience a feeling of loss of control when you work with the computer?	46 (75.41)	11 (18.03)	1 (1.63)	3 (4.93)	22
Do you experience tension when you work with the computer?	44 (75.86)	10 (17.24)	3 (5.17)	1 (1.73)	19
Do you experience eye sight problem when you work with the computer?	-	12 (19.05)	14 (22.22)	37 (58.73)	151

* % (percentage) value of the row is given in parenthesis.

7. Major Findings of the Study:

- Most of the respondents have over 4 years ICT (Information & Communication Technology) experience.
- Most of the respondent library professionals spend less than half of their duty hours on computerised operations.
- ICT work environment provide professionals higher level of job satisfaction because ICT helps them to keep up-to-date, save their time, provide better quality work life etc. However, it does not offer new challenges and better opportunities for professional growth, dedication to the task, responsibility, physical work/movement, improvement of social prestige, status, personality etc.

- Middle aged (25-35year) library professionals consider to a higher degree that ICT offered new challenges and better opportunities for professional growth than other age groups. Professional of age group 36-45 have lower level satisfaction compared to other age groups.
- MPHIL / PHD holders consider to a higher degree that ICT Offered new challenges and better opportunities for professional growth than BLIS and MLIS degree holders. But BLIS degree holders are more satisfied as ICT have provided greater autonomy to their work.
- Library professionals who do not use computer are comparatively less satisfied to work within this ICT environment. But they have agreed with the advantages of ICT work culture.
- Regarding techno stress, 52.54% respondents sometimes suffer from back & chest problem followed by 49.12% experiencing fatigue and 48.39% respondents feel board to work with computer. 18.33% respondents often experience headache whenever they work with computer. 58.73% respondents very often suffer from eye sight related problem to work with computer. It is clear from the analysis that techno stress is a considerable problem for some library professionals and the work environment need be improved. However, more than 50% library professionals do not believe that computerised work environment may create problems such as irritation, frustration, pressurisation, isolation, afraid, dry mouth, heartbeat, loss of control and tension.

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Information Literacy among College Teachers in Electronic Era: *A Case Study*

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Abstract

The present study aims to ascertain information literacy skills among college teachers of S.R. Government College for Women in electronic information age. Structured questionnaire was used to collect data. The study reveals that teachers use information for updating their knowledge. They use various strategies on internet to retrieve required information. Majority of the college teachers never participated in seminar or workshop on information literacy and the need of technology literacy programmes for them. Suggested to organise regular information literacy programmes to educate the teachers and be integrated in curriculum.

Information Literacy, Electronic environment, Strategies

1. Introduction

Contemporary society is called knowledge society where information and knowledge has become vital resources for overall societal development. Information now-a-days has become a valuable resource of high value and its production and consumption level is an index to the social, economic, technological and academic advancement of the society. Technology is always regarded as a driving force as well as the mirror of the society. The new information technology with its tools such as computer, internet is the current manifestation of the important role that information is playing in every sector of the society. In fact, today's information explosion is the product of technical knowledge and information technology is its carrier.

Information literacy is a survival skill in the new information age which is challenging the common man with abundance of information every day. As Colin Campbell (a former university librarian of Yale) points out "we are drowning in information and starving for knowledge". In this situation information literacy works as a life jacket to save the human brain from unwanted and unnecessary information flood. Instead of drowning, an information literate person knows how to find, evaluate and use information effectively to solve a particular problem or make a decision. American Library Association's (1989) final report states, "To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information"

2. Review of literature

Joshi and Nikose conducted a survey on faculty members of engineering college to know their internet information literacy. The study revealed that e-journals (92.8%) were most needed for e-information. 92.8% of the respondents need e-resources to keep their knowledge up to date.71.43% had knowledge of internet applications. Study recommended that faculty members should network with those who already using e-information to make use of their knowledge and skill.

Haneefa and Shukkor conducted study to ascertain the information and communication technology literacy among library professionals of Calicut university. Findings showed that young professional assistants were more ICT literate than junior librarians and assistant libraraians.82% of the library professionals mostly used Microsoft Windows operating system. Libsys software was mostly used and high among professional assistants(29%).The authors recommended provision of state of the art ICT infrastructure including hardware, software and e-resources with full-fledged internet access. Padme conducted survey to know the computer and information literacy of the participant teachers of orientation course. The study showed that majority of the respondents (26.33%) did not know how to operate computer.32.5% of them did not have the

capability to use the internet. Study suggested that UGC and university should impart information and computer literacy programmes among teachers and students engaged in higher education. Kaur, Sarman and Rani,S.'s study explored the status of information literacy skills of students of Guru Nanak Dev University. The findings of the study revealed that majority of the respondents possess knowledge of MS-office (80%), social networking sites (75.6%) and e-mail (71.2%).Among internet searching tools, search engines (81.2%) was most common. Majority of the respondents(75.6%) do not have the ability to identify citations. The study suggested that university library should have separate funding to start information literacy programmes to educate students.

3. Significance of the study

Teachers are called nation builders. It is necessary that they should posses information literacy skills not only for their own personal use but to guide their students in a right way. Teachers especially college and university can provide them foundation for continued growth throughout their careers as well as in their roles as informed citizens. Present study is undertaken to examine the information literacy skills among government college teachers in electronic environment.

4. Saroop Rani Government College for Women, Amritsar

S. R. Govt. College for Women, Amritsar is the only premier government institution which is providing quality and affordable education to girls. College is affiliated with Guru Nanak Dev University Amritsar. It is well-equipped with the facilities and quality staff and has grand campus with green cover in the posh area of the city. It was established in 1932 and shifted to the present building in 1963. With a focus on progress in academics, cultural activities & sports, college lay great emphasis on imparting value-based education and on women empowerment. It makes constant effort to equip students so as to enable them to meet the challenges of life. Realizing the need of hour and to keep pace with the altered scenario & provide better career prospects, college has made special arrangements for the students to provide on-the-job training with the aid of allied industries. The college takes pride to produce a host of eminent personalities of national & international repute. The college faculty comprises of various disciplines such as Botany, Physics, Chemistry, Sanskrit, Punjabi, Hindi, Economics, Commerce, Mathematics, Home Science, History, Fine Arts etc. Presently, the total number of faculty member(permanent, part-time and guest faculty)is 128.

5. Objectives of the study

The main objectives of the study are:

- To determine teachers' ability to specify electronic information sources for information.
- To examine the strategies used by the college teachers on internet to retrieve information.
- To assess the ability of the college teachers to use technology effectively to solve specific information problems to fulfill the students' information need.
- To determine the need of information literacy and formal technology literacy programmes in making them self-learners and life-long learners.

6. Research Methodology

For the present study, a structured questionnaire has been administered to the faculty members of S.R Government College for Women, Amritsar to collect information regarding information literacy competence in electronic information age. To obtain necessary data, a total of 100 questionnaires were randomly distributed to faculty members. Out of 100 questionnaires, 70 were completed and returned. The collected data have been analysed by MS-Excel and SPSS for descriptive statistics and presented in tabular form and graphic form.

7. Data Collection

Table 7.1- Data Collection

Total faculty members	Distributed	Number of responses
128	100	70

8. Analysis of Data and Interpretation

- **Gender-wise distribution of the respondents:** Table 1 given above shows that majority of the respondents (85.7%) are females.

Table 1: Gender-wise distribution of the respondents

Gender	No of responses	Percentage
Male	10	14.3
Female	60	85.7
Total	70	100

- **Faculty-wise distribution of the respondents:** Table 2 depicts subject-wise distribution of respondents. Majority of the respondents

(40%) are from Arts and Social sciences faculty.

Table 2: Faculty-wise distribution of the respondents

Faculty	No of responses	Percentage
Arts and Social Sciences	28	40
Humanities	20	28.6
Sciences	18	25.7
Commerce	4	5.7
Total	70	100

- **Purpose of searching information:** Table 3 show the purpose of searching information. Majority of the respondents (91.4%) require information for updating knowledge followed by for supporting research (42.9%) and 22.9% need for spending leisure time. It reveals that most of the college teachers search information to keep themselves up to date.

Table: 3 Purpose of searching information

Purpose	No of responses	Percentage
For lecture preparation	24	34.3
For updating knowledge	64	91.4
For research	30	42.9
For spending leisure time	16	22.9

- **Sources of information:** Table 4 exhibit information sources used by the faculty members to fulfil their purpose. Most of them (85.7%) use internet for information followed by e-resources (54.3%). 2.9% of the respondents mention discussions and meeting people as 'any other' sources. The data shows that internet is mostly consulted and textbooks/ subject books are the least consulted by the college teachers for information.

Table: 4 Sources of information

Sources	No of responses	Percentage
Textbooks/Subject books	24	34.3
Reference books	32	45.7
E-resources	38	54.3
Internet	60	85.7
Any other	2	2.9

- **Place to find information:** Table 3 depict place preferred by the respondents to search information.77.1% of the respondents prefer library for information followed by home (57.2%), cyber café (14.3%). 2.9% used office mentioned in 'any other'. It shows that the college teachers prefer library to get required information.

Table: 5 Place to find information

Place	No of responses	Percentage
Library	54	77.1
Home	40	57.2
Cyber Cafe	10	14.3
Computer lab	8	11.4
Any other	2	2.9

- **Ratio of using print and electronic information sources:** Table 4 shows the ratio of using print and electronic information sources. Majority of the respondents (57.1%) use 50:50 print and electronic sources followed by 40:60 ratio. It is observed that both print and electronic sources are used for getting information.

Table 6: Ratio of using print and electronic information sources

Ratio	No of responses	Percentage
50:50	40	57.1
40:60	12	17.1
30:70	10	14.3
20:80	4	5.7
10:90	4	5.7
Total	70	100

- **Strategies used on internet:** Table 7 and figure 4 reveal the strategies used by the teachers to search and retrieve information. 54.3% of the college teachers find information through search engines followed by websites (42.9%). 5.7% of the respondents find information on facebook, orkurt specify as any other strategies. The data clearly shows that majority of the respondents adopt various strategies to find information and among these search engines is mostly used. They use their information technology skills to find information.

Table 7: Strategies used on internet

Strategies	No of responses	Percentage
Search engines	38	54.3
Websites	30	42.9
E-mail alerts	14	20
Subject gateways	8	11.4
Any other	4	5.7

- **Success to find required information using internet:** Table 8 depicts success of finding required information using internet. Majority of the teachers (51.4%) consider success rate of finding information 75% followed by 50% (22.9%).Only 5.7% of the college teachers consider success rate 25%.The data reveals that teachers know as how to use internet and find required information.

Table 8: Success to find required information using internet

Success rate	No of responses	Percentage
25%	4	5.7
50%	16	22.9
75%	36	51.4
100%	14	20
Total	70	100

- **Reasons for using electronic information sources:** Table 9 reveal reasons for using electronic information sources. Most of the teachers (62.9%) use electronic information resources for easy access followed by saves time (57.1%). 20% of the respondents use for authenticity. It reveals that the main reason of using electronic information sources by college teachers is easy access.

Table 9 : Reasons for using electronic information sources

Reason	No of responses	Percentage
Saves time	40	57.1
Reliable	26	37.1
Authentic	14	20
Easy access	44	62.9

- **Participation in seminar on Information Literacy:** Table 8 above show the participation of college teachers in seminar/workshop on information literacy. Majority of the respondents (68.6%) have not participated in any seminar or workshop on information literacy.

Table 10 : Participation in seminar on information literacy

Option	No of responses	Percentage
Yes	22	31.4
No	48	68.6
Total	70	100

Formal training to use technology: Table 9 exhibit the need of formal technology training programmes for using information effectively. Majority of the respondents (94.3%) heavily favour the need of formal technology training for using information effectively.

Table 11: Formal training to use technology

Option	No of responses	Percentage
Yes	66	94.3
No	4	5.7
Total	70	100

9. Findings of the study

The major findings of the study are:

- A majority of the respondents need information for updating knowledge (91.4%), for supporting research (42.9%) and for lecture preparation (34.3%).

- A majority of the teachers use internet (85.7%) to find information.
- Library is preferred place for finding information.77.1% of the college teachers use library to consult information sources.
- A majority of the respondents (57.1%) use both print and electronic information sources to fulfill their purpose.
- Search engines (54.3%) are mostly used searching tools by the teachers for finding information.
- Most of the teachers (51.4%) get 75% success on internet to find required information.
- A majority of them (62.9%) use electronic information sources for easy access.
- Majority of the respondents (68.6%) have not participated in any seminar/workshop on information literacy.
- Findings show that information literacy subject is not part of the curriculum (80%).
- Majority of the teachers (94.3%) favour the need of formal technology training programmes to use information effectively.

10. Suggestions

On the basis of the findings of the study and in order to make the college teachers and student sustainable in the growing higher education system, the following suggestions are put forth:

- University should organise regular information literacy seminars or workshops to educate the college teachers.
- University should include information literacy in the curriculum.
- Information and communication technology literacy skills should also be integrated in curriculum to improve ICT skills.
- College should have enough infrastructures to promote e-information literacy among teachers and students.
- Librarian and other library staff must learn new technology skills and implement those in libraries to orient teachers and students regarding different search strategies and available databases of e-books and e-journals.

11. Conclusion

We are living in electronic information age and information and communication technologies are the basic tools used in higher education for more effective learning. In this age, it is perceived that information and communication technology literacy automatically equates to information literacy. Now, teachers, librarians have greater responsibility to give the effective, accurate, evaluated and reliable and skill full education to the students. Teachers and librarians both must be prepared to teach students to become critical thinkers, intellectually curious observers, creators, and efficient users of information in order to face the challenges of life.

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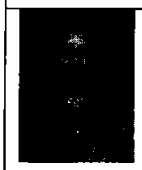
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Information Literacy Assessment of P.G Students at Vikrama Simhapuri University, Nellore- *A Study*

Sudharani, Y



This article presents the results of a study conducted at Vikrama Simhapuri University College, Nellore. The purpose of the study was to assess the P.G student's information literacy skills. To collect data from the respondents a structured questionnaire was used. The sample for the study was the P.G students from eight faculties. The data collection was completed in the first week of January 2014.The major findings of the study are most of the respondents (74.60%) prefer to search book shelves directly. The study also identified the student's lack of knowledge in using Boolean operators and majority of the students lacking legal and ethical use of information. Some suggestions have been set forth to incorporate information literacy among the university students.



Information literacy, university students, user survey

1. Introduction

Lupton says Information literacy is a way of learning through engaging with information. Information literacy includes "library research skills" and "IT literacy" but it is broader than these. Information Literacy is not just finding and presenting information, it is about higher order analysis, synthesis, critical thinking and problem solving .It involves seeking and using information for independent learning and life long learning, participative citizenship and social responsibility. Kapitzki advocates in a simple way "Information literacy is about 'learning with and through information' but it should also include 'learning about information and about knowledge."

Information literacy (IL) is basically an active process of searching and using found information effectively that influences a quality way of life of people in a modern society. The people who become information literate can apply meaningful information to aspects of their lives in personal needs, family matters, working practices, and social responsibilities. Library and information professionals and academics take more of an interest in the IL field over the three past decades to engage in any of activities in connection with the development of ILs kills in schools, colleges, or universities. It is accepted that students at every educational level have to be roughly prepared to: 1) make their accurate information decisions, 2) seek and locate the right information at the right time, 3) locate appropriate information sources, 4) employ information technology suitable for accessing information materials, and 5) evaluate, analyze, and synthesize content ethically.(Somsaksriborisutsakul et al 2012).

Skills in use of information resources, and evaluation of information among University students makes them future knowledge workers in the knowledge based society. There are several guidelines, formats, proposals available to impart information literacy in higher education. SCONUL, UNESCO, and ACRL are the prominent organizations focused in this area.

2. Scope of the study

The scope of the study confines to focus on information literacy skills of P.G students in identifying, locating, searching, accessing, retrieving and using information. The study includes PG students of the VS University College, Nellore viz. M.B.A, Biotechnology, Micro Biology, Statistics, Commerce, Chemistry and English.

3. Objectives of the study

The present study is tried to find out the information literacy skills among the post graduate students of V.S University College, Nellore. The study was carried out under the following objectives:

- To know the students frequency of visit to the university library
- To identify the most preferred documents in the library by the students
- To identify the competency level of information literacy among the P.G students at V.S. University
- To identify the areas in that the students lacking information literacy skills.
- To make recommendations on how the information literacy program could be designed.

4. Methodology

The population of the study was P.G students of the Vikrama Simhapuri University Library; Nellore. A questionnaire was designed to collect the data from the respondents. The questionnaire is closed ended and questions are in simple English. One hundred and forty questionnaires were distributed among the students in various PG courses. Out of 140 questionnaires 126 questionnaires were received back. The response rate was 90%.The investigator selected 126 questionnaires for the analysis and interpretation of the data.

5. Analysis

Table -1. Gender wise distribution of respondents

Gender	Total	Percentage
Male	49	38.88
Female	77	61.11
Total	126	100

Table-1 shows the gender wise distribution of respondents. The numbers of female respondents 61.11% than the male counter part 38.88% respondents.

Table-2 .Frequency of visit to the University Library

S.No	Frequency	Total	Percentage
1	Daily	49	38.88
2	Twice in a week	17	13.49
3	Once in a week	3	2.38
4	At free time	51	40.47
5	Occasionally	6	4.76
	Total	126	100

The data from the above table-2 shows that majority of the respondents (40.47%) are visit the library at their free time followed by daily visit (38.88%). Only 4.76% of the respondents visit the library occasionally and 2.38% once in a week. The findings show that the students visit the university library frequently.

Table-3.Frequently preferred documents by the students

S.No	Document category	Total	Percentage
1	Text Books	105	83.33
2	periodicals	16	12.69
3	News papers	41	32.53
4	Reference books	16	12.69
	Total	126	100

The Table-3 shows the responses from the students about frequently used documents in the V.S. University college library. Most of the respondents (83.33%) are using text books to meet their course work, followed by news papers 32.53%.Periodicals and magazines were used by 12.69%, and reference books (12.69%).

Table-4.Methods used by the students to found books in the Library

S. No	Methods using by the students	Total	Percentage
1	Searching the book shelves directly	94	74.60
2	Taking assistance from the library staff	23	18.25
3	Taking assistance from friends	9	7.14
	Total	126	100

The above table-4 indicates the responses to the question methods preferred by the students to found books in the VS University library. It revealed that majority (74.60%) of the respondents prefer to search the book shelves directly. Taking assistance from staff was noticed among 18.25% of the respondents. Only 7.14% of the respondents took the assistance from their friends.

Table -5 Best sources for collecting background information

S.No	Source	Total	Percentage
1	Journal Article	19	15.07
2	Book	88	69.84
3	Encyclopedia	19	15.07
	Total	126	100

The responses from the students reveal that majority of them are not having proper understanding of the importance of encyclopedia. Only 15.07% stated that encyclopedia is the best source for collecting back ground information on a topic. Majority of the respondents (69.84%) opined that books were best source, where as 15.07% expressed their opinion journal article was best source to collect the information.

Table-6 Usage of internet to collect information for study purpose

S.No	Response	Total	Percentage
1	YES	109	86.5
2	NO	17	13.49
	Total	126	100

The present study also aimed at knowing about the extent of use of internet by the PG students for academic purpose. The responses reveal that majority 86.50% opined that they use internet for collecting information for their studies. Only 13.49% responded negatively.

Table-7 .Frequently used search engine

S.No	Search engine	Total	Percentage
1	Yahoo	6	4.76
2	Google	111	88.09
3	AltaVista	2	1.58
4	others	7	5.55
	Total	126	100

The information on internet will be search by using various search engines. The above table-7 presents the responses of the frequently used search engines among PG students. The table represents that high percentage of the respondents (88.09%) prefer Google, followed by 5.55% other search engines. Only 4.76% of the respondents prefer yahoo, whereas AltaVista was only 1.58% respectively.

Table-8 Awareness of using Boolean Operators

S.No	Boolean operators	Total	Percentage
1	AND	81	64.28
2	NOT	16	12.69
3	OR	19	15.07
4	No idea	10	7.93
	Total	126	100

To assess the search techniques among the PG students the question was asked" which combination of key words would retrieve the greatest number of records". The responses for the question are presented in the above table. The data reveal that majority 64.28% of the respondents opined that AND operator would help to retrieve the greatest number of records. Only 15.07 % are answer correctly. This indicates that majority of the respondents are not having knowledge of using Boolean operators in searching the information.

Table-9 .Awareness on creating a safest password

S.No	Password	Total	Percentage
1	Ad*71?	52	41.26
2	asdfg	11	8.73
3	1234	37	29.36
4	SAIBABA	23	18.25
5	No idea	3	2.38
	Total	126	100

The importance of creating a good, secure password is essential and it will help keep our identity safe on the internet. While attempting to ascertain the level of knowledge that the students have to create secure and strong passwords. The responses in the above table show that less than 50% (41.26%) of the respondents are only given correct answer. While 29.36% opined that 1234 is a safest one. This shows the lack of knowledge regarding the creation of secure and safe password.

Table-10 Awareness on Plagiarism

S.No	Correct meaning of plagiarism	Total	Percentage
1	Presenting the work of others as your own	37	29.36
2	In correct use of foot notes	19	15.07
3	To copy another work by citing the source	15	11.90
4	No idea	55	43.65
	Total	126	100

To know the students awareness about plagiarism the question was asked. The responses show that majority of the respondents (43.65%) have no idea about this word. Only 29.36% answer the question in correct way. The finding shows that students have lack of knowledge in this area.

Table-11.Awereness on Copyright information

S.No	Correct term relating to copy right	Total	Percentage
1	Copy right	62	49.20
2	Fair use	15	11.90
3	Freedom of information	25	19.84
4	No idea	24	19.04
	Total	126	100

In order to know the students awareness on copyright, the data shows from the above table-11 that majority 49.20% of the respondents aware of copyright information.19.04% have no idea about this, remaining students given the wrong answers. Nearly half of the respondents have not full idea about the copyright.

Table-12 Awareness of Citations

S.No	Sources	Total	Percentage
1	Book	39	30.95
2	Journal article	48	38.09
3	A portion of a book	9	7.14
4	proceedings	11	8.73
5	No idea	19	15.07
	Total	126	100

In all types of scholarly and research writing it is necessary to document the source work with citations. For that purpose knowledge regarding citation is also an important aspect of information literacy. In order to know the awareness of citations among the PG students the question was asked. The data in the above table-12 shows that majority 38.09% of the respondents answer correctly, rest of the respondents doesn't have the correct idea regarding to citations.

6. Recommendations

- The University library should conduct an orientation program for the students especially for the new entrants on how to use and what information contained in various reference sources viz. Encyclopedias, Directories, Yearbooks, Dictionaries, Almanacs, News Digests, thesis and dissertations etc.
- University library management should provide sufficient infrastructure for implementation of information literacy program.
- In co-ordination with the teaching faculty the librarian could design an information literacy course module to train the students.
- Information Literacy should incorporate in the university curriculum; this will help the students a lot.

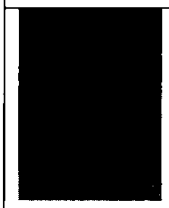
7. Conclusion

Information literacy is an important component in any university library system. The present study aimed to assess the information literacy skills of the PG students of different disciplines at Vikrama Simhapuri University College, Nellore. The findings revealed that majority of the students visit the library at free time and followed by daily (38.88%) and their frequent use of library resources was "Text Books". It indicates the students visit the University college library frequently to collect reading material for their study. The analysis of the response on the question 'best source for collecting background information' many of them may not given right answer. Only 15.07% of the respondents stated encyclopedia is the best source. This shows the lack of knowledge regarding the reference sources among the students.

The findings of the study show that most of the students used internet for academic purpose for collecting information for their course work. This is a good sign .With regard to frequently used search engines "Google" domination is continue. When it comes to use of Boolean operators only 15.07% correctly answered the question, this shows the lack of knowledge among the students in use of Boolean operators. In order to ascertain the level of awareness among the students in creating a safe and secure password one question was asked, the findings shows that less than 50% are only responded positively. The present study also gathered details related to plagiarism, copyright and citations. Results revealed that majority of the students are lacking knowledge on ethical and legal use of information.

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Information Literacy in College Library

Vivek S Sathe **Ganesh D Kulkarni**



Information Literacy is very important aspect for the users and development of college education. Information literacy makes the person capable to recognize when information is needed & how to locate, evaluate & use effectively of the needed information. This paper throws light on various aspects of Information Literacy like its meaning, components, characteristics, objectives, need etc. Paper also describes the role of Information Literacy in college libraries, Role of Librarian, Library Activities towards Information Literacy, Advantages of Information Literacy, Barries in Information literacy etc. This paper also presents the brief sketch of Information Literacy Model, Impact of Information Literacy.



Information Literacy, Information Literate, College Library,; information Literate Student

1. Introduction

The greatest challenge for society in 21st century is keeping pace with the knowledge and technological expertise necessary for finding, applying and evaluating information. It is acknowledged that we live in an information rich society, where the amount of information and knowledge in the word is presently doubling every two years (Thornburg, 1997) and will double every 12 or 18 month in the year 2001[1] (Breivik & senn, 1994, p 7-8).

The information society calls for all people to become information literate which means that they should not only be able to recognize when information is needed but also be able to identity, locate, evaluate and use effectively information needed for decision making or fulfilling different goal's-IL is increasingly important in the present context of the information explosion and related uncertainties about its authenticity, validity reliability.

Information Literacy is the vital process in the modern changing word which is mostly used for higher education. IL enables people to interpret and make informed judgment as users of information sources, as well as to become producers of information in their own right. IL means information awakening in person about the needed information. Information literacy forms the basis of life long learning, It is common to all disciplines, to all learning environment and to all level of education. It enables learners to master content & extent their investigation become more self directed. Govt. of India has planned to run many programmes to make people information literate. There are project like e-government project, Sarva Shiksha Abhiyan(SSA), District Primary Education Programme (DPEP), National Literacy Mission etc. which are playing amazing role in information literacy and the school & social, economic and cultural relevance and its immense potential to improve the society.

IL is becoming a strong pillar of knowledge society. The most important role of the college libraries & librarian is to educate the users-students in college environment for effective use of information either through print texts or electronic text via internet. In college libraries IL helps the students to learn about & how to utilize information tools & materials in their own libraries. Information literacy (IL) has been known by many different names. Library orientation; bibliographic instruction, user education; information skills training, Information fluency, library instructions, Information competencies etc.

2. What is Information Literacy?

Information Literacy knows when and why you need information, where to find it, and how to evaluate, use, and communicate it in the ethical manner. They have also created more in depth guidance on the skills required to be information literate.

The American Library Association (ALA) Presidential Committee on Information Literacy, Final report states that[8] "to be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate & use effectively the needed information."

According to Doyle (1992)[9], Information Literacy is defined as "an individual's ability to recognize a need for information; identify and locate appropriate information sources; know how to gain access to the information contained in those sources; evaluate the quality of information obtained; organize the information; and use the information effectively." An information literate individual is able to:

- Determine the extent of information needed.
- Access the needed information effectively and efficiently.
- Evaluate information and it's sources critically.
- Incorporate selected information into ones knowledge base.
- Use information effectively to accomplish a specific purpose.
- Understand the economic, legal and social issue surrounding the use of information and access and use information ethically & legally.

3. Components of Information Literacy

According to Lokhande and Gadge Chikae,[11] components of Information Literacy are as follows.

- **Basic Literacy: Reading** & writing, speaking & listening, counting & calculating, perception drawing.
- **Library Literacy: Library** Literacy is too important to every student how the library can help.
- **Media Literacy**: Media Literacy includes an understanding of the many different types of media and the purposes for which they can be used.
- **Technology literacy** : Like basic literacy, technology literacy is a continuum of skills that can always be improved and like Library Literacy, students receive technology experience and instruction in a hit or mass fashion depending on which teachers they may have over the years.
- **Visual Literacy:** Visual Literacy means the skills & learning needed to view visual and audio/visual materials. Skeptically, critically and knowledgably. Visual literacy is the link between Media Literacy and Technology Literacy.

4. Meaning of Information Literacy: Information Literacy constitutes of:

- Understanding the processes of identifying, accessing and delivering of information both current and retrospective
- Formulation of different search strategies to access relevant information.
- Evaluating the reliability of various information channels.
- Mastering certain basic IT skills for e-readiness.

Information Literacy is knowing when & why need information, where to find it, and how to evaluate use & communicate it in ethical manner.[12] Information Literacy is knowledge rather than simply skills achieved by education rather than training, created through partnership between professionals and is a lifelong endeavor that is contextual in field & service access. Often Information Literacy, Library Literacy, Literacy, Media Literacy, Computer Literacy, Network Literacy and Digital Literacy are erroneously used as synonymous terms.[12]

5. Characteristic of Information Literacy :

Information Literacy enables the students to:

- Recognize the accurate and complete information as the basis for Intelligent decision making.
- Recognize the exact need for information.
- Formulate the questions based on information needs.
- Identify the potential information sources.
- Develop appropriate search strategy.
- Access the information sources using technology.
- Evaluate information.
- Organize the information for practical application.
- Integrate new information into the existing fabric of knowledge.
- Use of information in critical thinking and problem solving activities.

6. Objectives of Information Literacy

Following are the objective of Information Literacy

- To recognize an information gap.
- To construct alternative strategies to reduce the information gap.
- Recognition of importance of and responsibility for information.
- To store the information for future use.
- To acknowledge the sources of information and ideas.
- To become more self directed.
- To enable learners to master contents and extent their investigations.

7. Need of Information Literacy

Too much information can create a barrier in own lives. The information barrier is produced by the huge account of information, the speed at which it comes to as from all directions the need to make fast decision and the felling of anxiety that we are making decision without having all the information that is available or that we need. Information Literacy is the solution to solve the information barriers.

IL is very important today owing to ICT and its application in libraries & information centers for maximum utilization of information resources in teaching, learning & research. An Information Literacy Programme is the need of the hours. It makes the end users competent enough for retrieving information as per their needs. The need of Information Literacy may be essential due to the following reasons.

- Advent of Information Commutation Technology
- Changing Shapes of Libraries.
- Rapid increases in the stream of information due to information revolution.
- Vast variety of information sources.
- Wide dispersal of information.
- Increase in number of users, and
- Research on complex & interdisciplinary topics.

According to Khaparade & Gajbhiye, the the need of Information Literacy

- Programme in India is also essential, due to following reasons.

- To become independent learners.
- To develop information literacy skills in learners.
- To make the common people part of Information technology revolution.
- Word wide web has taken the new shape hence there is need to promote information literacy.
- To provide knowledge & motive people to acquire IT ability.
- To help librarians to develop, access and improve their information literacy programme.

8. Role of Information Literacy in College Library

Information Literacy in College Library is necessary for both staff and student. The goal of information literacy education is to ensure that students are equipped and encouraged to learn for the range of information resources available in the library. In other words they should acquired over a course of study or through staff development opportunity.

- **Library Activities towards Information Literacy** :

College Librarian should develop Information Literacy Programmes for users. College Librarians can make users aware of information through following activities.

- **College Prospectus:** Inclusion of detailed information regarding procedure process, collection services, rules & regulation etc. in college prospectus which is updated yearly.
- **Library Brochures:** Publication of library hand book / Brouchers which includes detailed information regarding library.
- **Book Talk:** 10 to 15 students can be selected to take part in discussion an a specific book and script reading session can be arranged on a specific book.
- **Counseling Center:** Latest Information Literacy regarding the syalbi of various competitive examination & employment opportunities is provided through this center.
- **Readers club:** Can be establishing to promote reading culture among the readers.
- **User education program:** This program can be introduced through lecture method and by arranging visits to library.
- **Aids in co-curricular Activities:** News paper clipping files and books related to the conducting co-circular activities play an important role in this regard.
- **Book Exhibition:** Can be organized to encourage readers to in-calculate reading habits among themselves.
- Aid in Educational & Research work.
- Author Reader visit program
- Writing wise thought on board daily
- Films / Movie club.
- User Orientation Programme.
- Quiz and Debate.
- Best Readers Award
- Use of Information Communication Technology.
- Class Room teaching by Librarian
- Library Visit.

9. Role of Librarian

The librarian has to play a major role in implementing the information literacy in college library. Student should make aware of need of information & motivating the use of information. Librarian play an important role in developing information literate community.

Librarians are key personnel in the implementation of resource based programmes. They have to look more too online and other electronic sources to meet the information needs. They can design an information literacy curriculum which matches student capabilities, because they have expertise and knowledge to teach these skills. They are leaders in IT as well as extended resources across many disciplines. Their experience with information finding tools gives them a context for the application of new tools such as World Wide Web. Today they are knowledge managers & educators. Today, librarians are really in the most favorable position to be leaders in developing information literate community.

Thus librarian plays a significant role to promote information literacy in students as well as staff. There exists a gap between Lsibrarians and the users information needs. To bridge this gap they need to educate and re-educate themselves to acquire new skills and competencies role and need to cultivate the concept of life long learning of information literacy skills. Some short term courses for user orientation programmes may be organized in the libraries for the purposes. There may be two components of the course for information literacy.

- One is orientation, which is primarily concerned with the way of introducing the users to the general techniques of library usages and services available and to the organization layout and facilities of a particular library. During orientation library staff delivers a lecture, which introduces the program, demonstrate the use of the catalogue / OPAC readers how to access the self paced on-line tutorial, Readers work through library catalogue unit of the tutorial and also complete an exercise. They are able to create a network account and configure an e-mail account during one of their orientation week session.

- Other is instruction that is concerned with learning to make use of the information resources available with specifics subject disciplines. It consists of library staff demonstrating CD-ROM network and web-based databases and searching the internet using search engines and subject gateways. A lecture by library staff called researching a topic is another great motivation for readers to appraise critically the material they find, especially information found on internet.

10. Advantages of Information Literacy :

- Motivation for self –directed learning
- Expansion of knowledge through substantive operation of knowledge creation .
- Synthesis of data and information into knowledge.
- Enhancement of the critical thinking
- Appreciation for lifelong learning.
- Appropriate and critical application of information and knowledge in problem solving.
- Incorporation of validated information in the personal or corporate knowledge base.

11. Barriers in Information Literacy. :

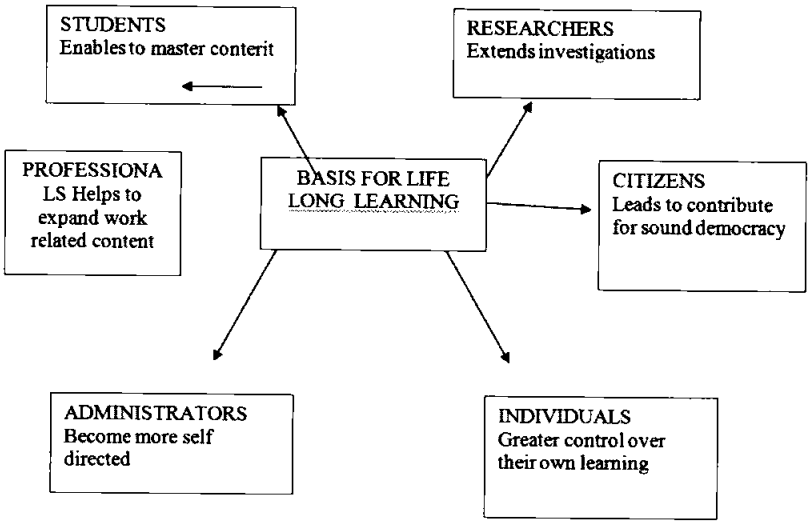
There are several reasons responsible for ineffective information literacy programs, some of them also at as barriers in the Information Literacy Program.

- There is no standard information policy to guide information literacy.
- There is lack of awareness among student about information literacy session on offer.
- There is lack of available resources, such as CD-ROM's to support hands on practice especially in rural areas.
- Inadequate library staffing.

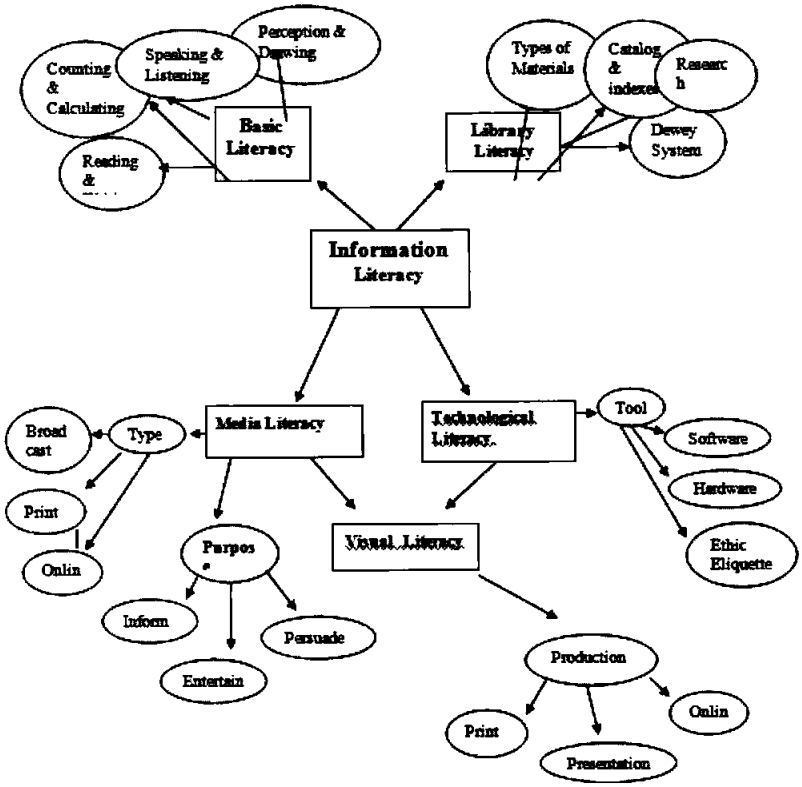
12. What is meant by Information Literate Student?

Information is available from many sources and in many formats such as printed texts, television, videos, library databases, websites & more. To be "Information literate." One needs to know why, when and how to use all of these tools & thinks critically about the information they provide. One can't be come information literate overnight, His abilities will improve over time as he gain expertise in the topics he chooses to investigate and as he practice searching for, selecting and evaluating the information and ideas he encounters. In nutshell Information Literate Students are supposed to.

- Be competent, independent learners;
- Actively engage in the world of ideas;
- Confidently solve problems.
- Know what is relevant information;
- Use technological tools to access information & communicate;
- Operate comfortably in situations where there are multiple answers or no answers;
- Have high standards for their work & use information ethically.
- **Impact of Information Literacy**



- **Information Literacy Model**



13. Conclusion

To make effective students, Information Literacy Programme must be included in the Curriculum. Information Literacy should also made one of the desired learning outcome required for graduation. Information literacy is a pre-requisite for student and educational institutions to successfully survive & complete in the 21st Century & beyond. Information literacy competency extends learning beyond classroom settings and provides practice with sefl-directed investigation. Today Information Literacy has become a global issue calling for greater attention. For this, Librarian has to play important role & take initiative in implementing Information Literacy Programme in College Library. Information literacy is essential skills in 21st century and forms the basis of life long learning. It is noted that Information Literacy Programme is a continuous process which needs to be frequently updated as per the demand of the college environment. In College Libraries, librarians should actively contribute to the student learning process, in their search to enhance or develop the skills, knowledge & values needed to become lifelong learners.

The authors of this paper feels that off period in the time-table can be utilized for Information Literacy in general not as the medium of time pass or entertainment by majority of the students.

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Information Literacy Initiatives through Faculty-Librarian Collaboration: *A Suggested Framework for Higher Education*

Deshpande, S M **Dakhole, P S**



Libraries play a vital role in supporting their parent institutions to achieve their objective effectively. Librarian and faculty members are both involved in teaching students how to make use of the information resources available in their campus library. They have many mutual goals and concerns. Both want students to develop a greater understanding and respect for books, journals and other intellectual property. Collaboration between faculty and librarians is essential to enhance students learning and research, and help them develop their information competencies thus make them information literate. The paper discussed the need of strong faculty-librarian collaboration and also intends to get attention of academic policy makers, faculty and library professionals on the issue.



Information literacy, Librarian-faculty, Collaboration.

1. Introduction

Today's age is an information age and full of ICT enabled services in every field of human life. Information is being codified in digital form. Information literacy is a vital skill to survive in this digital era. Information literacy is important in the contemporary environment of rapid technological change and proliferating information resources. Because of the complexity of this environment individual are faced with diverse information choices in their academic studies. Information comes to them in various formats, raising questions about its authenticity, validity and reliability.

2. Collaboration for Information Literacy

Resource-based learning involves active learning environments where students under the supervision of teacher/facilitator utilize a variety of information resources to solve problems. Librarians are uniquely qualified to partner with faculty to provide the resource expertise and instruction in their use. Teaching information skills will be the expertise which librarians bring to the partnership. Librarians are prepared to instruct students in finding, evaluating, organizing and applying information to problem solving. They are ready to teach students and faculty the methodology and approaches required to effectively locate and use electronic information sources (Rader, H.B. 1995).

3. Librarians as Partners in Promoting Collaboration with Faculties

Traditionally, faculty members have been actively involved in library affairs, especially in collection development and by serving on an advisory committee on the library along with the librarian and students representatives. Issues of concern discussed in advisory committee meeting.

To initiate collaboration with faculties the librarian should act as liaisons to each department, assisting with collection development and faculty research queries. A bibliographic instruction programmes should be arranged in class rooms. This will enable the librarian to visit the various teaching departments frequently. Thus cordial relations with many departments can be established.

4. Need of Faculty-Librarian Collaboration

Why is faculty-librarian collaboration worthwhile in language and classroom interaction?
Librarians and teaching faculty have many mutual goals and concern. Both want students to develop a greater understanding of and respect for books, journals and other intellectual property. Both want to enhance

student literacy, particularly information literacy and help students become writer, problem solvers, critical thinkers, self directed and life long learners. Lastly both want to build the social and learning community on campus. Librarians and faculty have a great deal to offer students and each other, especially in this " Information Age". To succeed in the university, student must be able to;

- Work independently on computers, using electronic databases, online catalogues and the internet, as well as print resources
- Evaluate, analyze and synthesize information and
- Understand issues of copyright, access, privacy, free speech and censorship.

Faculty-Librarian collaboration can yield many creative projects that enhance Instructions. These endeavors come in all shape and sizes. They may be formal or informal, individual or institutional or an ongoing process. Traditionally bibliographic instruction is very broad and covers topics like library services, general information on the library's website, which often offered to incoming students. Course-integrated instruction is a newer, more focused option for faculty. These are customized teaching sessions that emphasize discipline specific information literacy (Isabella, 2005).

According to (Williams & Wavell 2007), meaningful and effective, training/ academic program on information literacy should be embedded in the regular classroom activities in academic institutions such as schools, colleges and universities. Examples of classroom activities within which information literacy can be embedded are doing research writing essays, working on projects and similar other activities. Both teachers and librarians become essential components in such program. Teachers are directly involved with setting the activities and tasks in which learners apply information to develop their knowledge; librarians are for providing guidance for accessing and evaluating information. This model necessitates collaboration between faculty/ teachers and librarians.

5. Challenges for Faculty-Librarian Collaboration

The proposed collaboration may face serious challenges from two perspectives. One of those is the preparedness of the librarians for teaching in classrooms. This kind of program requires capability development of librarians with respect to designing or helping the faculty to design appropriate course works which will involve information literacy programs, ability to teach in a subject class and subsequent interactions with the students, and ability to evaluate the students' performances. As such courses in library and information science do not include training on teaching and this may be a future need for Library & Information Science education in India (Bhattacharya Swati, 2009).

There are some obstacles in faculty-librarian partnership. Professors and librarians have substantially different professional culture. They underestimate librarians and view them as subordinates. Faculty has simply never thought of how librarians could help them achieve course goals. These factors affect the collaboration.

Another perspective is faculty-librarian perceptions about each other. The proposed structure of information literacy program demands an educational mission that involve teaching and yet is naturally rooted in the structure, functions, and expertise found in academic libraries rather than within higher education's accepted teaching segment, subject faculty. This can lead to an uneasy situation in which a group which predominantly and exclusively was seen as support providers can be viewed as encroaching the area that is teaching which is considered legitimate for faculty members only (Owusu-Ansah,2004).

However, Librarians are in a unique position to become partners with faculty in curriculum reform and achieving resource-based learning for students. To achieve this new role, librarians will have to break out of their traditional reactive mode and become leaders and innovators in their interaction with faculty (Rader H.B., 1999).

6. Suggestions for successful collaboration

Dynamic librarian-faculty interaction is most important in order to build strong collaborative instruction programmes. From the various experiences described in the library literature librarians need to be aware of the following when building partnerships between faculty and librarians:

- Plan carefully in regards to resources involving, staff, technology, facility and time.
- Know your faculty and understand the curriculam.
- Remember that faculty's role is central to ensure success.
- Understand the course content you want to work with and how information resources will fit into it.
- Utilize teams and each team member's competencies.
- Start small with pilot projects.
- Revise based on evaluation and feedback.

To best serve the needs of faculty, librarians need to understand the opinions of these users. On the other hand, faculty members are expected to cooperate with the librarians in different ways. They can help in selecting relevant information sources. Their opinions about the services provided to them and their students are also appreciated. Librarians and academics are becoming increasingly aware of the need to collaborate in various areas, such as information literacy, collection development and user services.

7. Conclusion

Now a days teaching and learning are undergoing major revisions and opportunities for librarians to collaborate with faculty in bringing about changes in the university curriculum. To be successful, librarians need to be alert, creative and informed about what is happening on their college campus. Many examples of faculty-librarian partnerships are already in existence and new ones are created every day. Librarians who started a few year ago to offer internet workshops and technology instruction for faculty are now finding themselves in situations where faculty are seeking their advice and help in rethinking teaching. This is the situation towards which we are striving.

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Information Literacy Skills for Library Staff: *A Case Study of three Selected Colleges of Guwahati (Assam) - Cotton College, Handique Girls' College and B.Borooah College*

Maya Moyee Narzary



The present case study is confined to explore the information literacy skill of the librarian/ library staff of three most sought after college of Guwahati city i.e. Cotton College, Handique Girls' College, and B. Borooah College. In this information age and ICT driven society, use of information has different dimensions which is amalgamated with the way the users retrieve information from different web resources with the required skills to hit on the required information. Simultaneously, the library professionals have the sole responsibility to guide the users in the easy retrieval and effective use of information.



Information literacy, Information literacy model, Academic libraries, Human resource development.

1. Introduction

Since the independence, the State of Assam underwent different remarkable changes and steadily growing with other states of the country. The State has registered 6.7 percent (base year 2004-05) growth rate in the first four years of the 11th five year plan. The State is not only endowed with natural beauty but has the rich natural and mineral resources and it has the credit of having Asia's first and world's third oil refinery in Digboi i.e. Digboi Refinery.

Agriculture plays a vital role in the socio-economic development of the State as the State has net 28.10 lakh hectares (2008-09) land out of the total geographical area of 78.44 lakh hectares for cultivation. Besides, many industrial establishments in the State are also contributing to the states' economy in particular and of the nation in general. Some of the major industries in the State are: oil refineries, tea industries, fertilizer plants, cement factory, paper mill, jute mill, rubber industries, etc. As per the Tea Board of India (2009) there are 5200 small tea growers out of which 3767 were registered with the Board. Assam tea is famous for its taste and quality all over the country. This particular industry is earning substantial foreign exchange and providing daily employment to more than 6 lakh people in average. With the state economy, literacy rate of the State is also increasing as it was 63.25 percent in 2001 census and it raise up to 73.18 percent in 2011 census. High literacy rate will somehow be instrumental in raising the awareness about information literacy and its importance in every sphere of life.

2. Objectives

The study is restricted to the following objectives:

- To make an assessment of present status with regard to information literacy
- To suggest information literacy model for library professionals/staff.

3. Methodology

In the academic libraries, information literacy is mainly concerned to the librarian as far implementation of information literacy is concern. Nevertheless the support of the parent body is prerequisite to initiate such kind of programs in the academic libraries. Therefore to carry out the study, 1 questionnaire comprising twenty two questions required for the purpose has been distributed to the concerned librarian in three selected colleges under study of Guwahati. Thus in totality 3 questionnaires were distributed among the librarians and all of them have responded to the questionnaire. Moreover different primary and secondary literatures are also reviewed to prepare the paper.

4. A Glimpse of The Colleges Under Study

There are many colleges in Guwahati which includes both government and non-governmental /private. But the three colleges under study are the most sought after college for the student community. All the three colleges are mainly providing general courses along with some self supportive courses. Among the three colleges it is worthwhile to mention that Cotton College is the first Government College in the undivided Assam, so to say in the North Eastern region catering to the educational need of the entire fraternity. It was established before independence under the British Rule in 27th May, 1901.The college was started with 37 and 2 students in first and second year respectively with the faculty strength of 4 excluding the first then Principal, Prof. Frederick William Sudmersen (1901-1926). Presently more than 5000 students are getting enrollment having more than 236 dedicated faculties and 21 departments in the P.G level.

Likewise, Handique Girls' College was also got established in the year 1939, it was the first Women College in North Eastern region. Since its inception, the college has the mission of 'the enrichment of Society through the transmission of knowledge from one generation to another' and goal as 'the advancement, development and empowerment of women by imparting quality education'. The college has more than 80 dedicated faculties who are serving to more than 3300 students. B. Borooah College also came into existence in 1943 with a mission to act as 'a nurturing ground for the attainment of academic excellence and professional competence'. Gopinath Bordoloi, the first Chief Minister of Assam was the first Principal of the college. Presently college has nearly 100 faculties and 3000 students.

5. Analysis and Interpretation of Data

The status of the library staffs in these three colleges is given below in Table I:

Table I: Library Staff

Name of the Colleges	Designation & Professional Status	Qualification	
		Academic	Professional
Cotton College	Librarian(1)(professional)	M.A	MLISc, M.Phill
	Library Asst.(4)(2 professional, 2semi-professional)	B.Sc, LLB M.A, B.Ed. B.Sc., B.A	B.Lib.Sc. MLISc. Pursuing BLISc.
	Library Clerk(1) (semi- professional)	B.A	Pursuing BLISc.
	Grade IV(7)(non-professional)	Under matric, undergraduate	---------
Handique Girls' College	Librarian(1)(professional)	B.Sc (Hons)	MLISc.,M.Phill, Ph.D.
	Asst. Librarian(1) (non-professional)	B.A	-----
	Library Asst.(1) (non-professional)	HSSLC	------
	Professional Asst.(2) (professional) (contractual)	B.A	MLISc., M.Phill
	Grade IV(3)(non-professional)	-------	-------
B. Borooah College	Librarian(1)(professional)	B.A	MLISc.
	Asst. Librarian(1)(professional)	B.A	MLISc.
	Library Asst.(1)(non-professional)	B.A	---------
	Grade IV(5)(non-professional)	Under Graduate	----------

And the ICT infrastructure in the college libraries under study, which is prerequisite for the information literacy program is also given below Table II:

Table II: ICT Infrastructure

Name of the Colleges	Fully Computerized	Network Connectivity	Library Website
Cotton College	Yes	Yes	No
Handique Girls' College	Yes	Yes	No
B. Borooah College	Yes	Yes	No

- **Users of the Library:**

Libraries are meant for use i.e. effective and efficient use of the different library resources. Depending on the type of library, its function, users and their needs also vary. Moreover due to the proliferation of digitized information, the notion of use and access to information has also been changed. In academic libraries, users are mainly referred to the faculties and the students of the particular college/university. Though the non-teaching staffs of the particular establishment are also the bona fide users of the library, but generally they are the rare user of the same. Besides in many cases in academic libraries, non bona fide users are also allowed to use the library with some special conditions.

In the college libraries under study, Cotton College Library has highest number of users (i.e 4,984) including faculty, student and staff. The number of users in the respective libraries is given below in Table III:

Table III: Library Users

Name of the Colleges	Faculty	Student	Staff	Others	Total
Cotton College	248	4500	236	-----	**4,984**
Handique Girls' College	81	3306	20	2(casual users)	**3409**
B.Borooah College	100	3000	31	50	**3,181**

- **Collection Strength of the Libraries**

Collection refers to the resources of the library available both print and electronic form of documents. While print resources signify to various forms of documents such as, books, journals, reports, digest, encyclopedia etc., electronic resources connotes to resources like, e-book, e-journals, e-reports etc. Libraries take many initiatives to facilitate the users in providing multiform of documents to have a wide range of choice to the readers. To render different value added new services to the users digital resources has become a part of the library collection. Further, proper and authentic, user-centric collection development depends on the collection development policy of the concerned library. Data relating to the collection development of college libraries have been placed below in Table IV:

Table IV: Collections of the Library

Name of the Colleges	Total No. of Books	Total No. of Periodicals	Reference Books	Non Book Materials	No. of Computers	Classification	Cataloguing	Other
Cotton College	116991	50	2786	300	13	DDC 22nd ed.	AACR-II	E-books, CD& DVD, E-journals,
Handique Girls' College	44810	28	1840	143	20	DDC 22nd ed.	SOUL 2.0(MARC 21)	Photocopy machine, Barcode reader, barcode printer, scanner
B. Borooah College	45700	29	20000	00	11	DDC 23rd ed.	AACR-II	Atlas, photocopy machine, printer

The Table IV reflects the collection development of books, Cotton College constitute the highest i.e. 116991 followed by 44810 and 45700 in Handique Girls' College and B. Borooah College. Further with regard to the total collections of periodical covered under study, it is revealed that Cotton College subscribes the highest i.e 50 followed by 29 by B. Borooah College and 28 by Handique Girls' College and thus keep first, second and third position respectively.

Likewise with regard to the reference book it is interesting to note that B. Borooah College possesses 20000 reference books followed by Cotton College and B.Borooah College with 2786 and 1840 reference books respectively. Again while making an analysis of procurement of non-book materials by all college libraries under study it could be deduce that 300 are the collections by Cotton College stands at apex having 300 followed by 143 by Handique Girls' College. While studying the number of computers available in all college libraries it could be revealed that Handique Girls' College is having 20 followed by Cotton College 13 and B.Borooah College 11computers. The overall analysis reflects that the college libraries mostly prefer to procure books and reference books. Procurement of journals in the college libraries under study has been given less attention due to the financial constraints

- **Services Rendered By The College Libraries**

Services are an integral part of the library function. Basically library services are meant for the users and the society as a whole. The library is recognized by its services. Data relating to the various services provided by all six college libraries under study have been grouped into five major components and the information of the respective library with regard to the library services have been obtained has been figured in the Table V:

Table V: Services of the Library

Name of the Colleges	Reference & Information Service	Documentation Service	CAS/SDI	Repro-graphic Service	Other Services
Cotton College	Yes	Yes	Yes	Yes	OPAC
Handique Girls' College	Yes	No	Yes	Yes	Internet, OPAC, N-LIST, Automated Circulation etc.
B. Borooah College	Yes	Yes	Yes	Yes	Internet, OPAC

It is interesting to note that the college libraries are providing the different services to the users which are really helpful for the user community.

- **Computer Skills Of The Librarians**

Computer skill is one of the important parameters to provide effective services to the users in an automated environment. It is also equally requires to process the information and making use of library resources effectively. As it is one of the important areas of information literacy it is essential to get acquainted with operations for handling information and dissemination. Data relating to this component obtained through questionnaire of all college libraries and submitted by the librarian of the respective college libraries are placed below in Table VI:

Table VI: Computer Skills

Name of the College	Computer Fundamentals	Programming Language	Internet	Multi-media	Frequency of Access to Databases
Cotton College	Yes	No	Yes	Yes	Daily
Handique Girls'College	Yes	Yes	Yes	Yes	Daily
B. Borooah College	Yes	No	Yes	Yes	Daily

It is a good sign that the librarians of the respective college librarians have the adequate computer skills and the librarians access internet daily. The table also reveals that programming language is not so practiced by the librarians.

- **5.7. E-Resources Available in the College Libraries:**

ICT has pragmatic value in transforming the educational scenario both in national and international. The college educations are no exception to it. Similarly the adaptability of ICT in library services equally altered the situation. The traditional collections in the library are insufficient to meet the varied requirements of the users especially the faculty due to multidisciplinary research alternatively leading thereby, the libraries to acquire electronic resources. E-resources add a substantial value in promoting education and research. The scholar has categorized the e-resources into three broad groups such as e-books, e-journals, e-articles. Data relating to these components are placed below in Table VII:

Table VII: E-Resources

Name of the College	E-Books	E-Journals	E-Articles	Others
Cotton College	Yes	Yes	No	Provided under N-LIST, INFLIBNET
Handique Girls'College	Yes	Yes	Yes	Provided under N-LIST, INFLIBNET CD-ROMs/DVD
B.Borooah College	Yes	Yes	Yes	Provided under N-LIST, INFLIBNET

The above Table VII reveals that in all the three college libraries besides the traditional form of resources, they also possess e-resources i.e. e-books, e-articles; and e-journals which are basically provided by INFLIBNET through N-LIST programme.

- **Training Programmes Organised in the College Libraries:**

Periodical training programme conducted by the library accelerate the use of library resources. This is essential in a technology based library services. Library adopts multiple technologies for acquisition of knowledge, organization of resources, and dissemination of services etc. with the help of technology. Therefore the readers require an environment to make use of the resources. Consequently the library organizes training programmes, orientation programmes, workshops etc. to abreast with the emerging technology. However the training programmes can not be confined to technology only rather can be extended for use of bibliographic resources etc. Data relating to these facets obtained through the questionnaire of all six college libraries are placed below in Table VIII:

Table VIII: Training Programmes Organized in the Library

Name of the Colleges	Use of Biblio-graphic Resou-rces	Inter-net Tools/ Search Strate-gies	Library Manag-ement Software Packages	Handling, Preservation, Conservation of Bk./N.Bk. Materials	No Partici-pation in any such Training	Others
Cotton College	------	-----	------	--------	Yes	-------
Handique Girls'College	------	----	Yes	Yes	------	Building Digital Library
B. Borooah College	----	----	Yes	-----	------	Computer Practical Classes for MLISc. Students of IGNOU

The Table visualizes that none of the college libraries impart any training to its user for use of bibliographic resources and internet tools/search strategies. While the training programme on library management software packages are being provided by only two college libraries i.e. Handique Girls'College and B. Borooah College, handling preservation, conservation are given by one college libraries i.e. Handique Girls'College. It could be analyzed that the two college libraries i.e. Handique Girls'College and B.Borooah College sometime provides programmes on building digital library and render computer practical classes for MLISc. of IGNOU students respectively.

- **5.8. Participation in Different Training Programmes by the Librarians**

Professional capabilities are augmented through various discussions, seminars, workshops, training programmes, etc are an integral part of the library. It not only enhances the personal capability of the library professional but also excels the skill and competency to handle the both traditional and electronic resources. In other words, such kind of programs encourages better human resource development. Many national and international bodies including various organization conducts such programmes for the librarians so as to meet the challenging requirements of users in meeting their information requirement. This has become essential in view of the changing information seeking behavior of the users. The relevant data obtained through the questionnaire is placed in Table IX:

Table IX: Participation in Different Training Programmes

Name of the Colleges	Regularly Attends Workshop /Seminar/Orientation/ Refresher Courses	Trained Library Staff
Cotton College	Yes	Yes
Handique Girls'College	Yes	Yes
B.Borooah College	Yes	No

Analysis of the Table reveals that all the three college librarians regularly attend the workshops, seminars, refresher courses etc. to excel the professional skill for implementation in the libraries.. Moreover two college libraries i.e. Cotton College and Handique Girls' College are having the trained library staff whereas B.Borooah College library do not have trained library staff.

6. Problems and Prospects in Implementation of Information Literacy

Information literacy requires instant application in the libraries to excel the services both traditional and electronic. Information literacy enhances the quality of services because of the acquired skill/competency and confidence by the librarians. The author obtained the views of the librarians regarding the implementation of information literacy in respective college library. All the concerned Librarians under study are interested to implement Information Literacy in their respective libraries for the greater benefits of the users/clientele in this digital era. As opined by the librarians of the colleges under study, they encounter certain problems beyond their control to implement. The prospects pointed out by the librarians are discussed below:

- Librarian of the Cotton College appraised about the publication of 'Student Guide' and suggested for innovative planning for bringing out other publication of the library to make users aware in using library resources.
- In Handique Girls' College orientation programmes, demonstration etc are initiated for both using OPAC and N-LIST of INFLIBNET. Further detail demonstration is given to the faculties and students in using N-LIST. He stresses that users should be made interested towards the use of e-resources and the different ways to access these resources. In the college level, if the user can access N-LIST, then it's the first step towards information literacy.
- B. Borooah College librarian has given stress on digitization in future and RFID setup in the library. No orientation programme is organized for the students. According to the librarian, for IL trained library professionals are required and for this a regional centre for advanced study for library professional may be established to guide and training.

6. Conclusion

In the present scenario initiation and role of the librarian in particular and library staff is paramount. They are only the authentic human resource to bear a torch in the direction of implementation of information literacy in their respective college libraries. Since in India, information literacy is a recent concept and there is no such policy to implement information literacy in colleges as in some of the countries of the world like- USA, Australia, Germany, etc. it is well recognized/accepted concept in their respective national or education policies for the effective information literacy practices. The study undertaken by the author reveals a good sign as the college libraries under study have the feasible prospect for the implementation of information literacy in their respective libraries. The college libraries under study have the sufficient number of collections and users as well. And it is also revealed that the respective libraries rarely conduct programmes for the users. There is no denying the fact that librarians/library confronts many problems/hurdles which are beyond their control. The librarians of the colleges under study are qualified and realizing the need and importance of information literacy for the greater benefit of the user community and the library staff as well should try to convince the parent body in the best possible way.

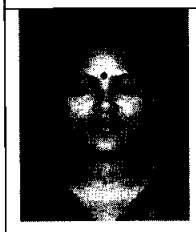
It is evident that the prerequisite factor for information literacy i.e ICT infrastructure and trained staff to support the programme is available in Cotton College library and Handique Girls' College library whereas in B.Borooah College has the qualified librarian but lacks trained staff. Nevertheless, the trained staffs are not trained enough for the information literacy programs. Besides having the computer literacy, electronic literacy, internet literacy and digital literacy; they should also be proficient in information handling, enhance acc , of information/database, content creation, evaluation of the electronic information and last but not the

least they should have proper knowledge about IPR and copyright. Thereby, the author suggested a model to be considered while going for training programs to update/develop their professional skills/human resource for better service to the users in the digital environment:

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Managing Libraries with Soft Skills

Babita Jaiswal



Library world has totally changed. Due to application of new technologies the procedures, tools and techniques of providing information to user have revolutized. It has become a challenge for library professionals to cope up with changing technologies. Library professionals can handle all the issues of modern libraries by having sound knowledge and skills. The present paper only focuses on soft skills required by library professionals. Soft skills help them to increase productivity at workplace and serve their user with greater efficiency. The paper explains different soft skills and present how to develop those skills in the form of matrix.



Soft Skills, Soft and Hard Skills, Library Management, Knowledge and Skill

1. Introduction

Our social institutions are changing. This change is very visible. The average size of a supermarket today is 7,000 square feet larger than in the beginning of the decade (Saekel 1991) Local pharmacies are being replaced by chain "drug stores". Hardware stores are being replaced by "superstores". Grocery stores now have coffee bars and markets have banks inside their stores (Saekel 1991; Sinton 1996b).The single-screen movie theatre has given way to the mall-based multiplex. We all are reaping the benefits of these changes. The main reasons for these changes are: Economic scenario which is changing globally and Invent of Information and communication technology and their adoption.

Nowadays institutions are reshaping and redefining themselves in terms of structure, working culture, values norms patterns etc. Libraries which are identified as one of the key elements for open access to information and crucial to democratic information society development are one of them. Information technology has contributed a lot to reshape the libraries like other social institutions Technologies offer new possibilities for libraries to raise the level of service in this changing scenario. "It is especially important now when the whole idea of education is stressing more and more independent learning and acting. All citizens must be able to find and use information. It is the key raw material - but it is a zero resource, if there are no access points to it and if documents are in chaotic order."(Mirja Ryynänen, 1999)

There are studies which present other sides of coin. Hashim & Mokhtar (n.d.), Sreenivasulu (2000) , Trushina (2004), Wallis (2005), Adomi & Anie (2006) ,Johnson (2007), Ademodi & Adepoju (2009)and others carried out studies on problems confronted by library professionals in changing information landscape and found out that Information technology has affected the skills and responsibilities of the librarians & users as well.

Information Technology has changed not only the face of information and information professionals but also the information seeking behavior of the users. For providing effective and better services to the users and in order to make maximum use of new technological tools different hard and soft skills is required. These soft and hard skills have become more important for managing libraries in recent times. Building and managing libraries in 21st century generate a need of library workers with diverse hard and soft skills applicable in the workplace.

2. Hard and Soft skills in managing libraries

- **Hard and Soft Skills:**

Hard skills are associated with specific technical abilities or solid factual knowledge required to do a job hese skills can be termed as "what you know" (Hunt, 2007). Hard skills are the technical skills including

programming languages, operating system skills, networks and communications (Snyder, Rupp & Thornton, 2006), foreign language skills, procedure skills, etc. On the other hand, soft skills can be termed as "how you use it" (Hunt, 2007). *Soft skills* can be defined as interpersonal, human, people or behavioural skills necessary for applying technical skills and knowledge in the workplace (Rainsbury, Hodges, Burchell & Lay, 2002).

Whether a job seeker or an employer looking to hire the best matched candidates for the company, the top desired skills in the workplace never go out of style or out of demand. These include hard skills acquired through education, training and experience as well as soft skills derived from personality traits, attitudes and ethics.

Over the last few years there has been a dramatic shift in a way skills are viewed in the libraries. Stakeholders are now recognising that no matter how qualified and intelligent librarian is, if they do not have strong soft skills they won't contribute to the workplace in the most meaningful way they can. Changes in libraries are so fast and quick that librarians who are agile, adaptable and creative problem-solvers can handle those changes.

3. Dimensions of Soft Skills

Good soft skills form the lubricant that greases the wheels of a successful transition from traditional libraries to modern libraries. In fact, they are so important that in recruiting and selecting the library professionals these should be one criterion. Soft skills are a hard necessity in their skill sets. (Sukhoo. Barnard, Eloff & Poll, n.d.) The following soft skills dimensions have been identified for the smooth management of libraries.

- **Dimension-1: Communication Skills**

Communication skills refer to the ability to convey ideas clearly and easily. Good and skilled communication is an important soft skill required by library professionals. Library professinals must have the ability to convey complex ideas easily and foster an environment that allows others to communicate with open heart. It has now become axiomatic truth that effective communication is the key to the success of any endeavour in which people are involved. The library field is no exception.

Communication is important for library managers because in transmitting information to users. It plays a great role. To increase the productivity and efficiency in libraries professionals needs to maintain good relations with each others. Chances of misunderstanding and misrepresentation can be minimized with proper communication system. Library managers need to encourage various means of communication like formal and informal meetings, informal discussions, phone calls, letters and reports etc. Internet communication can be used which is an extremely useful time-saving device.

- **Dimension-2: Teamwork Skill**

"The best teamwork comes from men who are working independently toward one goal unison." (Penny,n.d.). "I'm going to tell you the story about the geese which fly 5,000 miles from Canada to France. They fly in V-formation but the second ones don't fly. They're the subs for the first ones. And then the second ones take over - so it's teamwork."(Ferguson, n.d.) These two shows the importance of teamwork. To work in team require teamwork skill. Team work skill is very significant for managing libraries. For providing best to the users the setting of team is essential. Library work is a team activity. Professionals having this skill can ensure and encourage others to join team and create situations to promote effective teamwork. People working in team can guarantee the achievements of goal.

- **Dimension-3: Creativity**

Creativity is a quintessential attribute of human beings. When combined with our ability to record and benefit from accumulated knowledge, it makes us the highest-order species on the planet. (Ishaq n.d.).

Global CEO Study which surveyed 1,500 Chief Executive Officers from 60 countries and 33 industries worldwide believe that more than rigor, management discipline, integrity or even vision – successfully navigating an increasing complex world will require creativity. (IBM 2010). "Creativity is a great motivator because it makes people interested in what they are doing. Creativity gives hope that there can be a worthwhile idea. Creativity gives the possibility of some sort of achievement to everyone. Creativity makes life more fun and more interesting."(Bono,n.d.)

- **Dimension-4: Leadership Skill**

Leadership refers a process by which one person influences the thoughts, attitudes, and behaviors of others. Peter Drucker famously stated that "management is doing things right; leadership is doing the right things." A visionary leadership with innovative approach is a key to make changes successfully. Change is a process in which a most desirable and suitable future form of an organization is perceived and route map is decided to get this new shape. Libraries are also in the process of change. The library of the 21st century is not made up of bricks, mortar, or dusty old sheets of paper. Its collection consists of physical items and electronic files. Librarian with leadership quality can make decisions that are good for the library and its staff. Leadership articulates the mission, vision and values of the library organization, align the library with, and are supportive of the strategic directions and needs of the community. The library that lacks leadership lacks vision necessary to transform itself.

- **Dimension-5: Dealing with stress**

Stress refers to pressure, tension or worry resulting from problems. (Oxford Advanced Learner's Dictionary, 1999). Library professionals should also have a skill to deal with stress at workplace. It is quite evident that due to technological advancements the scenario of library is changing. Growing demands of users, squeezing funds and lack of proper knowledge professionals stressed and quite often they have to perform under pressure. A certain level of stress is important for the professionals to perform well and this type of stress is called eustress, which is good stress. When stress becomes excessive, it can cause harm to oneself or to the immediate surroundings. Professionals who have developed the ability or learn stress management can deal pressures and work with great efficiency.

- **Dimension-6: Time Management**

Time management is the act or process of planning and exercising conscious control over the amount of time spent on specific activities, especially to increase effectiveness, efficiency or productivity.(Wikipedia) These days most of the work in libraries such as digitisation, creating repositories, developing e-content and others are time sensitive. Very soon information process, techniques softwares etc. become isolate. So it is important for professionals that they have to complete every task in time. Professionals who have ability to organize and prioritize workload they would be able to complete everything accurately and on deadline. It will be highly valued.

- **Dimension-7: Interpersonal Skills**

Interpersonal skills are the life skills. We use every day to communicate and interact with other people, both individually and in groups. People who have worked on developing strong interpersonal skills are usually more successful in both their professional and personal lives. Employers often seek to hire staff with *'strong interpersonal skills'* - they want people who will work well in a team and are able to communicate effectively with colleagues, customers and clients.

Interpersonal skills are very much required for library professionals too. Library has become a whole new world of work and interpersonal skills are the key. Electronic publication and their management and electronic communications have changed the face of the library. Now success depends upon the combined cooperation, commitment and action of professionals and people—both face-to-face and across electronic

and cyber channels. That's why interpersonal skills are so critical to become effective managers. With the appropriate interpersonal skills librarians can more effectively manage libraries. And it leads to greater productivity, engagement, better understanding and relationship. With this skill conflicts, changes and stress can be easily managed.

4. How to develop Soft Skills

Soft skills revolve around personal relationships, character, and attitude. By developing these skills work performance can be increase and build stronger relationships. If soft skills do not come naturally library professionals need to learn how to improve soft skills. So they'll become a natural reflex dealing with people every day.

How to develop Soft Skills Matrix

Dimension	Skill	How to Develop
1	Communication	Listen, Listen and Listen ,have good content or knowledge, be strong in language, always check the communication, always think before speak, be positive, good command on the body language, be confident while communicating
2	Teamwork Skill	Listen team members, encourage people to share ideas, communicate frequently with team members, willingness to accept team decisions, be supportive, control emotion, and learn patience.
3	Creativity	Keep following own path, always ask, "How could I have done this better?" do not afraid with criticism, don't be perfectionist, initiate things
4	Leadership	Understand current leadership style, intellectual simulation, work on modelling qualities , have a genuine passion and enthusiasm for the work, express sincere care and concern for the members of their group both verbally and nonverbally, listen and communicate effectively, carry positive attitude, motivate team members
5	Dealing with Stress	Identify reason of stress, consider what can be controlled, do what you love, manage time, embrace mistakes, have some "me time", work smarter not harder
6	Time Management	Effective planning, to monitor how effective time building, flexibility in time plan, awareness about time management, take advice of others about time management
7	Interpersonal skill	Learn to listen. choose appropriate words, analyze communication, be relaxed, cool and calm, be positive and think positive, learn more about people and relationships with people.

The library is an integral part of the society that surrounds it. It is shaped and changed by many of the same forces that shape other types of institutions. Librarians need to recognize the changes that have already taken place in libraries, and to be aware of the ways in which broader societal changes are affecting other institutions. Then (rather than sitting idly by and passively observing the evolution of the library as an institution) they need to use this knowledge to actively reshape the library.

Libraries can and should be magnificent information centres that celebrate our vibrant society. Through motivation, communication, and good leadership, libraries and information centres can foster a successful and diverse team environment.

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Role of Internship program for developing Professional skills in Library professionals

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Classroom studies are confined only to books and theoretical learning. Application of these theories and lectures delivered in classrooms differ a little from the set format. Through internship, students get not only a first-hand experience of these theories, but also learn the applications of these theories in real challenges. As a form of practical education through work, internship meets young people, particularly students keen to gain experience through practical work in a job within a company or institution chosen, giving them the opportunity to translate theoretical knowledge into practice and to develop skills and experience. An internship program is beneficial not only for students but also for employers. Leading to increased competences and to training and professional skills and personal development, internship becomes a more attractive alternative for young people because it gives them the opportunity to be "a ringer" of an employee on the position you have in view. Without being employed, students can gain practical experience in a certain position, they need so much and they can also learn what responsibilities and tasks the job entails.
This paper attempts to define the place of internship in Library and Information Science profession.



Teaching, Internship, Internship in Libraries

Introduction

Several studies done elsewhere have indicated and concluded that a gap really exists between the quality of graduates produced and what the market demands (Mpairwe, 2010). For this and other reasons, training institutions and employers have accepted the need to seek mitigatory steps to bridge the gap. Among other steps, institutions of learning have introduced internship programs also referred to as field attachment in some of their degree and non-degree programs. There has also been the realization that imparting the relevant practical skills is a partnership between the training institution and the prospective employers through student internships. Internships have been hailed for integrating classroom education with practical experience in enabling graduates to develop their professional knowledge and professional skills (Beard, 1998). The same is the case with library professionals. The more experience or exposure in the working of library they get, the better job they get.

Before internship, theoretical knowledge through classroom is mandatory to fulfill the eligibility criteria of admission to internship programs. Let's start with concept of classroom teaching.

Classroom Teaching

Teaching is an art not a science, teaching is not like inducting a chemical reaction, it is much more like painting a picture or composing a musical melody, or on a lower level like cultivating a garden or writing a letter. One must immerse one's heart into it, one must remember that it cannot be done by formulae or you will spoil your work and your pupils and yourself – (Highest, 1950). Teaching involves an element of spontaneous communication between the teacher and the pupils, a form of self-expression requiring genuine creativity. The teacher is in many ways respects the prototype of an artist. The artist communicates at the same time that he portrays, in the same way that he sees it. The art of teaching lies similarly in the communication and projection of an essentially private experience.

Teaching, as conventionally understood by a traditional teacher, is the act of disseminating information to the learners in the class room. It is, generally, equated with telling. If we observe traditional class room teaching we find that either the teacher is delivering information or one of the students is reading

from the text book and other students are silently following him in their own text books. This probably is the concept of teaching held by traditional teacher.

In the last fifty years, a number of researches have been conducted on teaching-learning process. New methods and techniques have been developed on the basis of research findings. The traditional methods and techniques have been replaced by new methods and techniques in the last decades.

The traditional explanation of the term teaching which equates teaching with telling is not acceptable to the educators of today, because the recent researches in the field of teaching-learning have thrown light on some new concepts of teaching. The old concept of teaching as giving of information has been completely discarded. According to modern educationists, it is not even half the battle to tell the child things and to fill in information in his mind.

According to the changed concept, teaching is to cause the child to learn and acquire the desired knowledge, skills and also desirable ways of living in the society. The main aim of teaching is to help the child to respond to his environment in an effective way.

Internship

The purpose of the internship is to provide the intern with an opportunity to begin practicing, in a supervised environment, the knowledge, skills, and values developed in the academic portion of the program.

The internship can be one of the most important parts of a student's program. It will allow the intern to practice what has been learned in classes and will also be one of the first opportunities to show others what the intern is capable of doing. An internship is an excellent way to make professional contacts and can also lead to positive references from administrators, librarians, information managers, media specialists, teachers, and other professionals with whom the intern works.

According to Furco (1996) internships are defined as programs engaging students in service activities primarily for the purpose of providing them with hands-on experience that enhances their learning or understanding of issues relevant to a particular area of study. On the other hand, McMahon and Quinn (1995) note that internships are supervised work experiences whereby students leave their institutions and get engaged in work related programs, during which period they are closely supervised by experienced job incumbents.

Internships are therefore any carefully monitored piece of work or service experience in which an individual has intentional learning goals and reflects actively on what she or he is learning throughout the experience or duration of attachment.

From a variety of research available, internship programs have tended to benefit the student, the student's institution and the employer. However, for the student, it is the learning that is of utmost benefit. The individual can apply knowledge learned in the classroom to the workplace. The individual gains knowledge of the qualifications and duties of a position and can explore their interest in a field. The individual gains an understanding of the skills and knowledge required in the workplace.

Personal development - The individual gains decision making skills, critical thinking skills, increased confidence and self-esteem.

Internships vary in duration; they can last from a month (or less) to two years (or more) and may be part-time or full-time. Internships can take place in any work or service setting and be paid or unpaid. They may be part of an educational program and carefully monitored and evaluated for academic credit. They can be part of a learning plan that the intern develops for personal benefits. It is for these reasons that a number of models of internships have been brought to being.

Historical Perspective

Internship is a vital element of educational preparation for several professions, but the medical profession is both the best known and the original user of internship in the United States. The Medical school

at John Hopkins University became the first recorded American institution to establish an internship at 1880's. Internship has been a vital part of the medical program of education ever since.

In the field of education, there were not a great number of educational internships before 1920. At this time only seven universities offered the program. While these universities considered internship a desirable part of the educational program, it was not considered feasible to require internship of all graduates because of the teacher shortage.

During the depression which resulted in a scarcity of jobs, educational internship became an important part of professional in-service education and in some instances was the only means of entering the profession. As a result of this condition and the corresponding progressive movement, a foundation was laid for requirements of subsequent internship programs. The foundation laid emphasis on clinical experience.

Types of Internship Programs

According to the Employers' Internship Toolkit (2005), internships are commonly used term in experiential education. Internships take place during different times of the year: summer, winter or spring. These may be part-time or full time internships over different durations. Typical internships are entry-level, educational jobs that can be paid or unpaid and usually give you college credit for your work (but not always). Usually, these internships last for one semester, although sometimes you can find internships that last for two semesters. Hereunder, the different types of internships are discussed.

Cooperative Internships

Some colleges and universities use the term Cooperative Education for a certain type of workplace position that is experiential, that is, experience-based education. In this way co-ops are fundamentally similar to internships; students learn while applying knowledge and skills from the academic setting to a work setting.

Paid vs. Unpaid Internships

Internships are sometimes paid and sometimes unpaid. Ultimately, this is a decision of the employer. Some schools may have a policy on paying interns from their institution, but most will facilitate both types of internships for employers. However, when students are under unpaid internships, the following factors need to hold true for a legitimate internship where a company is not paying the student:

- . The work of the intern is an integral part of the student's course of study.
- The student will receive credit for the work, or the work is a requirement of graduation.
- The student must prepare a report of his/her experience and submit it to a faculty supervisor.
- . The employer receives a letter or some other form of documentation from the school indicating that it approves of the internship and it's educationally relevant.
- Learning objectives are clearly defined.

Independent vs. College Sponsored Internships

It is possible for students to engage in internships experiences either through the school, college or university that they attend or independent of them. Schools can have both loose and close relationships with various employers. Most colleges and universities will allow students to earn academic credits for participating in internships. It is also entirely possible for students and employers to arrange internships independent of schools. This approach is better suited for situations where internships are paid and learning objectives are secondary to performing a job.

Short-Term vs. Long-Term Internships

Internships can be either short-term – ranging from a few weeks to a month or two - or longer-term, lasting up to one year. During these internship periods, some interns might seek full-time engagement while

others may work only 5-10 hours per week. Weekly hours and length of the internship will depend on the needs of the library as well as any university requirements a student intern might be seeking to fulfill.

In-Person vs. Online

The vast majority of internships are completed in-person with the intern working physically within the hosting library. However, it is also possible to engage interns remotely via the Internet. This can be an especially valuable model of internship engagement for web-based projects and/or libraries that are located in more remote areas.

Ongoing Tasks vs. New Projects

Interns can be brought onboard to launch new library programs or take on still-to-be-started tasks. Alternatively, interns can be engaged to assist with ongoing tasks and responsibilities such as collection development or youth programs.

External Programs and Services vs. Internal Capacity Building

Interns can take on both external and internal projects. For example, you might have interns assist with community programs or other projects in which they will interact with and be visible to the public. Alternatively, interns might work exclusively on internal capacity projects like updating the library website, assisting with acquisition and cataloging, or training current staff on social media models.

Internships in Library and Information Science Profession

For years the library profession has toyed with the idea internships 'but without conviction or enthusiasm. Now while education for librarianship of is reshaping itself into a new pattern would seem a propitious time to review the idea in the light of the use being made of the internship by other professions and of current trends in library development and in library education. It is offered as a tentative statement in the hope that it will be considered, criticized, and improved by library administrators and educators alike.

In the days before 1887 the man who wanted to become a librarian might follow one of two courses:

(a) He might get himself appointed librarian of some library and there learn by doing, supplemented perhaps by observation in other libraries and by advice from other librarians; or

(b) He might persuade or permit another librarian to hire him and thus learn under the tutelage of his employer.

The latter course should have enabled him to master the essentials in a much shorter space of time if the employer knew how to run a library and was reasonably interested in showing someone else how. If the employer was exceptionally well informed and capable, he might teach more in a few years than his assistant working alone in an isolated one-man library could learn in lifetime, This method of learning how to do by working under the direction of someone who knows how to do is termed, as "apprenticeship." Often both parties enter into an agreement-one to teach, the other to work for so long for so much. The apprentice comes to the apprenticeship without any special training for the work he is to do and expects when he leaves it to know how to perform the work of a good assistant if not that of a chief librarian

(c) After 1887 a third course of action was open to the man who wanted to become a librarian, he could go to library school. Here several librarians would teach him systematically and progressively by means of lectures, assigned readings, problems, and discussions, and thus save even more of his time by teaching him more in one year than he could pick up as an apprentice in twice the time. The library school did not discard actual library work as a teaching method but added it to lectures, readings, problems, discussions, and laboratory work.

In the library field, practical experience was considered a vital part of educational program from the founding of Dewey's school of Library Economy at Columbia in 1887 until the Williamson report in 1923. Williamson "urged that the task of the school is simply and solely to give the student instruction, inspiration

and stimulus, and not to assume responsibility for any other element of his success." Perhaps due to Williamson's influences and in part to the fact that practical experience is associated with library education's fledgling efforts, practical application has largely been omitted from the education sequence. Recent eruptions of campus unrest have caused re-examination of all segments of higher education. Some educators and students maintain that practical application does provide the student with a more satisfying and complete education. Rothstein points out that students value clinical experience

- As a refreshing change of pace
- As a means of gaining confidence
- For enlargement of views and
- As a means of relating theory to actuality.

He urges that the place of practical experience in library education still be debated by the profession.

Benefits of the Internship Program

For the Intern

1. Permit close acquaintance with a first-rate library-in-action; promote an understanding of its objectives, its functions, its problems; and encourage careful and critical analysis of its procedures and service.
2. Give the intern through his observation of the staff of the library a standard of accomplishment with which he can measure himself in later years.
3. Bring about the use of what was learned in library school and by so doing demonstrate its value and make it more meaningful.
4. Provide an opportunity for the mastery of techniques but not necessarily for the development of skill.
5. Emphasize and encourage habits of work, of questioning and investigating Library problems that will carry over into the professional life of the individual in his later career.
6. Accustom the individual while under supervision to assume responsibility.
7. Emphasize the possibilities of accomplishment in the profession and reinforce professional attitudes and ambitions.

For the Participating Library

1. Help make better librarians. Contribute to the development of successful librarians what no library school can contribute and thus play an important role in the improvement of library personnel. Indirectly each and every library would, in time, profit from any improvement in the preparation of personnel.
2. Introduce a form of in-service training for department heads and assistants that will lead them to rethink their purposes and procedures; that will encourage in them a more critical attitude toward their work; and through contact with library school students necessitate a rational justification for their methods and services,
3. Add to the staff the services of a library school student at about half the salary of a library school graduate. The difference in preparation between an intern and a library school graduate is one three-hour course--the thesis.

For the Library School

1. Improve the education of future librarians, broaden their horizons, and facilitate their entry into professional responsibility.
2. Bring the faculty closer to present-day libraries and library problems there by making their interpretations more alert, their teaching more cogent, and their research more vital.
3. Provide a more immediate and more certain check on the teaching now being done in the library school-on its scope, its quality, and its practicality.

Proposal to impart training

The internship may be implemented by any graduate library school. A report or thesis is to be written by the student based on his intern experience. The prospective intern is presumed to be the holder of a bachelor's degree, and before the internship begins, will have completed all course work for the master's degree except the three-hour thesis. Short term courses can also be offered to the students of LIS to make them aware of practical work. The students of diploma, run by Technical Education, get chance to do four months' training before completion of diploma and after completion - apprenticeship for one year and they get stipend for the same. In the course of one year they are trained enough to handle various activities of library. The same practice may be started for graduate and post graduate students of Library Science to develop professional skills among them.

Conclusion

Some of the library schools have started two years Master's degree course in library science to impart practical experience in the field to the students. The profession will get better professionals only when the internship idea has been widely accepted and put into operation for a large number of library school graduates each year by all the library schools. A large number of interns would necessitate some degree of regulation and uniformity in the selection of libraries and in the selection of students for the internships. Only Indian Library Association is in a position to bring about such uniformity.

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Significance of Library in Human Resources Development in Academic Industry: *A Study Based on Educational Institutes of Bhiwani - Haryana*

Narender Kumar **Sudhir Kumar** **Sudhir Narayan Singh**



In the present era libraries have been taken new shape like digital library, electronic library, virtual library, hybrid library and the same are being concerned as the heart of organization. Human resources are also known to be the heart of any organization. In the age of information and communication technology, public sector and private sector have been focusing and paying more to meet the challenges of an open market. This paper will try to elicit the significance of library in Human Resources Development in academic industry. Many organizations consider their human resource as human capital as Human Resource is to develop the balancing act in the growth of business. The Human Resource works like a catalyst in the organization.



Library, Information Technology, Human Resources, E-Resources

1. Introduction

Since the very dawn of Human Civilization, man has inquisitively been engrossed in the eternal quest of knowledge and learning. Whatsoever he thought valuable and of timeless significance he tried to pass on to the next generations. Human beings' this quest resulted in the form of books and the repository of traditionally inherited knowledge took the form of Library where the knowledge-seekers may satiate their hunger and quench their thrust by the thoughts of wisdom flowing unhindered till date. Twenty first century education system was revolutionized by the advent of Information and Communication Technology and so library couldn't remain untouched. It also took a new shape and came up in a new form to cater to the need of a new century.

2. Review of Literature

Adiniji M.A. et. al (2012) Discussed the most important and valuable resources in Nigerian Higher Institutions are the Human Resources. The quality or level of knowledge and skills the Human Resources are having in Nigeria play a very significant role in the success or failure of the organization in various citadels of learning. National Library Kolkata (2010) Illustrated that the objectives of the Policy on Human Resources Development that the purpose of the policy is to state in broad terms the commitment of the National Library, Government of India, Kolkata, to staff development and to training others who are not employees of the Library in skills pertaining to various aspects of library and information management in India. The policy also aims at indicating the roles that different parties play in the delivery of such training, particularly the Training and Human Resource Development division of the National Library.

Fitzgibbons, Magan Anne (2008) This paper focuses on the implementation of an information commons in an academic library has a significant impact on human resource concerns in the organization. The success of the project relies on the application of change management strategies. The abilities and roles of staff members must be assessed and reshaped to create the integrated service model.[7] Saha N. C. and Dass M. K. (2006) This paper addresses that through the systematic and organized training and development programmes capabilities and productive potentialities of human resources can be enhanced easily. It increases the capabilities of people through appropriate mechanism such as education, training, counseling, career planning, performance appraisal or self appraisals, awards or rewards etc. among all these, education and training play a vital role in strengthening both academic and professional capabilities of human resource to meet the goals of an organizations. Devi A. H. and Devi Purnima (2006) Investigates the development of

human resources fully depend upon the core of knowledge productive organizations like libraries. In this fast changing scenario the library and information workers are required to possess enhanced managerial, professional and technical skills, adequate knowledge and right kind of experience. So, training for the existing manpower or recruiting new professionals will become essential. Further, the libraries need to be upgraded along with the changing environment from its traditional to a digital environment.[9] Hawthorone Pat (2004) Mentioned that like library the changes take place in human resource profession also due to shifting of workforce, technology, increasing competition, globalization, demographic changes and redesigning of human resources functions.[10] Alani (1993) Explain that the libraries play an important role in Nigerian education; the main function of an academic library is to provide materials for teaching and research for members of the academic community. Library buildings and large collections without skill professionals pass only as glorified warehouses.

3. Objectives of the study

- To empower human resource in academic industries.
- To focus the periodical training needs.
- To develop the relevant and need based training materials.
- To focus Library as the repository of training materials.
- To enhance the frequency of library visits by the professionals of academic industries for the positive outcomes.
- To authenticate library as the better place for valid information than that of Internet.
- To enhance the readership habit.

4. Research methodology

To conduct this study questionnaire was prepared and used as a tool for data collection. 150 questionnaires were distributed to different professionals and academicians imparting their services in various schools, colleges and institutes. However, only 110 questionnaires are received in filled form for data analysis. For data analysis SPSS-Software was used and the findings were interpreted and narrated as per the results obtained.

5. Limitations of the Study

- Attitude of the respondents towards the questionnaire.
- Time limit with the respondents.
- Interpretations of questions by the respondents.
- Small Sample Size i.e. 150 distributed and received 110 only.
- In general, the study can be applicable only to the human resources functional in the academic areas; and in particular, to the academic institutes functional in Bhiwani- Haryana.

6. Data Analysis

Note: Numbers mentioned i.e. 1, 2, 3, 4, 5, under the base line of every chart denote the options of responses i.e. 1 = Strongly Disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly Agree. And the numbers i.e. 0-100 mentioned on the vertical line denote the percentage of respondents.

Table 1-In the continuous changing scenario enhancement of knowledge of all human resources is an inevitable need

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	4.5	4.5	4.5
	Somewhat Disagree	10	9.1	9.1	13.6
	Nether Agree nor Disagree	10	9.1	9.1	22.7
	Somewhat Agree	20	18.2	18.2	40.9
	Strongly Agree	65	59.1	59.1	100.0
	Total	110	100.0	100.0	

As shown in the above chart more than 60 percent respondents have strongly agreed that for enhancement of knowledge of human resources is an inevitable as the knowledge is the base of confidence of every person working in any field and the confident persons can only be successful.

Table 2- For enhancement of knowledge and skills periodical training is necessary

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.9	.9	.9
	Somewhat Disagree	7	6.4	6.4	7.3
	Nether Agree nor Disagree	12	10.9	10.9	18.2
	Somewhat Agree	20	18.2	18.2	36.4
	Strongly Agree	70	63.6	63.6	100.0
	Total	110	100.0	100.0	

About 70 percent respondents have strongly agreed that training is necessary for enhancement of knowledge and skill because through regular training programmes only the skill enhancement can be made possible.

Table 3- For imparting the training to human resources availability of relevant literature and study material is inevitable

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	3.6	3.6	3.6
	Somewhat Disagree	9	8.2	8.2	11.8
	Nether Agree nor Disagree	16	14.5	14.5	26.4
	Somewhat Agree	33	30.0	30.0	56.4
	Strongly Agree	48	43.6	43.6	100.0
	Total	110	100.0	100.0	

As shown in the above chart about 50 percent respondents have strongly agreed and more than 30 percent have responded to the option agreed that for imparting the training relevant study material is necessary. In absence of the same none can give the education and training to anybody.

Table 4-For providing relevant literature for training and development the library becomes the unavoidable requirement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	4.5	4.5	4.5
	Somewhat Disagree	8	7.3	7.3	11.8
	Nether Agree nor Disagree	11	10.0	10.0	21.8
	Somewhat Agree	36	32.7	32.7	54.5
	Strongly Agree	50	45.5	45.5	100.0
	Total	110	100.0	100.0	

More than 50 percent respondents strongly agreed and about 40 percent have agreed that the Library is an unavoidable requirement for providing relevant literature for training because the Library is the only place where one can get the authentic and appropriate literature of concerned field.

Table 5 - Training and development of people is possible without the help of library

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	27	24.5	24.5	24.5
	Somewhat Disagree	16	14.5	14.5	39.1
	Nether Agree nor Disagree	12	10.9	10.9	50.0
	Somewhat Agree	29	26.4	26.4	76.4
	Strongly Agree	26	23.6	23.6	100.0
	Total	110	100.0	100.0	

Responses of the respondents vary that on the above statement given in chart No.5 some are strongly disagreed, similar number of respondents have agreed also. The reason of this kind of varied response is that some of the respondents either could not understand the question or did not read the question carefully.

Table 6- Whenever you need to know a matter/ issue which is not known to you, you always go to library

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	11	10.0	10.0	10.0
	Somewhat Disagree	9	8.2	8.2	18.2
	Nether Agree nor Disagree	12	10.9	10.9	29.1
	Somewhat Agree	43	39.1	39.1	68.2
	Strongly Agree	35	31.8	31.8	100.0
	Total	110	100.0	100.0	

About 45 percent respondents have strongly agreed and more than 35 percent have agreed to the fact that when they want to know about any issue/ matter they visit to library where they get the information. It proves that the library is the only place where people get required information and enhance their knowledge.

Table 7- Library is the only place where one can get all desired information

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	8.2	8.2	8.2
	Somewhat Disagree	21	19.1	19.1	27.3
	Nether Agree nor Disagree	16	14.5	14.5	41.8
	Somewhat Agree	37	33.6	33.6	75.5
	Strongly Agree	27	24.5	24.5	100.0
	Total	110	100.0	100.0	

About 40 percent of respondents have agreed and about 30 percent strongly agreed that the Library is the only place where one can get desired/ required information. It is also proving the significance of Library for development of Human Resources by providing them all necessary information.

Table 8 - Although some people use internet to get information yet library is better source of information than the internet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	4.5	4.5	4.5
	Somewhat Disagree	15	13.6	13.6	18.2
	Nether Agree nor Disagree	25	22.7	22.7	40.9
	Somewhat Agree	31	28.2	28.2	69.1
	Strongly Agree	34	30.9	30.9	100.0
	Total	110	100.0	100.0	

More than 35 percent respondents have strongly agreed, about 33 percent agreed and more than 25 percent have neither agree nor disagree to the statement that Library is better source of information than internet. The reason of being strongly agrees and agrees of the respondents because physical Library is still easier to access in India than the internet.

Table 9- Every organization should have library

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	6.4	6.4	6.4
	Somewhat Disagree	5	4.5	4.5	10.9
	Nether Agree nor Disagree	8	7.3	7.3	18.2
	Somewhat Agree	30	27.3	27.3	45.5
	Strongly Agree	60	54.5	54.5	100.0
	Total	110	100.0	100.0	

60 percent of total respondents have strongly agreed and about 30 percent have agreed that every organization must have a Library. It proves that the Library has a vital role to play in the development of Human Resources of every organization.

Tables 10-The employees of those organizations are more learned where library facility is available

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	4.5	4.5	4.5
	Somewhat Disagree	6	5.5	5.5	10.0
	Nether Agree nor Disagree	21	19.1	19.1	29.1
	Somewhat Agree	38	34.5	34.5	63.6
	Strongly Agree	40	36.4	36.4	100.0
	Total	110	100.0	100.0	

Approximately 40 percent respondents have strongly agreed and approximately 40 percent have responded to the option agreed that the people who have facility of Library at their work place are more learned than those who do not have Library facility at their workplace. It proves that the library is inevitable need for Human Resources Development of every organization.

7. Suggestions and Recommendation:

- Awareness campaign is required regularly with regards to Library facility for the concerned users.
- Each academic industry whether school, college, institute, and university must offer library services to their users and without it their existence cannot contribute to the progressive need of the Gen Z.
- Orientation programs must be started by each library because this is the only media through which every library can explore itself and upgrade their services.
- Libraries must opt for open access method especially libraries of the technical institutions can adopt this method for their users and make their library easily accessible.
- In the changing scenario and with the emergence of latest technologies every library must keep open their doors for adopting the latest technologies and recruit skilled manpower and make some provision of training for existing manpower to cope up with latest technologies.
- Although libraries have been subscribing e-resources for their users but due to non availability of the proper IT infrastructure and trained manpower they are not able to provide the services of these resources because the usages of e-contents are totally depend upon the library professionals.
- Human resources are being considered as human capital so their potential in respect to performance is totally depend upon their knowledge level and for enhancing the knowledge library facility must be provided to human resources.
- From the olden days library role in the development of civilized society can easily be measured even it has been proved from many studies that libraries played prominent role in changing the history of the world.
- Library and Human Resource relations are just like pestle and mortar because decisions are always taken by the human beings, and library and its material had played in great role in effective decision making. Henceforth, library has the inevitable place in the life of human beings.
- Library, must always, analyze the data of bonafide users about their visit and usage of library if any user is not visiting the library regularly, library authorities try to find the reasons and give orientation to the concerned user and tell about the benefits of the library.

8. Conclusion

In a nutshell, library is the place where every human being tries to become the think tank due to positive vibrations and availability of study material. Library and Human Resources are the part of a coin because knowledge exists inside the library and knowledge is the result of human thoughts, human needs, and human urge and so qualified human resources who are supposed to contribute to the academic cause cannot be divorced from library. Hence, knowledge is the source of wisdom and wisdom helps in taking the better and situational decisions and equips with problem solving skills for the benefit of the civilized society.

However, to make accessible all relevant materials for bonafide users library adopts all methods. For the training library pivotal role as required study materials are existed in the library. Training is also necessary for the development of the human resources because the technology is changing at very fast pace and day by day new technologies are emerging so to cope up with these technologies training is essential. Going for the 'scientific based training need analysis' is the ailing challenge and to meet with the emergence of this concern a qualified, eligible and efficient team of professionals cannot be groomed in absentia of a highly up dated library infrastructure. Last, but not the least library must exist at every working place. It won't be an exaggeration library is responsible to change the intellectual breed of human beings.

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Soft Skills for LIS Professionals

Mandgaonkar, K O



This paper discusses the concept of soft skills, its importance, need, attributes, categories, top soft skills and competencies for LIS professionals and also suggests that soft Skills trainee.



Soft Skills, Soft Skills attributes, Compentancing for LIS

1. Introduction

Technical and job-related skills are a must, but they are not sufficient when it comes to finding a job or processing up the ladder. With traditional style of leadership becoming out of fashion professional mangers expect their employees to have something extra which we call today, soft skills. A knowledge society is one where creating, sharing and using knowledge could influence the prosperity and well-being of the people directly. It is a Work-in-Progress" Society that invest significantly in harnessing the available skills, technology and learning towards development. The traditional nation of 'Knowledge for its own sake' has today given place to the modern idea 'Knowledge is for Development'. Revolution in information communication technology will galvanize the process of Knowledge communication. Access to information and Knowledge will therefore assume a different dimension altogether.

2. What are Soft Skills

Soft Skills are essentially people skills the non technical intangible, personality specific skills that determination one's strengths as a leader, listener, negotiator and conflict mediator.

Soft skills is a term which refers to personality, traits, Social graces, facility with language, personal habits, friendliness, and optimism that nark people to varying degrees.

Soft skills are the secret weapon in job hunt; soft skills refer to skills needed in the daily interaction with others. It governance our behavior at meeting, towards colleagues, on the phone and the way we approach problems. These skills are not easily measurable. They stand in contrast to technical skills.

3. Important of Soft Skills

Soft Skills play a significant role in one's success in life particularly in one's profession. They help one to excel in the workshop and their importance cannot be denied in this age of information and knowledge. Soft Skills in the highly competitive corporate world will help any one stand out in a crowd of regular job seekers with ordinary skills and talent. The job seekers are expected to have what employers call soft skills. The ever-chaing impact of information technology and the style of management pay so much attention to soft skills.

Soft Skills play an important part for the success of an organization. Organizations particularly those dealing with customers face-to-face are generally more prosperous if train their employees to use soft skills. Soft Skills have become absolutely essential for the success of the organizations and the individuals. Soft Skills are as important as traditional hard skills to an employer regardless of industry or job type. It is also to be understood clearly that soft skills complement hard skills. At the same time hard skills cannot be replaced with soft skills. Soft Skills are very important in business. It is essential to be technically sound, but one should also have the ability to convey the idea to the masses in the simplest possible manner. "Planner is necessary but executing is also equally important. And it takes soft skills to execute any idea because it involves dealing with people directly".

For this reason, soft skills are increasingly sought out by employers in addition to standard qualification.

4. Attributes regarded as Soft Skills

In addition to key competencies like strong analytical skills, reasoning skills and a proven ability to manage complex information that employers are looking for desirable soft skills which include.

- **Interpersonal Skills:** These include the ability to lead motive and delegate. They are important at every level of organizational responsibility and should always be evident.
- **Team Working:** Today world is driven by innovation leading to constant change and success of an organization depends on its teams. Team building is one of the crucial areas in which the employees need to be trained.
- **Negotiation Skills:** Negotiating in a way means we are able to achieve decided out comes and still maintain successful ongoing relationship will help you achieve more of what you want and build relationship based on openness, trust, understanding and mauled respect.
- **Communication Skills:** The ability to communicate ideas to others effectively is an absolutely essential requirement for technical; Engineering and IT professional, as the nature of the industries make them depend upon shared knowledge.
- **Stress Management:** Stress is the world that many people use when they are describing how the demands of their life seems to be becoming too great for them to cope with. This ability to cope with stress various from individual. Our success in a job depends on our ability to handle work pressure.

5. Soft Skills are also categories in the following manner. They are:

- Communication Skills
- Interpersonal Skills
- Positive Attitude
- Values
- Perception
- Etiquette
- Problem Solving
- Coping with time
- Coping with tress
- Coping with emotions
- Team work

Top 60 Soft Skills

- Math's
- Safety
- Courtesy
- Honesty
- Grammar
- Reliability
- Flexibility
- Team skills
- Eye contact
- Cooperation
- Adaptability
- Follow rules

- Self-directed
- Good attitude
- Writing skills
- Driving license
- Dependability
- Advance math's
- Self-supervising
- Good references
- Being drug free
- Good attendance
- Personal energy
- Work experience
- Ability to measure
- Personal integrity
- Good work history
- Positive work ethics
- Interpersonal skills
- Motivational skills
- Valuing education
- Personal chemistry
- Willingness to learn
- Common sense
- Critical Thinking skills
- Knowledge of fractions
- Reporting to work on time
- Use of rulers and calculators
- Good personal appearance
- Wanting to do good job
- Basic spelling and grammar
- Reading and Comprehension
- Ability to follow regulations
- Willingness to be accountable
- Ability to fill out a job application
- Ability to make production quotas
- Basic manufacturing skills training
- Awareness of how business works
- Staying on the job until it finished
- Ability to read and follow instructions
- Willingness to work second and third shifts
- Caring about seeing the company succeed
- Understanding what the world is all about
- Ability to listen and document what you have heard
- Commitment to continued training and learning
- Willingness to take instruction and responsibility
- Ability to relate coworkers in a close environment
- Not expecting to become a supervisor in the first six months
- Willingness to be a good worker and go beyond traditional eight hour day
- Communication skills with public, fellow employees, supervisors and customers.

6. Competencies of LIS Professionals

Competencies are the skills, knowledge and personal attributes that enable individual to contribute positively to their organizations and library profession. The competencies apply to all librarians.

- Recognizes and address the diverse nature of the library and, if applicable, its parent institution.
- Demonstrates a strong commitment to excellent user service
- Demonstrates knowledge of the library system and the library profession.
- Understands knowledge of library and information science theory, information creation, organization and delivery.
- Adheres to the Code of Ethics.
- Demonstrates commitment to working others to achieve common goals.
- Acts within the organization to implement the principles of knowledge management.
- Monitors and implements changes in technology and information systems.
- Shares knowledge and expertise with users and colleagues.
- Display excellent communication skills and is able to promote the library and advocate for its needs.
- Communicates effectively with publishers and other information providers to advance the interest of the library.

7. Soft Skills Training

Soft skills being internal and innate they can be acquired by constant practice. For constant practices soft skills training are essential because we do not have it in our academic curricula. Soft skills can be enhanced simply by being aware of oneself and living.
Training in soft skills entails the following competencies:

- Effective Listening.
- Identify leadership styles.
- Developing the spirituality of leadership.
- Identifying winning attitudes.
- Learning to be more flexible.
- Manage stress.
- Developing honesty, kindness and ethical behavior.
- Learning the skill of educating, motivating and activating.
- Skill of being authentic.
- Interpersonal skills.
- Conflict resolution.
- Problem solving.
- Trust.
- Encouraging the heart in the workplace.

8. Conclusion

Today knowledge and information are blending the people and many are earning their living acquiring and transferring knowledge or processing and handling information in one way or the other. It is seen that the dependence on knowledge and information is heavily increasing in the days to come. In the knowledge society knowledge is power. People and organizations have realized the true value of information and knowledge per see are succeeding today. However working in the knowledge environment is not an easy task. Knowledge resides in human brains, in individuals, in communities of interest in relationship between

individual communities. Knowledge has a dynamic structure, which is constantly undergoing change by the thinking and learning process. The two qualities inherent to all of the above mentioned requirements of LIS professionals, i.e. their essential soft skills, are the notion of holistic, situational problem solving, and willingness to continuously revise one's own sense of meaning. Although it is hard to list or document everything exactly, a successful Information/Library professionals needs to have a lot of important soft skills. Without possessing or acquiring them the LIS professional will not be able to fulfill his role in any Information centre unless you have the soft skills, you can't get the hard skills.

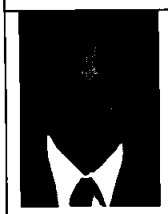
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Soft Skills for Library Professionals and the role of curriculum

Pallavi Gogoi



The traditional image of libraries and LIS professionals is rapidly changing and widening into a knowledge center and a knowledge manager respectively. To cope with the changing environment along with the technological skills LIS Professionals must have the soft skills. Soft skills are the personal qualities which all the library professionals of present day society must develop to achieve greater success in their profession. The LIS curriculum has a serious responsibility to incorporate issues towards developing soft skills among the students. The paper deals with some important soft skills for the library professionals and the role of curriculum in developing soft skills in LIS graduates. A study has been conducted to identify the level of soft skills available among working professionals of Assam and the study also finds out how far the professionals are benefitted from the curriculum in developing soft skills in them.



Soft Skills, LIS Professionals, LIS Curriculum.

1. Introduction

Library profession is no more limited to its traditional set -up. With the technologies getting entrants into the field, LIS profession is now compared with high level technical professions and at the same time the professionals are also required to develop certain qualities in them to secure its position in this rapidly changing IT society. With the changing society, LIS curriculum is also changing to incorporate lots of IT issues to make the professionals competent to work in the present environment. Along with the technical skills , this is the high time when the professionals need to develop soft skills as an added advantage to step ahead in the competitive job market.

2. Soft skills for librarians

Today' s librarians must have the ability to work in hybrid environment with the knowledge of both traditional , digital and even virtual environment. To meet the requirements of different job environments, to play varieties of responsibilities of managers, administrator or technical assistants, the librarians must possess lots of qualities and simply having a degree in library and Information science is not enough for them. The society demands librarians with multidimensional aptitude to work at technical or administrative level or to provide satisfactory user services with necessary soft skills.

In a recent survey of recruiters from companies with more than 50,000 employees, communication skills were cited as the single more important decisive factor in choosing managers. The survey, conducted by the University of Pittsburgh's Katz Business School(2007), points out that communication skills, including written and oral presentations, as well as an ability to work with others, are the main factor contributing to job success.

Effective communication is an important category of soft skills. Importance of communication skills can never be ignored or neglected. These skills are the key to execute good management skills. Good communication involves a set of complex skills. Interaction with patrons, researchers and community members is the life blood of libraries. If a librarian lack skills to listen to what they are looking for, as well as the skills needed to convey the information back to them in a way that is beneficial for them, that librarian would be ineffective. Above all good communication skill can improve the image of the library profession in

the society; it brings trust and cooperation from the user's side which is very much necessary for the profession for its success in proper sense

Management skill-as the librarians are the manager of a library and information centre, they should have some basic managerial skills for managing the different sections like Finance, Human Resource etc. They should have to apply some of these managerial skills in planning, decision-making, motivating etc. Time management skill is one of the important managerial skills required for a successful librarian. Another aspect of management is change management which is also an important skill to be developed by modern librarians.

Marketing of Library Services is gaining importance day by day in the shrinking economic condition of the libraries. Some of the attributes of marketing which directly depend upon good communication skill of the professional for its success are as follows:

- a belief in service and trying to achieve customer's satisfaction;
- a clear understanding of their organization's overall aims and objectives;
- an ability to assemble and interpret information for the benefit of the customer;
- good communication skills, both oral and written to communicate with the customer.

These attributes are very much desired for the successful information service providers. Thus, skills, attitude and judgment of the service providers are important while marketing in library and information services.

Decision making and problem solving skills need to developed through the qualities like flexibility and creativity. Self management and attitude is a part of personal skills , which includes self awareness, self confidence, positive attitude, initiative along with concern for the others, which is again very much important for developing interpersonal skills. Interpersonal skills-Librarians have to deal with all levels of people like Management, users, colleagues in library, vendors etc. To deal with each one of them in rightful manner interpersonal skills are required. Interpersonal skills include assertiveness skills, listening skills, conflict resolution skills and problem solving skills etc.

Leadership skills & Teamwork- Library management especially the big library is a team exercise. Hence it is required to have leadership skills to manage and guiding the team time to time, as every subordinate is important for carrying out their work efficiently for smooth running of library. Negotiating skills-These skills are required on special occasions such as handling bulk purchases, specialized databases subscription with vendors etc. Also some times in delicate situations like library committee meetings or avoiding undue requirements from arrogant users etc.

Presentation skills- The presentation skills are required at different stages of library management; May it be in the library committee meetings, while preparing a report or proposal and even in daily work which represents the library management overall for users. It not only emphasizes the individual skill but also from library organization point of view, by means of its decoration, users guides, and library ambience.

Creativity and analytical skills are seen as equally important skills. They should have the analytical skills as to be able to capture and analyse information related to the organisation operations and goals. They should have logical and thoughtful thinking, be resourceful and should have a macro view of the entire organisation. They should know how to draw, capture and share related information.

Sensitivity, understanding, Proper Judgement, Personal Appearance, Good manners, Positive attitude, Self confidence, Initiative, concern for others- these are some self management skills or we can call them

personal traits which must also be present in a professional to get success in a profession dealing with people , customers, or users.

3. Soft Skills through Curriculum

While most of the skills and competencies of LIS professionals appear to be sufficient to work in different capacities, but the soft skills in general, and social and entrepreneurial skills in particular are very important to work in today's knowledge based economy. Therefore, in addition to include more courses on knowledge management and information technology, LIS programs will have to systematically impart soft skills to their graduates.

As LIS curricula is becoming more flexible and choice-based, LIS schools are experiencing need for specialized faculty from areas such as management, information technology, psychology, media studies, etc. The emerging trend that favours LIS schools is to employ faculty having qualifications in library and information science and an additional degree in some cognate area such as information technology, management, psychology, etc. (Singh & Malhan, 2010).

Besides technical knowledge, soft skills also play crucial role in an individual's performance at work place. In addition to lack of soft skills, a gap exists between what the LIS professional can do and the expectations and perceptions of information user seekers. The profession need more extrovert people who can develop better rapport with the patrons/users of the library. Group discussions can make them more open and confident. Therefore innovative teaching methods must be used to involve students in the process of teaching and learning.

While selecting students for the course along with their academic qualifications, other qualities like their communication skills, listening skills, extrovert personality, creativity, ability to work in team, time management etc qualities should also be considered.

As it is a universally accepted fact that the LIS courses receive majority of mediocre students, therefore it increases the responsibility of the LIS educators to equip them with all the necessary knowledge and skills , so that they come out as a powerful human resource to serve the society. Manpower development should be an integral part of the activities of LIS departments.

No matter how technological the profession becomes, library profession is still a service profession and even those who do not interact much with the public still must maintain excellent relationships within the organization, with the higher authority and staff. The interpersonal and leadership skills must get a good place in the curriculum. Management is almost always a required course, and elements of this course frequently emphasize human relation skills.

Leadership is not just a matter of learning better presentation or listening skills, or being a visionary, although these skills are extremely important. To really change and develop leadership potential one must first understand who are they, and begin an ongoing process of honestly examining their reactions to life situations, learning from mistakes, and practicing behaviors that are congruent with natural preferences. Thus it is possible for anyone through reading and study to develop leadership skills, but a course in graduate/professional education would be most beneficial because it could combine with and relate to the practice of librarianship.

Soft skills are personal attributes that shine during personal interaction. These can be modified and developed to certain level, but it's difficult to completely change in a person. While LIS schools should definitely let students know the importance of soft skills, it will be internships and work study programs that LIS schools should require that will give someone the best opportunities to enhance their soft skills in real world scenarios.

4. Result of survey on Library professionals

A survey has been conducted among Library professionals of Assam to gather information regarding soft skills possessed by them and to know the impact of curriculum in developing soft skills on them. For the purpose a total of 35 library professionals both from the colleges and universities of Assam were selected on convenience basis. The professionals were selected who were graduated in the field of LIS within last ten years to ensure that they are aware of various skills and competency requirements of present day library professionals.

A questionnaire was designed to collect information on some of the soft skills possessed by the existing professionals and also to find out soft skills learned and developed through curriculum. To know about the skills possessed by them some indirect questions were put on the questionnaire and the author analysed them to take out information as per the requirement of the paper. Personal interaction with some of the professionals also helped to collect some relevant information. The results of the survey is presented below:

Table1: Personal qualities of Library professionals(n=35)

Personality traits	Good(3)	Very Good(4)	Fair(2)	Unsatis-factory(1)
Concern for others	10	-	25	-
Flexibility	-	10	15	10
Initiative	10	10	05	10
Judgement	10	05	10	10
Manners	10	10	05	10
Motivation	20	-	10	05
Personal Appearance	15	-	20	-
Positive Attitude	05	10	15	05
Teamwork	05	05	20	05
Timeliness	10	05	20	05

Some situations were mentioned in the questionnaire and the respondents were asked to tick against the situation which suits them most. Some scores were given against each situation which determines good, very good, fair or unsatisfactory personal quality of the respondent. The highest score is 40 and the lowest score is 10. The above table shows the number of respondents scoring a particular score against their personal traits. The analysis of the responses shows that only 31.43% of respondents score more than 30 and 54.28 % of respondents score just above 50% score, i.e. more than 20 and rest 14.29 scores below 20.

Personality traits are ingrained qualities and difficult to change within a short period of study of a particular course, but some of the these skills can definitely be improved through proper development in the curriculum, with emphasis on students understanding about the importance of soft skills in their professional life and how to practice them towards improvement in behaviour and attitude.

Table 2: Soft Skills learned through curriculum (n=35)

Soft Skills	To some extent	To large extent	Not at all
Communication skills	19	12	04
Creativity	18	08	09
Influencing skills	09	02	24
Interpersonal skills	10	06	19
Leadership skills	22	05	08
Management skills	24	11	-
Presentation skills	22	13	-
Team work	14	08	13
User services	10	25	-

The above table shows, what practicing library professionals feel about the influence of curriculum in developing soft skills on them. It is seen that maximum professionals are benefitted by the curriculum in developing their user services skills. Next the curriculum helped in developing communication skills, and Management skills. Influencing skills, interpersonal skills, and teamwork skills are not getting much attention in the curriculum as responded by the practicing librarians. Except user services none of the other skills are getting majority response from the respondents. It results that, there is lots of scope for the educators to consider different issues in the curriculum for soft skills development among the library professionals.

Practicing librarians are the best persons to consult about the inclusion of practical issues in the curriculum. The various suggestions made by the respondents involves recommendations for inclusion of issues like conflict management, stress management, decision making, problem solving along with more emphasis on practical aspects of different IT skills.

5. How to improve soft skills

Soft skills cannot necessarily be taught as class content, but may be developed alongside other skills or as a result of assignments, class activities, practices etc. A course curriculum can be designed to enhance soft skills among the students and future professionals having components such as: Introduction to soft skills, importance of soft skills for the professionals soft skills vs. hard skills etc. Students should be given assignments which would involve their creativity and thinking. Group discussions and class seminars on regular basis would also help them to open up. Existing course contents which generally form part of various course curriculum, like management, user studies, human behaviour, communication etc. should be thought with more emphasis on practical aspects.

Projects can be assigned in groups, with individual responsibility to each member; so that they learn how to work as a team and a member of the team acts as a manager and provides leadership and direction to the group. Some reward to the best team would ensure motivation on the part of the students as well as creativity and it would help them to develop presentation skills also, as the reward would also depend upon the good presentation of their work. Role playing, case studies can help them to relate theory with practical life , thereby students can learn particular behaviour through acting in a particular situation or from real life situations.

Projective techniques can be used to identify some hidden traits of the students. Practice of projective techniques would also help in developing their creativity and analytical quality. "Soft skills" can be taught/developed/encouraged in already existing library courses if instructors are willing to make the effort to integrate soft skill-related learning objectives into their class activities.

6. Conclusion

The library professionals of today should cease to think and behave traditionally.. Their behaviour towards their job, their responsibilities should reflect professionalism. To live dignified and satisfied life good skills must be developed. This is the time when the professionals need to change their conduct their attitude towards the work. They must develop proper ways to interact and communicate with the people which would help to develop proper image of the profession in the society. Having the soft skills here would be an added advantage. Though masters courses on LIS represent the areas of professional competencies but there are very few areas of Soft skills which get a place in the curriculum. Development of human resources in terms of soft skills depends more upon competent faculty and their willingness. Soft skills would definitely help the professionals to stay ahead among the job seekers in this competitive world.

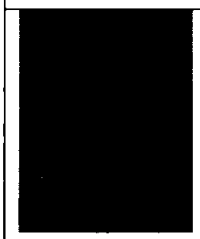
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Soft skills in Librarians Working in Academic Institutions of Higher Education with Special Reference to Amravati City in Maharashtra

Supriya A. Bejalwar

Abstract

Library is a service oriented institution where services are offered to the users by Librarian. Hence the performance of Librarian affects the overall performance of Library. Basic skills which affect the performance level of Librarian are classified as hard skills and soft Skills. The present study concentrates exclusively on soft skill performance of Librarians and efforts are taken to measure the soft skill performance of Librarians at their work place. For extending the proper and effective services to his/her user Librarian has to manage the other things of the library such as collection development, housekeeping jobs and administration.

Higher education, Soft skills, Academic library, LIS professionals, Amaravti, Maharashtra

1. Introduction

Skills are goal-directed, well organized behaviors acquired through practice and performed with economy of effort (Proctor & Dutta, 1995). At work place an employee is required to have skills some of which are essentials and some of which are desirable. According to Katz (1974) skills required by effective managers can be classified in three categories: i.e.: technical, human & conceptual. Technical skills are detail oriented skills which vary from profession to profession. Human skills are those interpersonal skills needed in order to manage a group of people or interact in a one-on-one format. Conceptual skills are planning and visioning skills needed by managers. Sandwith (1993) identified five competencies domains for management training: Conceptual/creative, Leadership, Interpersonal, Administrative and Technical. Based on above categories we can classify the skills required for any profession into two categories: Hard skills & Soft skills. Hard skills correspond to the skills in the technical and administrative categories and Soft skills correspond to the skills in the human conceptual, leadership and interpersonal categories.

There are many definitions for Soft Skills which vary from profession to profession. Some of the noteworthy definitions are discussed here. According to "Investopedia" soft skills is "The character traits and Interpersonal skills that characterize a person's relationships with other people." In the workplace soft skills are considered as a compliment to hard skills, which refer to a person's knowledge and occupational skills. Sociologists may use the term soft skills to describe a person's Emotional Intelligence Quotient. In Oxford English Dictionary it is given that "Soft skill is personal attribute that enable someone to interact effectively and harmoniously with other people." According to CIPD Research Report(2010) "Soft skills are experientially acquired self, people and task related behaviors that complement the use of 'hard' technical knowledge and skills in the workplace and enable individuals to navigate successfully the requirements, challenges and opportunities of their role in pursuit of personal, team or organizational goals". Whitmore and Fry (1974) defined soft skills as important job related skills that involve little or no interaction with machines and whose application on the job is quite generalized. According to Giloth (2000) "soft skills are skills related to critical thinking, oral communication, personal qualities and interpersonal and/or teamwork.... Many of these skills are shaped by structural changes in the economy, technology and new form of work organization." According to Kantrowitz (2005), soft skills are "intra-inter personal work skills that facilitate the application of technical skills and knowledge."

There are many terms associated with soft skills like 'Multiple intelligences', 'Practical intelligence", Emotional intelligence, Soft Attitudes, Social intelligence, Ecological intelligence, Spiritual intelligence. Practical intelligence is based on 'street smarts' (i.e. creating 'best fit' with your environment) and tacit knowledge (i.e. knowledge usually not openly expressed) acquired not in the classroom (as book smarts) but in 'learning by doing' and is one of the hallmark of 'managerial success' (Wagner and Sternberg, 1987). Other

terms associated with soft skills were Emotional Intelligence and Intuitive intelligence. Coates (2006) associates soft skill with People skill and includes Communicating, listening, feedback, cooperating engaging in dialogue, giving feedback, cooperating a team member, solving problems, contributing in meetings and resolving conflict in Soft skills. Where in, Social competencies, Social skills and Personal competencies are considered as elements of Emotional Intelligence by Poskey (2011). Reigeluth (1999) identified Generic skill as skill which can be applied across a variety of subject domains and takes longer to acquire than domain-independent/subject areas skills.

2. Attributes and Categories of Soft Skills:

According to Boyzatis (1982) and Stevens and Campion (1994) four categories of soft skills can be identified: 1) Leadership/people/relationship skills 2) Communication skills 3) Management Organization skills 4) Cognitive skills and knowledge. Kantrowitz (2005) identified total 107 attributes and they were grouped into seven categories for soft skills: 1) Communication / persuasion skills 2) Performance management skills 3) Self-management skills 4) Interpersonal skills 5) Leadership/organization skills 6) Political/Cultural skills 7) Counterproductive skills.

This study uses attributes mentioned in both the above mentioned studies to assess soft skill performance of Librarians.

Every profession requires hard skills and soft skills. At workplace technical, scientific and professional hard skills by themselves are necessary but insufficient for effective performance. Hard skills need to be supplemented by non-technical, job related skills in order that the hard skills can be applied effectively (CIPD Research Report, 2010). It can be applied in various professions such as Accounting, Law, Information Technology, Engineering, Project management.

From these discussions we may summarize that every service oriented profession requires hard skills complemented with soft skills. Success in any profession cannot be achieved without both of these skills. Library profession is not exception to it. Being a service oriented enterprise professional working in the library requires soft skills. Keeping in mind that most of the services in the library are people oriented whether it is interacting with colleagues or users, or providing services to users, soft skills play a major role in affecting the quality of services.

In the present study it is assumed that Librarians possess hard skills (Technical skills) required to run the library effectively and smoothly and hence the focus of this study is only on soft skills at their work place that i.e. Library. Many eminent personalities have studied application of soft skill in various professions. These studies are discussed in short in forthcoming paragraph. Ahmed Faheem (2011) analysed 124 advertised jobs in the title of software architect and explored the soft skills requirements. Penzenstadler (et al.) (2009) discussed characteristic of soft skill required for engineering practices. Weber (et al.) (2010) took initiative to study soft skills needed in entry-level hospitality management positions. The purpose of this project was to have industry professionals in human resources and educators who teach human resources, to rate the importance of soft skill competencies found in the literature. Shakir (2009) studied soft skills amongst students at the Malaysian institutes of higher learning and proposed future research to focus on the appropriate assessment method to facilitate the effective implementation of soft skills development. The concept of core competencies was first addressed in the library literature in 1996 in an article by Nicholas (et al). Patricia Promis (2008) suggested that emphasizing the development or enhancement of Emotional Intelligence (EI) competencies can give information professionals the edge needed to succeed. Dr. S.P. Singh and Pinki (2009) discusses different sets of skills (generic, managerial and professional skills) required by LIS professional to manage the contemporary change brought up by technology accelerated environment. Shorlette Ammons-Stephens (et al.) (2009) proposed a Core Leadership competency model which included four central leadership competencies, or meta-competencies i.e. cognitive ability, vision, interpersonal effectiveness and managerial effectiveness with a total of seventeen broad competencies. Jennine Knight (2009) identifies and discusses the skills and knowledge required for the contemporary Library and information services manager. Helen Partridge (et.al.)(2009) published an article on the contemporary librarian: skills, knowledge and attributes required in a world of emerging technologies. Mr. M.

S. Shridhar (1999) tried to find out gap between knowledge and skill relating to Information Technology emphasizing on various skill requirements of LIS professionals in the new e-world like Technical skills, IT skills and managerial skills. Dr. Christopher Soo-Guan Khoo (2000) reviews the competencies-skills, knowledge and attitudes needed by librarians and information professionals to survive and flourish in the new era. Important competencies were enumerated for librarians, cited by five library directors in Singapore in which Transferable/generic skill was considered one of the important skills for Librarians. Donna C. Chan (2005) surveyed the use of core competencies in six public libraries in Canada. The study showed that four competency types that appeared in every library's list of core competencies were: communication, interpersonal skills, customer service and analytical skills.

After going through these past studies concerned with the soft skill, it is observed that nobody has attempted to focus attention to examine the soft skill of Librarians working in the higher education in Vidarbha. Therefore the researcher has decided to work on the present topic for his research.

3. Need for the study

Librarians assess the informational, educational, cultural and recreational needs of the community they serve, find resources to meet those needs, and provide access to and manage resources. Librarians' duties vary depending on the size and type of organization but, in general, Librarian's duties and responsibilities are:

- Help people access the materials and information they require.
- Answer questions by critically assessing information in reference resources.
- Evaluate, select and purchase materials, and negotiate software licensing agreements.
- Catalogue materials and develop metadata records.
- Develop access/instructional resources such as indexes, bibliographies, web pages, electronic pathfinders and on-line tutorials.
- Evaluate, select, use and maintain library-related computer systems and software.
- Plan and deliver client-centered programs and services (for example, newsletters, public lectures, programs for special groups).
- Design and deliver information literacy instruction programs.
- Collaborate in facility planning.
- Advocate on behalf of libraries and information service, and do public relations work for their organizations (for example, do televised book reviews or community talks).
- Develop library policies and procedures.
- Supervise library staff.
- Conduct related research.

It means Librarians also have managerial responsibilities such as program planning, staff supervision, budgeting and forecasting. In short they have to play the role of Teacher, Technologist, Researcher and Administrator. This study focuses to find out the qualities which are required to fulfill these duties with special reference to Soft skills. Therefore, efforts will be taken to first find out the attributes of soft skill which librarian must possess, thereafter whether Librarian possess these attributes or not and then finally suggesting a module for developing these soft skills through formal training

4. Objectives

- To determine the attributes required by the Librarians to manage their libraries effectively and smoothly.
- To examine the attributes of the soft skills in Librarians working in the Libraries of academic institutions.
- To design the training module for the development of soft skills in Librarians.

5. Scope and Limitations of the Study

The present study is restricted to only those institutions which are affiliated to Sant Gadge Baba Amravati University and located in Amravati city. There are total 412 colleges affiliated to Amravati University out of which 64 belongs to Amravati city. Further only those institutions which are having full time Librarian are considered for the study. It means that where the post of Librarian is vacant or below the rank of Librarian is not considered for the present study. Sometimes responses from the Principals can be biased hence responses must also be collected from limited number of Faculty / Students / Users also.

6. Methodology

A well structured questionnaire is designed and distributed to the Principals/Directors of institutions rather than Librarians themselves for collecting required data. For this Principals are explained these questions and closed ended response was noted down

7. Observations and Findings

On the basis of collected data following observations are made namely:

For achieving first objective of study the author has identified 113 attributes of soft which are required for Librarian through Literature search. These 113 attributes are further grouped in seven main headings namely - Communication/Persuasion Skills, Performance Management Skills, Counterproductive skills, Self Management Skills, Interpersonal Skills, Leadership/Organization Skills and Political/Cultural Skills. Total 200 marks are allotted to these 113 attributes. Each group is allotted marks according to their importance say Leadership/Organization Skill was considered most important and hence maximum marks were allotted to this group that is 37. Further Interpersonal skills was allotted 36 marks, Communication/Persuasion skills 34 marks, Self management skills 29 marks, Performance management skills 27 marks, Political/Cultural skills 24 and lastly Counterproductive Skills was allotted 13 marks.

- Group I : Communication /Persuasion Skills
- Group II : Performance management Skills
- Group III : Counterproductive Skills
- Group IV : Self-management Skills
- Group V : Interpersonal Skills
- Group VI : Leadership/Organisation Skills
- Group VII : Political/Cultural Skills

From the collected data it is observed that 58.82% Principals feel that Librarians are lagging in soft skills and need to develop it for effective performance in their Libraries. Only 47% of Librarians were observed to possess proper Communication/Persuasion Skills among 17 respondents in Amravati which is above 70%. 58% Librarians scored above 70% in Performance Management Skills, 35% in Self-Management Skills, 52.94% in Interpersonal skills, 29.41% Leadership/Organization skills and 35.20% in Political/Cultural Skills. Overall only 41.17% Librarians scored above 70% in soft skills according to the Principals. The present study also shows that counterproductive skills which are expected to be lowest in the Librarians scored more. It is observed that 76.47% Librarians scored more than 30% in counterproductive Skills.

Above findings suggest that there is need for specialized soft skill trainings for Librarians. Soft Skills module can be included in Library and Information Science Curriculum also so that Library Science professionals give high productivity at entry level itself. Hence a Module of Soft Skills must include above seven modules for training Library professionals.

8. Conclusion

Performance of Librarians can be improved by focusing on Hard Skills as well as Soft Skills. Though there is certified training for Hard Skills through Structured Curriculum but Soft Skills is yet to get place in certified training of Soft Skills. Moreover Soft skills of Librarians are never measured at organization level, which hampers the effective performance of Librarians.

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Today's Library Intern, Tomorrow's Library Professional: A Success Story of Internship Programme at Central Library, IIT Delhi

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Abstract

Obtaining a professional position in the field requires real world experience. Theoretical facets form the backbone, but exposure to real-life situations need not be ignored. 'Sustainable professional competencies' warrant for the continued education and training of the LIS professionals in general and the new entrants in particular. This paper discusses the prospects of the Library Internship, Objectives and purpose of Internship, Types of Internships, and Advantages for doing Internship. The paper is also described the required skills, qualifications and competencies for library internship. Internship at IIT Delhi elaborates the procedure of appointing of Interns.

Internship, Intern, Library Internship, IIT Delhi

1. Introduction

Internship is an individualized training program mat combines learning new library skills outside the classroom and the demonstration of those skills according to a planned schedule of activities. An internship provides an invaluable learning experience, an opportunity to explore a potential career field, a chance to learn and teach beyond the classroom, and a vehicle for gaining hands-on experience that will enhance any resume, graduate school application, or law school application, regardless of the nature of the internship itself. The paper evaluates and describe the internship programme offered by the Central Library, IIT Delhi.

2. Purpose of Internship

Any library internship training serves the purpose of both- the intern as well as the host library/institution. It is supposed to add value to both the parties. Those purposes maybe elaborated as below:

- To equip them with necessary skills and competencies;
- To get them good remarks/grades for the certification
- To increase the knowledge and skills of recent technologies;
- To prepare them for future job responsibilities;
- To suffice the manpower requirements of the library;
- To upgrade their skills in a specific area of information service;

3. Objectives of Internship

The objective of the internship programme is to provide a framework through which graduate and postgraduate students from library and information science academic backgrounds may be assigned to the library and information activities to enhance their educational experience through practical work assignments. It allows selected candidates to gain insight into the work of the library and provides assistance and training in various library and information professional fields. A well planned library internship program will successfully meet the following objectives:

- Achieve greater sophistication in integrating theoretical knowledge with specific information needs.
- Achieve greater sophistication in utilizing theoretical knowledge acquired during the graduation
- Begin to solidify a 'professional identity' that is consistent with one's own personal sense of self, values, strengths, and limitations, and professional interests.

- Further acquire and solidify knowledge and skills in providing information services and professional communication.
- Further develop ability to apply ethical and professional standards to the provision of information services and negotiating professional relationships.
- Further develop and solidify knowledge, skill, and self-awareness relevant to the provision of individual psychotherapy.
- Further develop competency in multicultural and diversity awareness in information practice and develop skill in communicating verbally and in writing (efficiency, clarity, quality, accuracy)
- Learn to demonstrate a sense of professional responsibility to users, colleagues, staff, fellow trainees, and others as a whole.
- Maintain appropriate professional boundaries and respectful relationships with users, colleagues, staff, supervisors, fellow trainees, etc.
- Recognize ethical issues and dilemmas, and make sound ethical judgments.

4. Types of Internships

The internship may fell in either of the below mentioned categories:

- 'Paid' or 'Un-paid' Internship;
- 'Internships for Credit' or 'Learning by doing' or 'train and gain';
- 'Non profit' Internship;
- 'Summer' Internship;
- Service learning;
- Cooperative Education;
- Externship;

4.1. 'Paid' or 'Un-paid' Internship: Paid internships exist primarily in the public and private sector or in large organizations that have the money to pay students to learn while they work. Given a choice of paid or unpaid internship, paid internships are definitely the internships of choice. More and more organizations are recognizing the value of internship programs and the enormous benefit they play in the recruitment process. As these organizations work to train interns, they are also scrutinizing them on all fronts to evaluate their potential as potential future full time employees. For this reason, companies that can afford to pay their interns are usually make a decision to go ahead and do so.

4.2 Internships for Credit: Internships for credit require that the experience is strongly related to an academic discipline to be deemed "credit worthy". The main question is determining the value of the internship experience in a higher education context. Internships that are primarily clerical or mechanical do not qualify for academic credit. Students looking to do an internship for credit usually need to have an academic sponsor to oversee and set criteria for the internship. To meet the academic component of the internship, students may be required to complete a journal, essay, or presentation during or immediately after the internship to illustrate the knowledge and skills they learned over the course of the semester.

4.3 Non Profit Internships: Doing an internship for a non-profit organization is usually quite different than working in an organization for profit. In a non-profit organization, there are no stockholders and no one shares in the annual profits or losses that are determined by the organization each year. Non-profit organizations include charities, universities, government agencies, religious organizations, and some hospitals. Since the purpose of these organizations is not to make money, instead they focus more on providing a service. Interns generally do not get paid when interning at a non-profit. Completing an internship in a non-profit organization provides some very useful skills required by employers when seeking to hire entry-level employees in this field.

4.4 Summer Internships: Such type of internship is also known as 'Ad-hoc' internship which is offered 'for the particular period'. Summer internships are usually eight to twelve weeks long and can be full or part time. More students do internships during the summer than during any other time of the year. These short term experiences provide a real insight into what it's actually like working in a particular job or career field. There's ample time to get into a regular work routine and gain valuable knowledge and skills. Summer internships can be completed for credit but they don't have to be. Getting credit during the summer can be helpful since it can lighten a student's course load during fall or spring semester but the downside is that most colleges require tuition in order for student to receive credit.

4.5 Service Learning: Although there are different perspectives on what constitutes services learning, there are several specific criteria that must be met for an experience to be considered a service learning experience. Service learning requires a combination of meeting specific learning objectives by completing some type of community service work. It is different from other forms of experiential education in that it requires that the recipient and the provider of the service both benefit in some way and are changed equally by the experience. These are very structured programs that require self-reflection, self-discovery along with gaining the specific values, skills, and knowledge required for success in the field.

4.6 Co-Operative Education: The main difference between an internship and a co op experience is length of time. While internships generally last anywhere's from a few weeks to several months, co op's normally last one or more years. Usually students will attend classes and work on their co op simultaneously or they may do their co op during winter and/or summer breaks. Co ops and internships are both excellent ways for students to gain valuable knowledge and skills in their field of interest plus they offer an opportunity network with professionals already working in the field.

4.7 Externship: Externships are very similar to internships but only of a much shorter duration. Another common name for externship is job shadowing. Although these opportunities may only consist of one day to several weeks, they tend to offer participants a bird's eye view of what it's actually like working in a particular career field as well as providing some professional contacts for future networking.

5. Advantages of Library internship

Internships help to assess the strengths and develop a plan for areas needing improvement; gain self-confidence and achieve a professional level of maturity; improve interpersonal skills. Library Internship provides several advantages such as:

- Creates mentoring and networking opportunities for recent graduates as well as provide for professional development and training;
- Enables the participant to benefit from the insights of a librarian who is professionally trained and experienced in some specialty of interest;
- Enables to network with professional librarians;
- Fosters closer cooperation between staff members of neighboring libraries;
- Helps the intern to discover his/her own individual styles and approaches that are consistent with the sense of self, values, strengths, and interests.
- Internship training can be customized to meet a candidate's unique requirements regarding time, travel, and interests;
- It also saves on the staff salaries for the host Library;
- Manpower burdens of the host library/institution are reduced;
- Provides a chance to apply the skills learned in Library School and learn new ones;

- Provides an opportunity to discover the multitude of opportunities within an academic library setting;
- Provides experience to recent graduates interested in exploring a career in academic libraries;
- Provides opportunities for the intern to engage in outreach and consultation activities;
- Saves huge amount of money for the host library/institution;

6. Library Internship at Central Library, IIT Delhi

- **IIT Delhi Library System :** The IIT Delhi Library System comprises of a Central Library and 20 departmental libraries that collectively support the teaching, research and extension programmes of the institute. All students, faculty and employees of the institute are entitled to make use of the library facilities. The alumni, industrial establishments, faculty-students of outside organizations, wards of IIT faculty and staff can also avail the library facilities as per the prevailing rules. The library presently has approximately 9000 registered users. The Central Library has a strong collection pertaining to physical sciences, engineering and technology, biotechnology, computer and information technology, social sciences and management.

- **Internship at Central Library, IIT Delhi:** The Central Library, IIT Delhi has introduced an ongoing paid Library Internship programme. Under the programme, internees are appointed in the Library at a monthly stipend of depending on the qualification of the candidate to Library professionals having different qualification in this field. Internship was started at Central Library IIT Delhi in 2007 and only 03 positions were sanctioned. Currently there are 11 approved positions of Internees at Central Library IIT Delhi. Every year IIT Delhi is advertising these positions for its Central Library. The Central Library also offering the unpaid internship for a limited period to the students of different universities (e.g. Jamia Millia Islamia, Jiwaji University, Merabai Polytechnic, etc.) where the internship is a part of the curriculum.

- **Procedure for Appointing Library Internees:** There is a number of library science schools in Delhi as well as outside Delhi those are running Masters/Bachelors/Diploma in Library and Information Science course those are the source for obtaining Library Internees. The advertisement for Internee is being sending to these schools and it also be posted on Institute website by the Central Library for vide publicity. The applicants for the Library internship are being shortlisted/selected through a formal written test/interview.

- **Internship Period:** Internship is initially offered for a period of six moths which is extended for further six months on the basis of satisfactory performance by Intern. After completion of stipulated period of one year, Interns are not being allowed to continue.

- **Educational qualification and Stipend:** The candidates with Two years Diploma in Library Science/B.Lib.I.Sc./M.Lib.I.Sc. are eligible for the internship. Currently, the Central Library, IIT Delhi appointing Internees at different level of qualifications in Library Science at stipend mentioned below:

    - Students having Two years Diploma in Library Science: Rs. 8,000 per month.
    - Students having Bachelor's Degree in Library Science: Rs. 11,000 per month
    - Students having Master's Degree in Library Science: Rs. 13,000 per month

- **Nature of Internship:** There are five major sections at Central Library, IIT Delhi namely; Reference Services, Library Acquisitions and processing, Serials, Text Book and Book bank and Library Computer Unit. Each intern is spending one to two months in each section of the Library. Apart from these section Interns are involved to all major activities like digitization, RFID implementation and exposure of other activities at Central Library, IIT Delhi.

- **Certificate/Job Placement:** After completion of Internship Internees are evaluated at different level and a certificate is provided. It has been observed that Internship Interns are getting the job at different IITs, NITs, IIMs, IISERs, Central Universities, Public Sector and other private institutions/colleges all over the country. Some Interns are engaged in Research work at different fields of LIS.

Following tables are describing State-wise Internee joined, Number of positions and stipend paid to the Internees during the year 2007-2013 :

- **State-wise Internee joined during the year 2007-2013**

Table No. 1

S. No.	State	2007	2008	2009	2010	2011	2012	2013	Total no. of Internees
1.	Uttar Pradesh	--	--	01	05	05	07	05	23(40.35%)
2.	Madhya Pradesh	--	01	08	03	02	02	02	18(31.57%)
3.	Delhi	02	03	02	03	01	--	--	11(19.29%)
4.	Uttarakhand	01	--	02	--	--	--	--	03(5.26%)
5.	Chhattisgarh	--	--	--	--	--	01	--	01(1.75%)
6.	Himachal Pradesh	--	--	--	--	--	01	--	01(1.75%)
Total		**03**	**04**	**13**	**11**	**08**	**11**	**07**	**57(100%)**

Table No.1 shows State-wise Internees joined during the year 2007-2013. It has been observed that during above mentioned period total 57 Internees have joined the Internship programme at Central Library, IIT Delhi. It has also been observed that 23(40.35%) Internees passed-out their Master's or Bachelor degree in LIS from the different Universities in Uttar Pradesh; followed by 18(31.57%) Internees Madhya Pradesh; 11(19.29%) from Delhi; 03(5.26%) from Uttrakhand and only 01(1.75%) each Internee passed-out their degree from Chhattisgarh and Himachal Pradesh.

- **Year-wise number of positions and stipend**

Table : 2

Year	Total Sanction positions	Stipend (Category-wise) (In Rs.)		
		MLIS	BLIS	Diploma in LIS(2yr)
2007	03	6,000	5,500	NA
2008	04	6,000	5,500	NA
2009	06	8,000	6,000	5,500
2010	08	9,000	7,000	5,500
2011	08	11,000	9,000	7,000
2012	11	11,000	9,000	7,000
2013	11	13,000	11,000	8,000

Table No. 2 shows the number of sanctioned positions and the stipend paid to the Internees during 2007-2013 at different level of qualification. It shows the gradual increase of number of posts and the stipend in all categories.

7. Planning a Better Library Internship Programme

Planning for an internship begins when a library staff member and the Head of the library discuss the needs of that staff member for future education and training. The well-planned internship prepares the intern for future job responsibilities. It should be related to the needs of the library as a whole and to the needs of the intern in particular. The internship should be a step in the logical progression of continuing education for the candidate. To put it in right perspective, this planning of the Internship program comprises the components mentioned below:

- Educational Requirements,
- Duty Hours/Timings,
- Internship period,
- Nature of the internship,
- Number of Interns,
- Stipend/Remuneration,
- Areas of Training,
- Leave and other facilities,
- Evaluation Criteria,
- Certification and Placements,

The final plan for the internship should be drafted out neatly in writing, with copies provided to the intern, and the advisor/supervisor. It is also advisable to have an approved internship policy.

7.1. Areas of internship training

Depending upon its nature, an internship can be conducted at the institute's main library, or the departmental libraries. However, training at larger libraries is recommended. The internship may be general or specific in its area of operation.

The areas of internship training can be categorically announced well before it begins. They may be general or specific. Some of the areas worth to mention are:

- Circulation and Reference Services
- Library Acquisitions and processing
- E-Resources and Digital Library
- Serials/Periodicals
- Special Collection and Manuscript
- Knowledge Management

8. Evaluation of the internship

Evaluation of the library internship program is to make out whether the set objectives have been achieved, whether the intern possesses the expected training outcomes and many more such issues which help in

providing grades or certification and also to suggest further improvements if any. Some of the components associated with the evaluation of internship maybe summarized as below:

- **Attendance:**
- Following the schedule and absenteeism.
- Timings of arriving and leaving.
- **Professionalism (dress, conduct, manner):**
- Presented a professional manner with the other librarians
- Presented a professional manner with patrons.
- **Abilities:**
- Showed ability to get along with others in a team environment.
- Showed ability and willingness to learn new things and/or to be corrected.
- **Job preparedness:**
- Possessed fundamental understanding of librarianship applicable to internship.
- Possessed basic skills and knowledge needed for the duties and responsibilities of the internship.
- **Experience:**
- Seemed to gain much from this internship.
- Made a noticeable contribution to the department.
- **Student Progress:**
- Has learned significantly through this internship/improved since the last evaluation.
- Can be recommended for further internships and responsibilities.
- **Continuing Interest:**
- The internship program has worked out well.
- We are interested in continuing our participation in the internship program.

9. Conclusion

Students take advantage of internships to explore careers, to gain professional experience, and to earn academic credit. The importance of internships for securing full-time work has dramatically increased over the years; these days, an internship is less of an opportunity and more of a requirement. There is a need to prepare the young professionals to assume the pro-active role in coping with new technology and the information explosion. In a nutshell, any such Internship program will help them in developing knowledge, skills and tools for the creation, collection, communication and consolidation of information. This will definitely turn a golden opportunity for the young professionals to empower themselves by way of imbibing all the necessary skills and competencies to meet the new challenges of ever growing Information Society. This has to be done at par with the 'Medical Professional Internship'. There is an urgent need of accommodating 'Library Internship' in the LIS curriculum at the national level. This can be made a 'compulsory exercise' as a partial fulfillment of the Post-Graduate Programme in Library and Information Science.

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User Education Programme: A Case Study of NCERT Library

Pooja Jain

Abstract

User Education Programme has been a in-depth part of Library work and is a commitment to serving the institution research needs, the library's users. Educating the users about the existent resources and services in the library is the prime objective of the User Education Programme. It helps the reader to get the right information from the right place in the right way with the minimum efforts and with the short span of time. This paper explains the NCERT, being the special library on Education and the regular and new users frequently visiting from the national and international level. So to orient these users the user education programme is being implemented and carried out in the library i.e. Library and Documentation Division. User Education Programme has a great importance in every library for maximum utilization of existing resources with minimum time and efforts.

Keywords: User Education Programme, Orientation Programme, NCERT Library

1. Introduction

User education means educating the user regarding the usage of library. Enormous amount of money is being spent to collect library resources so guiding the users in exploiting the library resources is an essential function of librarianship and is known as user education. It always helps readers to make the best use of available resources and services with ease and less time. It also works as step before the information literacy programme. User education programmes are given to ease the work of librarians and quicken the efforts of clientele in getting and utilizing the library materials.

Education is never ending process. Library use skills are important and essential part of education which helps in a great deal for its purpose. User Education is inspired by the idea of 'independent study'. To be independent, reader needs to know the methods and develop the skills to find his/her own way to the domain of accumulated knowledge.

Fleming,(1990) defined user education "as various programs of instruction, education and exploration provided by libraries to users to enable them to make more effective, efficient and independent use of information sources and services to which these libraries provide access. In India while Ranganathan has put more emphasis on pinpointed, exhaustive and expeditious reference service", Girja kumar has been a relentless supporter of user education and has written extensively on the subject. He believes that "while reference service is spoon feeding at its best, the basic object of user education is to make the user independent of the intermediary (the reference librarian) and enable him to have access to information independently". There is no doubt that user education helps the readers in their pursuit of lifelong education. It can play an important role in their overall educational process.

2. National Council of Educational Research and Training and its Library

NCERT (National Council of Educational Research and Training) has been established in 1961 as an autonomous organization to assist and advise the governments at the Centre and in States in the implementation of their policies for education, especially to bring about qualitative changes in school education and teacher preparation. NCERT with its increasing range of activities influenced on school education in India, it provides technical and academic support for the improvement of school education. NCERT headquarter is situated at Delhi as NIE (National Institute of Education) and has the five Regional Institute of Education (RIEs) at Ajmer, Bhopal, Bhubaneswar, Mysore, Shillong and two institutes as Central Institute of Educational Technology (CIET), Delhi and PSS Central Institute of Vocational Education PSSCIVE, Bhopal.

The specific functions of NCERT include: (a) research and development; (b) in-service and pre-service training; and (c) dissemination of research on school education in India. Accordingly NCERT develops curricula, instructional materials, teaching aids and learning resources; organizes pre-service and in-service training of teachers, of teacher educators, and of other educational personnel; conducts and promotes educational research related to pedagogical improvement; disseminates improved pedagogical techniques, practices and research findings; acts as a clearing house of ideas and information for all matters relating to school and teacher education.

3. Library and Documentation Division (LDD)

The library came into existence in 1967 as a result of amalgamation of various independent departmental libraries of NCERT. It is situated at ground, 1st and 2nd floor of Govind Ballabh Pant Block at NCERT (Head Quarter), New Delhi since 1980. LDD has a rich collection of books (general, text and reference) and journals in the field of education and allied subjects and various reports for its readers. NCERT library is fully automated library using the LIBSYS software. The URL of website is http://www.ncert.nic.in/ncert/index.html. The library is the most resourceful information centre in the country in the field of Education and its interdisciplinary subjects. The library has the largest collection of books, journals and other related materials in the field of School education.

The NCERT library is named as Library and Documentation Division (LDD). The vision of LDD is to create a network of knowledge system that facilitates the achievement of the main objectives of NCERT. Its mission is to strengthen its members through learning, advocacy and networking initiatives with a goal to strengthen its role as information leaders in the organization and the communities. It aims is to respond to the readers needs, adding qualitative and quantitative value to information services and products.

4. Function

The main task of library is to supplement the efforts of NCERT in fulfillment of its main objective towards quality improvement of school education. In this context the main functions of Library and Documentation Division are to:

- Collect, organise and disseminate primary, secondary and tertiary resources on school education;
- Support academics, researchers and students through conventional references and referral services and document delivery services;
- Facilitate in-services education of library personnel through training programmes, library manuals, etc;
- Disseminating bibliographies, accession lists; book reviews, current contents indexing and abstracting of articles, press clippings;
- Market its products and services through extension services;
- Facilitate the readers through resource sharing and DELNET, and
- Provide free internet surfing to the readers.

5. User Education Programme in NCERT Library

There are many methods of user education like extension lecture, Library tour, Printed brochure, Orientation week, Audio – Visual method, Guides etc. Being a special library on Education at national level, regularly new user visits the library throughout the year from other local, regional, state, national and international level to do M.Ed. dissertation work, to prepare synopsis for Ph. D admission, pursuing Ph.D and the faculties from all other institutes carrying out B.El.Ed, B.Ed, M. Ed programme in different capacities. Many readers from local, regional, national international organization who visit the library for varying periods and make use of its valuable resources like textbooks, reference books, bound volumes of periodicals, current periodicals, various government reports, educational surveys, theses, NCERT reports and publication

etc. Therefore NCERT library User Education Programme is carried out round the year. There are mainly two types of user education programme which are practicise in the NCERT library:

- **For group orientation**
- **For individual new users on routine basis**

6. For group orientation

There are several groups of students from different educational institutes and Universities visit LDD as a part of the educational tour, for research purpose for a specific period with the prior permission from their supervisor and respective university and teachers of different schools doing training in NCERT which is the one of the important activity.

The group orientation is provided in the seminar room of NCERT where the participants are oriented through projector with the help of online guided tour to the NCERT Website. The website of library is updated on regular basis. User Education Programme is initiated with the brief introduction about history of NCERT and its library and explains about the library timings, collection, facilities, information products and services, different kinds of membership, how to use WEB OPAC, interlibrary loan facility, library rules, databases and online resources of the NCERT Library. It is followed by the tour of library of all the floors by showing the each section- reference section, current journals display, circulation section, general reading room, Adolescence Education Resource Centre, OPAC and photocopy section. The participants are also personally introduced to the in-charge of the respective section who also orient them by physically demonstrating the services and the resources. Printed brochures are also distributed to them for future reference.

7. For individual new users

The users with the Casual Membership are those who can avail the use of library resources and photocopying facility in the library (on payment basis as per the library rules), these are regular new users of the NCERT Library. They are required to enroll themselves as casual members of the library by providing the authentic identity proof like identity card of the educational institution where they are student or employed, proof of residence, voter ID card, or a letter from the university or referred by the supervisor of university. Casual members cannot borrow any book just consult the library for academic purpose. Under this category LDD is having lot of users on daily basis so the basic information is given to each new user by the library staff about the different floors, along with the type of collection at different places as per their need. Books Section, Reference section, Journals section, photocopy facility, text book archive, bound journal section, newsclip series are the main attraction for these users. Library staff actively are involved in training these users how to use the library services and resources so that they would become self reliant. This orientation is given to the user at the time of giving the permission to use the library through offering casual member for the limited period of time as per the need of the user and rules of the library.

At the time of PhD admissions in different universities, a lot of researchers from different parts of the country as casual members used to visit the LDD with a mindset to prepare the synopsis for research purpose. As mentioned by their supervisor, most of them come with the topic.

Some of the researchers even don't understand the different aspects covered in the single topic like ***"Mental stress and emotional status of Adolescent Girls of secondary schools during examination: a study in Bihar"*** Now this topic include mainly the broad subjects psychology, health aspect, adolescent girls, school examination, Bihar which must be keep in mind for preparing the review of literature for submission of synopsis.

The general trend of the new users in the Library is that the users and researchers have less patience with the attitude of getting the things readymade. The librarian or library staff has to motivate the users that they will definitely get the required material from the library. The library has to guide the users how to search, how to use resources and services of the Library

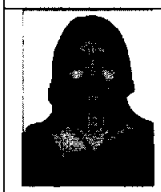
8. Conclusion

User Education Programme presently is not taken into much consideration in many libraries due to lack of interest among library personnel, shortage of staff etc. It has been experienced and suggested that User Education Programme must be an important activity for every library at different levels as per the need of the user. It is an ethical duty of the librarian and library staff to create quality product and to be productive citizen. User Education Programme may convert the new user of the library to be the information literate. Participants perceived information literacy as valuable, and agreed that the library plays an important role in developing the skill of locating information. In the present information technology environment, it is also demanding on the part of the librarian to find out the strategies to attract the users to visit the library and maximize the utilization of available resources. Effective user education naturally enhances the active learning techniques and life-long learning.

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Academic Plagiarism and Copyright Infringement: *The Need for Intellectual Honesty*

Harpreet Kaur



This article deals with a range of resources relating to issues surrounding academic dishonesty and copyright infringement cases. Close examination of the literature shows that technology has helped to ease a student's ability to commit acts of academic dishonesty and infringe copyright laws but has not been the sole reason behind acts. Instead a lack of understanding and education has resulted in a student's inability to successfully write articles using proper citations. Academic librarians need to develop education based plans for raising awareness about academic dishonesty, copyright laws. This paper discusses about the tools for detecting Plagiarism, Preventing Acts of Academic Dishonesty and Copyright Infringement. It also highlights the Library Operations involving Copyright Issues.



Plagiarism, Academic dishonesty, Copyright infringement, Digital Millennium Copyright Act, Ethical Behavior.

1. Introduction

Academic plagiarism occurs when a writer repeatedly uses more than four words from a printed source without the use of quotation marks and a precise reference to the original source in a work presented as the author's own research and scholarship. Continuous paraphrasing without serious interaction with another person's views, by way or argument or the addition of new material land insights, is a form of plagiarism in academic work.

Plagiarism is not the same as copyright infringement. While both terms may apply to a particular act, they are different concepts. Copyright infringement is a violation of the rights of a copyright holder, when material restricted by copyright is used without consent. On the other hand, the moral concept of plagiarism is concerned with the unearned increment to the plagiarizing author's reputation that is achieved through false claims of authorship.

2. Following are the two cases which show plagiarism

- Plagiarism is a serious problem when it is being practiced by scientists and archaeologists. Former professor of Punjab University in Chandigarh, Vishwajit Gupta, was found to have fabricated research on fossil findings and to have used information and photographs by other researchers.
- In 2008, a U.S. student at the University of Texas, Arlington, sensed something fishy while peer reviewing a paper by Professor Pattium Chiranjeevi. Chiranjeevi, who had published more than 70 academic papers in international journals, had been teaching at Sri Venkateswara University in Tirupati. The student found that Chiranjeevis's work had been plagiarized, and further investigation showed that instruments cited in his reports were not even at his disposal.

3. Types of plagiarism

- **Full/Direct Plagiarism:** Using the exact words from a source without any changes to the language, thoughts, flow and even punctuation and then presenting them as one's own is known as full plagiarism.
- **Minimalistic Plagiarism**: It is most common type of plagiarism, when the plagiarist presents someone else concept, ideas, thoughts or opinions in their own words or in different flow or punctuation is known as minimalistic plagiarism. Although most of the people do not regard this as plagiarism but in actual it is considered as stealing someone's study or thoughts.

- **Source Citation:** When complete source information is mentioned in the work, it is not treated as plagiarism, it is called complete source citation. However, the definition of a complete source citation varies very much. Some writers quote the source's name, but don't give other information to access the source. While some give false references about the source, some just merge their information with an original piece of writing.
- **Self Plagiarism:** When someone uses their previous work for a separate assignment, it is treated as self plagiarism. Although they are using their original words and thoughts but it is considered cheating/ plagiarism when credit is being received for previous work. **Structure Plagiarism:** The plagiarist paraphrased another's words by changing sentence structure or paraphrasing with maintaining original sentence structure with proper acknowledgement of source.

4. Causes of Plagiarism

- **Lack of Interest:** The academicians apprehend that the deadline to complete the assignments or paper writing involves time and hard work. Hence, they are unwilling to work harder and honestly. Therefore, they indulge in copying the content to complete their papers leading to plagiarism.
- **Lack of Time:** To save the precious time, academicians including students and teachers adopt easy way of finding and manipulating data on internet as compared to production of original analysis and interpretation.
- **Stress and Competition:** To gain academic achievements, to improve the professional profiles, academicians have a strong pressure from their family, peers to compete amongst themselves. This stress, fear of failure and lack of confidence leads them to do plagiarism.
- **Incapability:** Academicians, both students as well as faculty, may feel embarrassed to seek help when they are incapable to accomplish a particular task. With the intention to avoid the embarrassment of taking assistance from peers or other friend professionals, they depend upon seeking assistance from online sources. Moreover, they believe that the quality of online available material is always better as compared to their own work. Thus, plagiarism occurs.
- **No Fear of Punishment:** Since several people indulge in the act of plagiarism and there is no severe punishment or penalties accorded to the plagiarists, so they think that the benefits of plagiarism are much more than being caught. In such cases, lack of fear of punishment also leads to plagiarism[3].

5. Why we concerned about plagiarism

- **If you plagiarize, you are cheating yourself:** You don't learn to write out your thoughts in your own words, and you won't receive specific feedback from your instructor geared to your individual needs and skills.
- **Plagiarism is dishonest or misleading:** Because it misrepresents the work of another as your own.
- **Plagiarism violates the code of Academic conduct:** It can lead to suspension or dismissal.
- **Plagiarism devalues others work:** Using and submitting a professional's work as your own is taking an unfair advantage over students who do their own work

6. Guidelines for Avoiding Plagiarism

- Use your own words and ideas.
- Give credit for copied, adapted or paraphrased material.
- Avoid using others work with minor changes.
- When in doubt, cite.

7. Tools for detecting Plagiarism

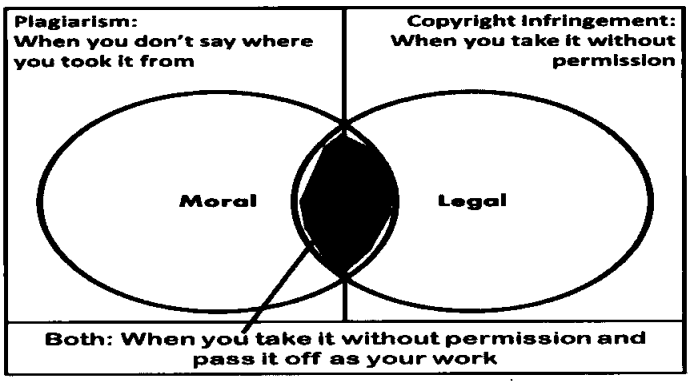
There are several websites available to identify plagiarism online. These websites analyze the long texts and examine multiple documents at once. Some are paid for and some are free. Several plagiarism detection software packages are also available.-paid for and free. The academicians use these detector tools to detect the plagiarism as well as teach their students how to cite sources[4].

Below mentioned are the website detectors used for plagiarism:

- CopyScape.com
- Plagiarismfinder.com
- Safe Assignment.com
- Duplichecker.com
- Turnitin.com

8. What is the difference between Plagiarism and copyright infringement?

Plagiarism covers a spectrum from word for word textual copying, through changing some words but retaining the basic structure, through to copying ideas and arguments. The common thread is that the copying is dishonest because it is unacknowledged. If you quote from another author, and provide the citation, then in general you are not a plagiarist. Copyright by contrast involves two steps. The first is to establish whether or not the new text involves any copying of the old. The second is whether the copying is substantial. By and large the question of acknowledgement is irrelevant. An acknowledgement can be called into help as part of a defence when the infringer argues that the copying was for a permitted use, such as non-commercial research, or criticism or review. Even with an acknowledgement, an author is not free to copy as much as he likes, and there are plenty of cases where there has been an acknowledgement, but the aggrieved publisher has been successful because the infringer has used material of economic value.



Copyright infringement and plagiarism is a violation of ethical behavior in which someone's ideas are used without giving the originator credit. People who take chunks of text written by others and represent it as their own are infringing the copyright and plagiarizing.

9. Copyright Infringement within the Context of Copyright Laws

Oxford's Dictionary of Law defines copyright as "the exclusive right to reproduce or authorize others to reproduce artistic, dramatic, literary, or musical works" (Law, 2006, p.129) infringement would describe the unlawful reproduction of those same listed works.

Copyright laws have existed in the United States since 1790, those earliest laws only covering books and other printed materials. By the 1970s the government was taking a new approach to copyright by protecting "original works of authorship fixed in any tangible medium of expression" (Schneider, 2001, p.72). With the

continual evolution of technology, protecting works in a variety of ever-changing mediums has become extremely important.

The most significant development in copyright law came about in 1998 with the adoption of the Digital Millennium Copyright Act (DMCA). This law created exceptions and limitations to specific portions of copyrights in order to protect libraries from misdirected legal suits.

10. Library Operation involving Copyright Issues

- **Photocopies:** Making Xerox copies of documents for wider use when additional copies or reprints are not available.
- **OCR Technology:** Using Optical Character Recognition technology converting print material into electronic form for networking.
- **Archiving:** Rare books, out-of print books, unpublished manuscripts are converted into digital format for archival purposes.
- **Multimedia Products:** Original CR Law protects print, audio and visual products separately. All these are clubbed into a single product in multimedia and there are no clear cut policy of CR dealing with them.
- **Digital Libraries:** These are virtual libraries with no boundaries limiting their collection. They span across geographical boundaries all over the world. Copyright Law, literally speaking, does not approve of this[7].

10. Preventing Acts of Academic Dishonesty and Copyright Infringement

In the realm academic dishonesty, educational institutions have taken several approaches to deter students from committing acts of plagiarism. These approaches focus on minimal amounts of "education" on the subject and larger amounts of warnings and threats of punishment. As technology has been contributed to the downfall of academic integrity, faculty – interestingly enough – turn to technology to combat dishonest writing methods. One of the most common forms of technology "prevention" is the program called Turnitin, however some researchers have equated this method to a "guilty until proven innocent" mindset (Germek, 2009, p.347).

Yet one of the most common practices for preventing academic dishonesty is to provide students with a definition of plagiarism. On some occasions a student may be asked to sign a piece of paper that they understand the definition and that they understand the consequences if they engage in any dishonest behavior. However, the rising rates of academic dishonesty point to the fact that these measures are doing very little to prevent or slow the advance of cases of dishonest acts.

11. Improving Prevention in the Future

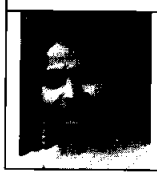
Plagiarism and copyright infringement are items that are rarely discussed in libraries. For this reason, the librarian is called to the forefront as the next step in preventing acts of academic dishonesty and copyright infringement. It becomes difficult for academic librarians to consider themselves writing instructors unless they have some sort of background or formal study on the subject. For this reason, it can be difficult for librarians to work alongside of other faculty members in establishing course plans related to writing or research methods without feeling as though they are stepping on someone's toes. Barriers, such as these, need to be broken down in order to extend information literacy education outside the library setting and into the classroom. It becomes imperative for librarians to form some sort of a partnership with campus faculty and administrators to improve awareness of academic dishonesty and copyright policies (Germek, 2009, p.354).

12. Conclusion

Technology has greatly increased access to information that was traditionally difficult to find. For that reason, the idea that plagiarism and copyright infringement has increased due simply to the development of technology has become a standard thought process. Instead, the available literature seems to point in another direction. The evolution of technology has provided for a fast vehicle to commit acts of academic dishonesty and violate copyright however, it has not contributed to students committing those acts in the first place. It has become widely accepted that plagiarism has been an ever present issue well before technology came to be. In that sense, there is a much deeper explanation for why students plagiarize and violate copyright laws; misunderstanding and lack of education. From research presented within the literature, the lack of education stems beyond the realm of the educational institutes originating in the primary and secondary education ranges. Students are not presented with fundamental methods for writing papers or researching and they receive little or no education on the matter until reaching the collegiate level. When examining the reasons behind why students engage in acts of academic dishonesty and copyright violations, it is clear that education is and will be the main solution to the problem. As academic librarians strive to engage themselves as educators, teaching an understanding of plagiarism and copyright policies to students will greatly influence academic rigor. Education will not only lead to a decrease in cases of academic dishonesty and copyright violations, but it will help to return a sense of honor to research and scholarship at educational institutes.

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Anti -Plagiarism Software: *An Overview*

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Plagiarism means copying words or ideas from internet or book or other text material without proper citation. Due to Online facility plagiarism made easier. By just one click, copying work has been made easier. Software tools have developed to detect plagiarism. This copying practice is not only done by students but also by faculty who publish paper. They copy some portion of the text or copying whole matter with slight modification. Apart from this the paper defines the term 'plagiarism' and discusses advantages and drawback of the anti-plagiarism software and also suggests how to avoid online plagiarism. This paper will help to improve the quality of research paper, theses and dissertation



Plagiarism, anti-plagiarism software, online plagiarism detection tools, plagiarism checking software, Intellectual property right violation.

1. Introduction

Plagiarism comes from the Latin word plagiarius, which means abducting, kidnapping, seducing or plundering. The English word 'plagiary' firstly surfaced in 1601 in Ben Johnson's 'The Poetaster', means a literary thief who wrongfully takes another's words or ideas. In other words, plagiarism is an act of *fraud*. It involves both stealing someone else's work and lying about it afterward. Plagiarism is an important ethical issue, but many researchers are still not aware of its seriousness.

2. Anti- Plagiarism Software

Anti-plagiarism software is detection software that scans and compares the contents submitted by people with an electronic database to detect digital plagiarism. There are a number of anti-plagiarism tools available to detect plagiarized material. These tools can be divided into two categories one is commercial software for which we have to pay money and use. Another is open source software which is freely available in the internet.

- **Commercial or Proprietary Software:** Here is the list of proprietary anti-plagiarism software. **Turnitin:**http://www.turnitin.com/: Turnitin, a plagiarism.org partner, is an internet –based plagiarism-detection software. This is one of the best proprietary software available in market. It is use not only for checking research paper, but also university and college use for checking the theses and dissertation too. For example, Madras University, Pune University, and Pondicherry University use this software. UGC also recommends this software. Free trials are available, and subscription costs vary depending on the type of plan chosen.
- **CopyCatch Gold:** http://www.copycatch.freeserve.co.uk/: A forensic linguist at CFL Software Development with extensive experience in plagiarism developed this software for teachers and students. The cost of a single user license for educational use is £250 per year.
- **DocMate:** http://www.safe-corp.biz/. DocMate has full version and LT version. The full version is the professional tool. It creates a database containing matching elements between two sets of documents. The LT version produces an easy-to-read HTML report showing words, sentences, and Para- graphs that are identical or similar in every pair of documents. It is priced..
- **EduTie.com:** http://www.edutie.com/. EduTie.com was founded in August 2000, and is designed to help institutions prevent Internet plagiarism. It is built on the PlagiServe (http://www.plagiserve.com) core

design. Papers submitted are compared to more than 1 billion "high risk" Web pages in an attempt to detect plagiarism. Free trials of the software are available.

- **EVE2: Essay verification Engine:** http://www.canexus.com/eve/index.shtml. The EVE plagiarism detection system is one of the older services on this list, having performed almost 150 million scans since its creation in 2000. It runs users $29.99 for unlimited use and includes a 10-day money-back guarantee.EVE2 claims to come as close as possible to searching every site on the Internet to detect plagiarism by "employing the most advanced searching tools available to locate suspected sites. Free fifteen day trials are available, but the software must be purchased after that time to continue using it.
- **Plagiarism.org:**http://www.plagiarism.org. University of California Berkeley students and alumni created plagiarism.org to be used to detect plagiarism. One thing to watch out for is that the software doesn't differentiate between quoted materials and original writing.
- **PlagiServe:** http://www.plagiserve.com/. Olexiy Shevchenko, Max Litvin and Sasha Lugovskyy, the PlagiServe Team, came up with the concept of a plagiarism detection device in June 2000. The software used by PlagiServe not only detects papers that have been obtained from a term paper company and turned into an instructor, but it also looks for any changes or modifications made to these papers. PlagiServe has a database of over 150,000 student essays, term papers and cliff notes, and they also send out Web robots to check "high risk" sites like Britannica.com, Refdesk.com and Encyclopedia.com for copied materials.
- **Plagiarism Detect: http://plagiarismdetect.com/.** Plagiarism Detect scans text at a rate of $0.50 per page. The system takes about 5-7 minutes per page, which makes for thorough examination. According to the website, Plagiarism Detect has recently updated its system with a new advanced algorithm, combining multi-layered technology and SMART scanning (which supposedly scans papers like humans).

3. Some Other Plagiarism Detection Tools

Some other plagiarism detection tools and their website are as follows:

- Glatt Plagiarism Program : http://www.plagiarism.com
- Joint Information Systems Committee (JISC): Electronic Plagiarism Detection
  http://www.jisc.ac.uk/plagiarism/
  Library Electronic Databases: http://gateway.library.uiuc.edu/ersearch/
- The Plagiarism Resource Site: http://www.plagiarism.phys.virginia.edu
- WordCHECK: http://www.wordchecksystems.com/
- Dustball Plagiarism Checker: http://wwwdustball.com/cs/plagiarismchecker/
- CheckForPlagiarism.net: http://www.checkforplagiarism.net/signup.html

4. Open Source Anti-Plagiarism Software

Here is the list of anti-plagiarism software which is freely available in internet to find out plagiarism .Some of them are compatible to the windows based system and others can be checked online. Some anti-plagiarism tools are Web-based and there is no need to download and install the software; some are freeware while others are shareware.

- **Viper:** http://www.scanmyessay.com/. Viper is plagiarism checking software, which have already scanned 10 million resources as claimed in their website. Viper is downloadable freely online for windows.
- **JPlag:** http://www.jplag.de/. Guido Malpohl developed this software which is designed to detect academic dishonesty. The software merely compares the text of documents. JPlag also looks at program language syntax and program structure. So, it can also be used to detect stolen software parts. Instructors

may use JPlag for free, but they must first set up an account in order to prevent unauthorized use by students.

- **Plagiarism detector:** http://www.plagiarism-detector.com/. Plagiarism detector is a free plagiarism detection software, This software is fast and reliable.
- **Plagirisma.Net:** http://plagiarism.net/. Plagiarisma has a search box as well as a software download available for Windows. Users can also search for entire URLs and files in HTML, DOC, DOCX, RTF, TXT, ODT and PDF formats. It can check plagiarism online by simply copy and paste the text in the box.
- **Premium; Copysentry:** http://www.copyscape.com. Preminm:Copysentry is available freely with Sign up requirement.
- **PlagiarismSoftware**.net (formerly Duplichecker): http:/www.duplichecker.com. This is available freely online. This minimalistic checker lets the users search for text and upload TXT files.
- **Moss:** http://www.cs.berkeley.edu/~aiken/moss.html. Moss or Measure of Software Similarity is a tool that has been used primarily to detect plagiarism. The way it works is that it detects similarities of C, C++, Java, Pascal, Ada, ML, LISP or Scheme programs. Moss is free to use for instructors and staff of programming language courses only.
- **Google:** http://www.google.com. Google is not designed to be a plagiarism detection tool, but its advanced search engine capabilities are conducive to locate key phrases that may appear in students' research papers. Some instructors have found it better at detecting plagiarized papers than even Turnitin
- **PlagiarismChecker.com:**http://wwwplagiarismchecker.com/help-teach. plagiarismChecker.com makes it simple for educators to check for copied work by pasting phrases from a student's paper into a search box. The system can search through either Google or Yahoo.Users can also use the "Author" option to check if others have plagiarized their work online.
- **Copyscape:** http://www.copyscape.com/plagiarism-software/ It is also online free plagiarism detecting software
- **Article checker :** http:/www.articlechecker.com Article checker is available freely online.
- **Wcopyfind:** http://plagiarism.bloomfieldmedia.com/z-wordpress/software/wcopyfind/ Wcopyfind is downloadable freely online for windows
- Winsite: http://anti-plagiarism- software.winsite.com/ linux/ Winsite is also downloadable freely online for linux
- Anti-plagiarism. Jnp : http://sourceforge.net/projects/antiplagiarismc/Anti-plagiarism is downloadable freely online for linux

5. Merits of Anti- Plagiarism Software

- Anti- plagiarism software reveals the uniqueness of the report.
- Anti- plagiarism software certifies the work.
- Anti- plagiarism software additionally checks for spelling and grammar mistakes and give correction suggestion. Spelling and grammar check availability helps the students and scholars to give a quality report.
- Anti-plagiarism tools also help in saving time.

6. Drawbacks of Anti- Plagiarism Software

The drawbacks of Anti –plagiarism software are:

- Inability to distinguish correctly cited text from plagiarized text.
- Books are typically not searched by these services.
- Detect plagiarized words, not plagiarized thoughts or ideas.
- Inability to process textual images for similarity checks.

7. How to Avoid Online Plagiarism

- Give the original author's name, title of the work and the source of information if applicable—such as a website address, book or magazine title, PowerPoint deck, etc.
- A surefire way to prevent plagiarism is to ask the author in writing (e-mail is fine) if you can quote from his or her work.
- Avoid quoting from second- or third-hand sources. For example, if you use Wikipedia to learn about hunger in America, don't quote from Wikipedia. Use the online encyclopedia to identify first-hand sources and go directly to them for the information.
- Don't use material from social media without verifying its origin. Use a plagiarism checker. There are software programs and free websites that review documents for plagiarism.
- Use online resources for education. Because unintentional plagiarism has become so prevalent in higher education, many colleges and universities have developed extensive, free websites that provide information on how to avoid plagiarizing.

8. Action to be taken If one's Material is Stolen

If one's work has been plagiarized, we have to address the misuse immediately to avoid further theft of content. Contact the users, taking into consideration that they may have unintentionally plagiarized. Request that they either give credit to the church employee in their writing, link to the original work online, or retract the reproduction. Rarely—but at times—a letter written from the church's attorney might be required for a remedy if the content is unique or potentially has high value (could be used in a book some day, for example), such as a pastor's sermons or writing.

9. Why Plagiarism Detection is Important

In some of the academic enterprises like universities, schools and institutions, plagiarism detection became one of the educational challenges, because most of the students or researchers are cheating when they do the assigned tasks and projects. This is because a lot of resources can be found on the Internet. It is so easy to them to use one of the search engines to search for any topic and to cheat from it without citing the owner of the document. So it is better and must all academic fields they should have to use plagiarism detection soft-wares to stop or to eliminate students cheating, copying and modifying documents when they know that they will be found.

Copyrights and legal aspects for use of published documents also can be covered by using plagiarism software, so it can show whether this person has legally or illegally copied the documents or not and it also show the whether this person has permission from the owner to use this document or not. Plagiarism detection is also one of the most important issues to journals, research center and conferences; they are using advanced plagiarism detection tools to ensure that all the documents have not been plagiarized, and to save the copyrights from violation for the publishers.

10. Conclusion

In India, in absence of database of thesis and dissertations, it is easy to plagiarize them from one to another and even from same university. Plagiarism in project work is common and difficult to detect. For the successful use of plagiarism detection tools, it is very important that project work should be available in electronic form. So, electronic database of thesis and project need to be developed in Indian universities. Now UGC is taking efforts in same direction. UGC have already laid down the condition through its notification (Minimum Standards and Procedure for Award of M.Phil./Ph.D. Degree, Regulation 2009 of dt.01.06.2009) that a soft copy of every M.Phil. and Ph.D. theses is to be submitted to INFLIBNET with the aim of facilitating

open access to it worldwide through ETDs (Electronic Theses and Dissertations) over the internet. This will help in minimizing duplication of research work, containing plagiarism, and ensuring visibility to research work.

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Copyright: *Origin, Growth, Objective, Myths and Reality*

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Abstract

The present study Discuss about the meaning of copyright, concept of originality in a work, emergence of copyright law in India, Main features of copyright law, meaning and definition of literary work, Ownership of a copyright and infringement of Literary work.

Intellectual Property Right; Copyright

1. Introduction

Copyrights are one among the many intellectual property protection granted under Indian law to the creators of original works of authorship such as literary works (including computer programs, tables and compilations including computer databases which may be expressed in words, codes, schemes or in any other form, including a machine readable medium), dramatic, musical and artistic works, cinematographic films and sound recordings.

The protection is granted to the expression rather than the idea itself. It means that there can be multiple works on the same theme or topic but each should have a different original expression. Therefore as there is no protection in the idea of a person there can be different works on the same theme.

2. Concept of Originality in a Work

Explanation to Section 2 states that the term 'literary works' is not confined to works of literature in the commonly understood sense, but must be taken to include all works expressed in writing, no matter whether they have any literary merit or not. Even in cases where the literary merit would be very low, even in such cases copyright protection has be granted, say for example in cases of timetable index, trade catalogues, examination papers, street directories, listing of programmes to be broadcast etc. The copyright law simply mandates that there should be sufficient *"skill, judgment and labour"* in the work that will make the work eligible for a copyright protection. Here it simply means that the work must originate from the author and should not be a copied one. In the words of Peterson J.,

> "The word 'original' does not in this connection mean that the work must be the expression of the original or inventive thought. Copyright Acts are not concerned with the originality of ideas, but with the expression of the idea in print or writing. The originality which is required relates to the expression of the thought. But the Act does not require that the expression must be in original or novel form, but that the work must not be copied from another work – that it should originate from the author."

As earlier stated in addition to an original work created by the author, independent copyright protection can be extended as in case of any other work to the adaptations and abridgements of that work. Anyhow this work is subordinate to the rights in the original work.

3. Emergence of Copyright Law in India

The emergence of Indian Copyright law has been in three phases.

- With the establishment of the British East India Company in 1847 came also the law of copyrights to India. This Act had very different provisions in comparison to today's law.

- The second phase was in 1914, when the Indian legislature under the British Raj enacted the Copyright Act of 1914. It was almost similar to the United Kingdom Copyright Act of 1911. Criminal sanction for infringement was a highlight of the Act. This Act was amended several times till 1957.
- Copyright law which was enacted in 1957 flagged off the third phase. The Copyright Act, 1957 was enacted to include the important provisions of the Berne Convention into the Indian legislation. This Act was enacted by Independent India and is in force till date.

4. Main Features of Copyright Law

- Monopoly Right: The copyright restricts others from using the work that has been the creation of the author.
- Multiple rights: Copyright is not just one right but rather a whole bunch of rights which include right of adaptation, right of reproduction, right of publication, right to make translations, communication to public etc.
- Negative Right: copyright is prohibitory in nature where in others are stopped from copying/reproducing the work.

5. Literary Work

Meaning ad Definition of Literary Work

My area of discussion would be limited to the literary work and its protection. Literary work as defined by Peterson J., reads as "work which is expressed in print or writing, irrespective of the question whether the quality or style is high. The word literary seems to be used in a sense somewhat to the use of the word 'literature' and refers to written or printed matter."

Literary work may include

- Novels, poems, short stories
- Books on any subject
- Computer programmes, tables, computer databases
- Song lyrics

Section 2(o) of the Act 'literary work' is defined as "computer programs, tables and compilations, including computer databases", but it does not set down which works are deemed to be literary.

6. Ownership of a Copyright

We do understand that the author of a work is the first owner of the work. But there can be a few situations in which the work may not be so created. Section 17 of the Indian Copyright Act makes it clear that;

> in the case of a literary, dramatic or artistic work made by the author in the course of his employment by the proprietor of a newspaper, magazine or similar periodical under a contract of service or apprenticeship, for the purpose of publication in a newspaper, magazine or similar periodical, the said proprietor shall, in the absence of any agreement to the contrary, be the first owner of the copyright in the work in so far as the copyright relates to the publication of the work in any newspaper, magazine or similar periodical, or to the reproduction of the work for the purpose of its being so published, but in all other respects the author shall be the first owner of the copyright in the work.

Thus the section implies that when a work is done in the course of ones employment it generally belongs to the employer. There may be a difference when by way of a contract the employees may specifically

state that this is not the case, say for example where a literary work is created by a free-lancer for a publishing house. In the case of government works also the government is the owner of all the literary works created by its employees in the course of their duty. Anyhow when the work is created in one's own free time and not using the resources of the institute that he works in then the employer shall not have any claim on the work so created. A work created after a person's retirement is also considered as the work, authorship of which will go to the creator.

One of such instance that came before the court was in V.T Thomas v. Malayala Manorama, where the question before the court was that whether after the retirement of an employee, in this case the appellant V T Thomas, after termination of his employment of with his employer Malayalam Manorama can claim authorship. In this case Toms was employed by Malayalam Manorama to draw cartoon for its newspaper. Toms created two cartoon characters Boban and Molly and published with Manorma. Anyhow Toms had created the characters even before his employment with Manorama. After his retirement Toms continued to create and publish these cartoons for which Manorama sued Toms. It was held that in the case of termination of the employment, the employee is entitled to the ownership of copyright in the works created subsequently and the former employer cannot claim any rights over it whatsoever. After his termination of employment from Manorama Tom is the author of the work he is free to draw the cartoons and Manorama has no right to restrain him from drawing the cartoon.

7. Infringement of Literary Work

Infringement of copyrighted work is a quite rampant today. It can happen in many ways though one of the simplest ways to do the same is to circulate a copyrighted work on the internet. Here what happens is that a copyrighted work may be scanned and put on the internet for everyone to be downloaded and read. This is similar to the violation that can happen in the hard copy format where a person may take photocopies of a book and then circulate them in the market without the permission of the author. This is a typical scenario of infringement. Infringement vis copying of a literary work can be done in two ways. Either there can be substantial copying which means that the relevant part of the book or the part which is essence of the book has been copied. Or else there can be instance where there is complete copying which is not hard to prove. Minor additions to a copied work will not be of much substance as it would still be considered as a copied work. To take such a work completely out of the ambit of the infringement the changes that have been made to the work should be so substantial that the expression of the work has been made in a totally new way.

There are exceptions to the general rule of copyright infringement. Here though a copyrighted work may be used without the permission of the author still it will not amount to a violation of the copyright law. This happens in situations which have been marked out in Section 52 of the Act. These include

- A fair dealing of the literary work
- Use in educational institutions in certain circumstances
- Reproduction of a part of the literary work in a question paper by the teacher.
- Reproduction in newspapers in certain circumstances
- Use for genuine review of the work, etc.

8. Conclusion

There is a big market of pirated literature today. This kind of piracy has become a major threat for the author of a copyrighted work. It is important that the copyright owner takes appropriate steps for the protection of his work. Law itself provides for may remedies which includes claiming damages or account of profit on the pirated work. Criminal remedy by way of imprisonment can also be invoked. Thus it is always important that as soon as a work is created appropriate legal steps with regards to its registration under the copyright Act is done.

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Impact of Internet on Reading Habits and Use of e-Resources in Digital Age: *A Study*

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Reading of books, journals, magazines and newspapers have a great role to enhance the knowledge of a person. These have been integral part of human learning from long time. However, by the development of technology books and journals have changed their traditional form into the electronic form. The internet has changed the world in an incalculable number of ways. It has changed the way that people communicate, the way that business is done, and the way that information is shared and received. The internet has also had a great effect on student's reading habits, as it has changed the way that people expect to receive both information and entertainment. The present study has been conducted on the students and staff of the UHF, Solan to access the impact of internet use for e-resources on the reading habit. The paper describes the reading culture in electronic age and the impact of e-books and journals on the reading habits of users. It has been concluded that internet has brought drastic change in the reading culture of users and their information needs.



Use of Internet, Internet Impact, Reading Habits

1. Introduction

Reading fires the imagination of the person. It adds new sight to eyes and new wisdom to mind. Reading loads the mind with new software. (Satija, 2002). Reading is an essential tool for lifelong learning. It is important for everyone to develop the rudiments of reading and the culture of reading always so as to survive in life. No one denies the importance of libraries in developing reading habits among students of any level. It is a common view that libraries can play an important role in the academic achievement of the students. Libraries are a source of enhancing knowledge and play a unique role in personality grooming of the students. Libraries are commonly considered essential for educational, social and national progress. The present age is an age of knowledge, and libraries are the storehouses of that knowledge. Knowledge not only helps people to become civilized but also makes their lives easy, prosperous and peaceful as well as trained persons to play their role more effectively for national development. Due to technological development, reading habits are changing. In our society today, while technology is slowly taking a steady control over individual lives, the reading habit is fast vanishing into thin air (The Hindu, 2004). It is believed that computers and the Internet are changing the way people read (Lamb, 2005).

The invention of computer has lead to the revolution of people's literacy world in the21st century. People nowadays tend to rely more on computer-based resources (such as writing emails, sending free e-cards, watching online video, reading online news, transmitting instant messages and photos by Yahoo or MSN messengers, exchanging information in online chat room or discussion area) than paper based resources (such as writing letters, sending cards and postcards, reading newspapers, magazines, novels, and sending pictures by snail mails). Caverly and Peterson (2002, p.291) indicated that, Today, computer technology is integrated into almost every aspect of learning in higher education: textbooks arrive with CD-ROMs; homework is delivered and graded on the World Wide Web (WWW); and assignments are designed to be completed collaboratively through electronic mail. The rapid changes in the information age have resulted in literacy becoming more technological oriented. As Kern (2006) emphasized, computers not only offer instruction, feedback, and testing in grammar, vocabulary, writing, pronunciation, and other dimensions of language and culture learning, but also provide ready access to written, audio, and visual materials as well as references. These new technologies not only influence students' learning and studying in the classroom, but also affect their reading behaviors at home. More recently, libraries are understood as extending beyond the physical walls of a building, by including material accessible by electronic means, and by providing the

assistance of librarians in navigating and analyzing tremendous amounts of knowledge with a variety of digital tools.

2. Reading habits

Reading habits are the intellectual activities for giving more information, knowledge and learn to various types of things and their activities. Reading Habits means behavior which express the lightness of reading of individual, which occur regularly of leisure reading approach, type of reading tastes of reading & use of library services (1). Reading habit is an active skill – based process of constructing meaning and gaining knowledge from oral, visual and written text. (2) Reading habits are the main area of the Librarian and information scientists to know the use of library recourses and services.

3. Factors affecting the Reading Habits

It is difficult to single out a primary factor leading to the establishment of one's attitude toward reading, but environment, particularly the home, probably provides the greatest influence. Because teachers influence students, they have the potential for influencing students' attitudes toward reading. Whether teachers are seen as readers or nonreaders, their attitudes toward reading, and their attitudes toward the students themselves will influence students' reading habits and attitudes. In order to carefully assess their students' attitudes and interests toward reading, teachers should utilize structured observation and interviews; be cautious about judging students because of their sex, reading achievement, home background, or natural origin; remember that their relationship with students is vitally important; read extensively to the students; and encourage students to undertake free reading in their areas of interest.

4. Related literature

The researchers all over the world have discussed the impact of the Internet on reading at theoretical level via opinions and arguments but very few studies are based on the research and experiments. Liu (2005) argues that the nature and purpose of reading seems to deviate from the traditional reading methods, which are brief, linear and less structured. He further observes that people are less engaged in the extensive reading and lack the ability to read deeply in the hypertext environment. Birkerts (1994) observes that the order of the print is linear and the print material is static whereas the Internet surfing is non-linear and interactive and reader is free to read in any direction. He also believes that the younger generation growing up in the digital environment lacks the ability to read deeply and to sustain a prolonged engagement in reading. He further observes that the digital environment tends to encourage people to explore many topics extensively, but at a more superficial level. Elizabeth (2003) observes that the Internet content has blinking graphics, vivid color, and lots of eye-catching phrases that can guide or distract from the reading. Liu (2005) advocates that the screen based reading behavior is characterized by more time on browsing and scanning, keyword spotting, one-time reading and non linear reading; while less time is spent on in-depth reading and concentrated reading. Ramirez (2003) reveals that only 3.7 percent of the respondents do not find it difficult to understand what they read on screen, and 68 percent finds it easy to understand printed text, whereas 24.9 percent understands the contents of both formats: printed and digital. Chartier (2004) believes that reading in front of the computer screen is generally a discontinuous reading process and is done without the identity or coherence of the entire text from which the fragment is extracted.

Dykeman (2008) reports that there is no doubt that the way we read the web pages have a major impact on what we read, how long we read, and how attentively we read when on-line. However, digital reading is capturing an increasingly large slice of total reading time. Liu (2005) advocates that the age factor contributes to the reading behavior on the Internet as the younger people can tolerate more time reading the screen-based materials whereas Broddason (2006) argues that even the younger computer users do not enjoy reading from the screen. Behler (2009) also argues that reading on the computer screen for long periods of time is not most people's cup of tea and leads to hundreds of pages long printouts. Liu (2005) depicts that over 80 percent of the participants always or frequently print out the electronic documents for reading but none of the participants report that they never print out the electronic documents for reading.

Cushman (1986) finds that visual fatigue is significantly higher when reading texts on a screen than on paper. He also believes that e-book technology has a long way to go before it can equal the readability and richness of p-books.

Researchers believe that the Internet has not only affected the reading practices but reading choices as well. The Internet has become the World Bank of information containing information on any field of knowledge. It contains a wide range of information sources from the online versions of print equivalents to born digital sources, image galleries to multimedia reference works, bibliographic indexes to full text databases, plain text to digitized facsimile, primary to tertiary documents, local to global and commercial to open access sources. Lee, Guttenberg and McCrary (2002) reveal that 93 percent of all the newly produced information is being created on a digital format. The digital archives like Amazon, Internet Archive, Google Books, Gutenberg project, Directory of Open Access Journals (DOAJ), Directory of Open Access Repositories (Open DOAR), Directory of open Access Books (DOAB), NetLibrary, Questia, ebrary, and many others provide access to the billions of web pages. The availability of enormous information on varied subjects at one place is supposed to highly affect the reading choices of the Internet users. Loan (2011) reports that the Internet has increased access to information, use of foreign sources, contacts with worldwide readers and time spent on reading, and has decreased dependence on print sources, contacts with print sources, reading in local languages and reading of books.

Kaye and Johnson (2004) affirm that the main aim of users accessing the Internet is to read breaking news and search for up-to-the minute information. Bergstrom (2006) reveals that users have greatly increased the news reading habits due to the Internet surfing. The National Endowment for the Arts, USA (2005) estimates that the number of adults who read no literature increased by more than 17 million between 1992 and 2002. It is also found that 47 percent of American adults read poems, plays or narrative fiction in 2002, a drop of seven percentage points from a decade earlier. Impact of the Internet on reading practices and tastes is widely discussed in both academic as well as non-academic settings but no systematic research has been conducted so far. The present study is a step forward in this direction.

5. Methodology

The present study has been carried out with the help of questionnaire method. A questionnaire has been prepared and distributed among the users of UHF, Library. All the data pertaining to present study has been tabulated, analysed, calculated for final interpretation of reading habits. The study was limited to find the reading habits of users of UHF, Library. The data analysis and interpretation is based on the users from three Colleges i.e. College of Horticulture (COH), College of Forestry (COF) and College of Basic Science (COBS). A study has been made with help of data collected from 188 users of Dr Y S Parmar University of Horticulture and Forestry, Solan for this a questionnaire method has been used to know the users response about different aspects of impact of Internet on reading habits.

6. Data Analysis

Detail of data collected of the Academic faculties and Students of UHF

Table No.1: Number of user's students /staff

Academic Faculties	Staff	Students	Total (%)
College of Horticulture	30	64	**94(50)**
College of Forestry	16	35	**51(27)**
College of Basic Science	18	25	**43(23)**
Total (%)	**64(34)**	**124(66)**	**188(100)**

Study (Table No.1) Questionnaires were distributed to 250 respondents and out of which 188 (75.2%) respondents have responses. COH staff 30 and Students 64 total 94 (50%) were responses, COF staff 16 and Students 35 total 51 (27%) were responses, COBS staff 18 and Students 25 total 43 (23%) were responses.

7. Study on Internet users:

Table No.2: study on internet users

Types of users	No. of Respondents (%)			Total (%)
	COH	COF	COBS	
Staff	30	16	18	**64(34)**
Students	64	35	25	**124(66)**
Total	**94(50)**	**51(27)**	**43(23)**	**188(100)**

Study (Table no.2) on internet users reveals that 50% of COH users are more habitual of internet access whereas COF & COBS constitutes 27% & 23% respectively. The study also implies that the staff users of internet access constitutes 34% & students which is highest i.e. 66%.

8. Gender wise study of staff users on internet use

Table No.3: Gender wise study of users on internet use

Gender wise staff users	No. of Respondents (%)			Total (%)
	COH	COF	COBS	
Male	10	07	08	**25(39)**
Female	20	09	10	**39(61)**
Total	**30(47)**	**16(25)**	**18(28)**	**64(100)**

The gender wise study of staff users on internet use (Table no.3) reveals that the female staff users are more conversant with the use of internet access i.e. 61% whereas the male staff users constitutes 39% of the total staff users.

9. Study on user preference for internet requirement for e-resource information access

Table No.4: Study on user preference for internet requirement for E-resource information access

Types of users	No. of Respondents (%)				Total (%)
	COH	COF	COBS		
			A	NA	
Staff	30	16	18	-	**64(34)**
Students	64	35	20	05	**124(66)**
Total (%)	**94(50)**	**51(27)**	**38(20)**	**05(3)**	**188(100)**

A - Aware NA - Not aware

The study (Table no. 4) on preference for internet requirement for e-resource information access reveals that most of the users of COH, COF, and COBS are well aware with the internet based e-resource information access. COH constitutes 50% & COF and COBS constitutes 27%, 20%r respectively however only 3% of COBS students users are not aware with the internet based e-resource information access.

10. **Study on user's preference for different resources of Reading habit**

Table No.5: Study on user's preference for different resources of Reading habit

Types of users	No. of Respondents (%)						Total (%)
	COH		COF		COBS		
	P/E- Format	E-Format (NP)	P/E- Format	E-Format (NP)	P/E- Format	E-Format (NP)	
Staff	30	-	16	-	18	-	**64(34)**
Students	64	-	35	-	20	5	**124(66)**
Total	**94(50)**	-	**51(27)**	-	**38(20)**	**5(3)**	**188(100)**

P-Print format E-Electronic Format NP-Not Preferred

The study (Table no.5) of preferences for different resources reveals that most of the students users (663%) are habitual of print/e-resource format, however 3% of the students users do not prefer e-resource format. Further the staff users (34%) are also prefers both types of formats of information access.

11. Conclusion

In this digital era there is no time limit for users to access the information from various resources. So due to this, it has also changed the reading habits of users and the preference to study any book or journal at anytime and anywhere. Whenever they want to do some new work and want to know about it, then their curiosity to get more and latest information increases immediately and they go to different sources of information by using internet or i-phones. The study on user's preference for internet requirement for e-resource information access reveals that the student users (66%) are more habitual of Internet than staff users (34%). The female staff users (61%) are frequent user of Internet than male staff users (39%). COH staff and Students (59%) use more e-resources than COF (27%) and COBS (20%). however 3% of the students of COBS not aware about e-resource. COH staff and Students (50%) prefer P/E Format with compare to COF (27%) & COBS (20%). Whereas 3% students of COBS not prefer e-format. The study shows that majority of Staff and Students prefer Print and E-Format both. The effect of the internet on reading habits cannot be ignored as the internet itself becomes more accessible to more users each day. Younger generation students sometimes prefer reading through the Internet or following up book reviews as such opportunities can be thought of as effective means for fostering reading habits. Reading is influenced by many factors like environment, subject, background, age, etc. Libraries are under the influence of modern technologies, which have converted the functional activities in all walks of life.

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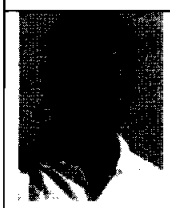
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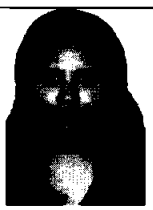
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Legal Information Institute of India - *A Gateway to Access Free Legal Information and Research*

Intekhab Alam



The format of legal information resources has been changed from print to electronic with the advent of information technology and also the approach to disseminate it. The concept of open access emerged as an alternative to subscriptions as a business model for scholarly communication in various subjects including Law. Montreal Declaration was the result of the impact of open access movement on legal scholarly communication. Legal Information Institutes (LIIs) were established to fulfill the objectives of the Free Access to Law Movement (FALM) in many countries and in India also. The paper discusses the role of the National Law Schools played in the formation of Legal Information Institute of India which provides free access to 154 databases including Case Law, Legislation, Journal and Scholarship, Law Reform, Treaties etc. The paper also provides overview of the FALM and Montreal declaration. The paper is descriptive rather to draw any conclusion and suggests measures for the success of open access movement.



Open Access, Free Access to Law Movement, Legal Information Institute of India, Subject Gateway

1. Introduction

Information is the life blood of any system be it mechanical, biological or social (Satija 2013). Law is a social phenomena and "the concept of access to information is essential in a democratic society and core to the rule of law". (Fenton and Anderson 2013). Traditional legal information resources are available in print format and are not easily accessible from everywhere but with the advent of information technology the format has changed from print to electronic and also the approach to disseminate it. Since the mid-1990s the Internet's World-Wide-Web has provided the necessary technical platform to enable free access to computerised legal information. Prior to the web there were many online legal information systems and numerous legal information products distributed on CD-ROM, but there was no significant provision of free access to legal information anywhere in the world (Greenleaf 2008). One of the important contributions of web technology has been the creation of open access archives or repositories containing the full text and data of any published research article, available free of charge to anyone, anywhere in the world (Nazim and Devi 2008).

Open Access has emerged as an alternative to subscriptions as a business model for scholarly journals. Many open access advocates are optimistic that it will enhance scholarly communication by making content broadly available and by providing relief to libraries from continuing large price increases of subscription journals (Lewis 2012). Besides, scholarly publications like other subjects, there are many specific information sources also in law which includes primary sources of law such as legislation, case law and treaties, commentaries on various laws, reports of different committees/ commissions etc. from India as well as rest of the World. The efforts have been started at national, regional and international level individually or collectively to make accessible these legal information resources over the internet free of cost.

2. Legal Information Institutes Worldwide

In many countries the first attempts to exploit the advantages of the web for providing legal information came from the academic sector rather than government, and did so with an explicit ideology of free access provision. Within a few years of the formation of the first legal information institute in 1992, the first group of such organisations became known collectively as "Legal Information Institutes" or "LIIs". Those expressions became synonymous with free access to legal information, though in fact that have a narrower meaning. Two distinguishing characteristics of the "LIIs" are that:

- they publish legal information from more than one source, for free access via the internet, and
- they collaborate with each other through membership of the "Free Access to Law Movement".

Most, but not all, share three other characteristics: technical networks for back-up security purposes; most are independent of government; the majority use one of two open source search engines. Legal Information Institute (or LII) refer to a sub-set of the providers of free access to law, namely those from across the world, who have decided to collaborate both politically and technically (Greenleaf 2010).

3. Free Access to Law Movement (FALM) (www.fatlm.org)

The free access to law movement began in 1992 at Cornell University with the creation of the Cornell Law School Legal information Institute. The name LII has been widely adopted by other projects and is usually prefixed by a country or region identifier. Members of the free access to law movement subscribe to the declaration on free access to law whereby the World Legal Information Institute (WorldLII) is the umbrella project for other LIIs. All legal information institutes are encouraged to participate in regional or global free access to law networks (Phiri 2013). The Declaration on Free Access to Law Movement states that:

- Public legal information from all countries and international institutions is part of the common heritage of humanity. Maximizing access to this information promotes justice and the rule of the law;
- Public legal information is digital common property and should be accessible to all on a non-profit basis and free of charge;
- Organisations such as legal information institutes have the right to publish public legal information and the government bodies that create or control that information should provide access to it so that it can be published by other parties.

The Declaration was first issued by representatives of legal information institutes (LIIs) from eight areas of the world at the 4th International Conference on Law via the Internet, 2002 in Montreal. The Montreal Declaration was issued at a time when other groups were making well-publicized statements regarding the importance of open access to publish scholarly information and research in the science and other disciplines (Danner 2012). The Declaration was amended three times, since its inception, at meetings in Sydney (2003), Paris (2004) and Montreal (2007). There are 53 members of FALM as on December 16, 2013 (FALM 2013).

The movement advocates for those who value free access to law and realise the fact that most countries still do not have effective facilities for free access to law. The free access to law movement, centered on university-based legal information institutes, is assisting and encouraging the development of free access to law facilities in many countries in the developing world. While doing so it is also creating a global network of interconnected free-access legal research facilities on the Internet (Germain 2007).

4. Formation of the LII of India

The Australian Legal Information Institute (AustLII) has been at the forefront in development and collaboration of LIIs since 1995. In 1999 AustLII had its first discussion with a national law school in India (NLSIU, Bangalore) about expanding free access to Indian law in the context of an Asian Development Bank Project (Project DIAL – Developing the Internet for Asian Law). These discussions were taken up again in 2007. The AusAID (Australia's foreign aid agency) granted funding of AUD 275,000 in late 2009 for LII of India. Database development started at AustLII, and the partners held their first meeting in New Delhi in January 2010 and decided to launch new LII in early 2011 (Greenleaf et al. 2012).

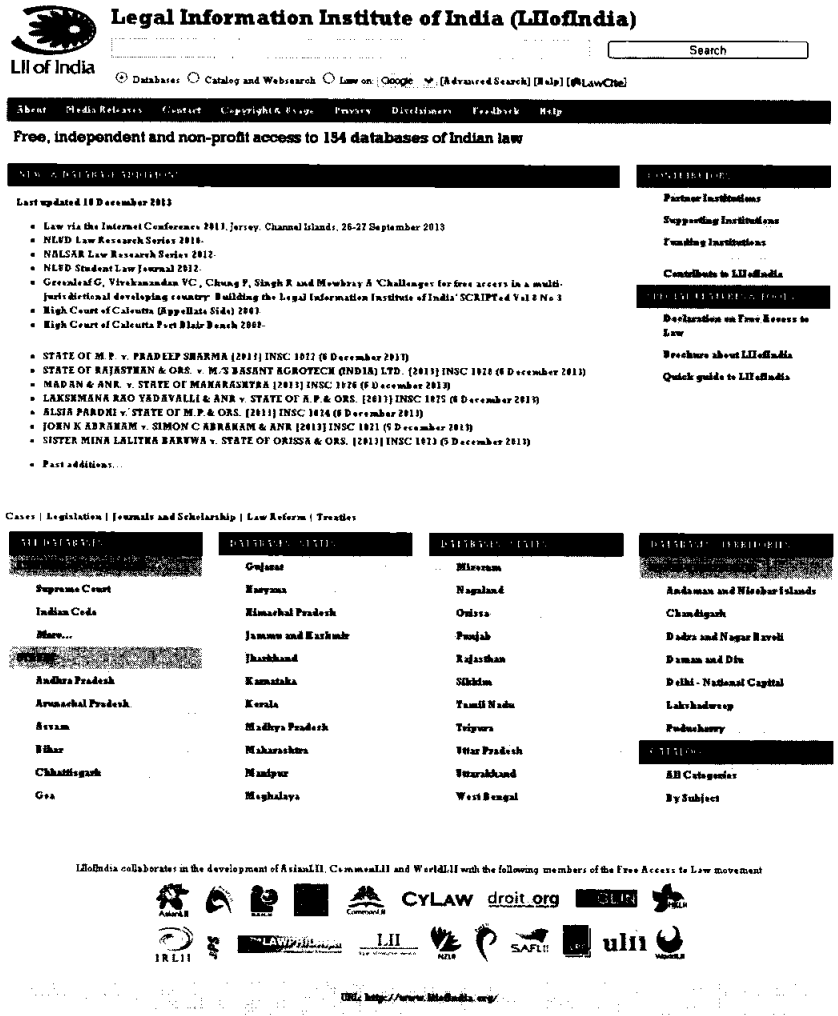
Legal Information Institute of India was inaugurated on 9th March 2011 at Vigyan Bhawan, New Delhi. It has been admitted as 34th member of the Free Access to Law Movement in 2010. LII of India has its

technical and administrative hub at NALSAR University of Law, Hyderabad and other Indian partner institutes are:

- National Law University, New Delhi
- National Law School of India University, Bangalore
- West Bengal National University of Juridical Sciences, Kolkata
- The Tamil Nadu Dr. Ambedkar Law University, Chennai
- Gujrat National Law University, Gandhinagar
- Rajiv Gandhi National Law University, Patiala
- Rajiv Gandhi School of Intellectual Property Law, IIT Kharagpur

5. Present Status of the LII of India

The Legal Information Institute of India is an international standard, free-access and non-profit, comprehensive online collection of Indian legal information. At present, it has 154 databases including Case Law, Legislation, Journal and Scholarship, Law Reform, Treaties etc.



(Home Page of LII of India)

The details of databases are as follows:

- **Case Law :** There are 43 databases of Indian case law in full text which includes Supreme Court cases from 1947; 23 High Courts; 9 District Courts; 6 Central Government Tribunal; 2 virtual databases from CommonLII, one of cases concerning India from the pre-1873 English Reports and the other of cases concerning India in International Courts and Tribunals (LII of India 2013).
- **Legislation :** There are 95 legislation related databases which includes the India Code from 1836; the Constitution; Central Government Bills; Acts from States and Union Territories; Regulations and Schemes from States; Commentaries on Central Government Acts etc (LII of India 2013).
- **Law Reform:** This database includes 80 reports of the Law Commission from 1999 to 2010 (LII of India 2013).
- **Treaties:** Indian treaty series includes 748 Indian bilateral treaties from 1947 to 2009 (LII of India 2013).
- **Journals and Scholarship:** There are 14 databases of law journals and research series, 13 of which are from 5 partner national law schools and one from other institute. The details of Indian Journals and Scholarship available freely on LII of India is given below (LII of India 2013):

Sr. No.	Title of Open Access Journal	Period (Articles)	Publisher	Web-link
1.	NALSAR Law Review	2003 to 2013 (75)	National Academy of Legal Studies & Research University, Hyderabad	
2.	Media Law Review	2010 to 2013 (29)	National Academy of Legal Studies & Research University, Hyderabad	http://liiofindia.org/in/journals/NALSARMLawRw/
3.	Environmental Law & Practice Review	2011 (10)	National Academy of Legal Studies & Research University, Hyderabad	http://liiofindia.org/in/journals/NALSAREnvLawPRw/
4.	The Indian Journal of Law & Economics	2010 (09)	National Academy of Legal Studies & Research University, Hyderabad	http://liiofindia.org/in/journals/INJlLawEcon/
5.	NALSAR Law Research Series	2012 (10)	National Academy of Legal Studies & Research University, Hyderabad	http://liiofindia.org/in/journals/NALSARLRS/
6.	NALSAR Student Law Review	2005 to 2013 (61)	National Academy of Legal Studies & Research University, Hyderabad	http://liiofindia.org/in/journals/NALSARStuLawRw/
7.	Indian Journal of Constitutional Law	2007 to 2010 (44)	National Academy of Legal Studies & Research University, Hyderabad	http://liiofindia.org/in/journals/INJlConLaw/
8.	Indian Journal of Intellectual Property Law	2008 to 2012 (46)	National Academy of Legal Studies & Research University, Hyderabad	http://liiofindia.org/in/journals/INJlIPLaw/
9.	NLUD Student Law Journal	2012 (13)	National Law University, Delhi	http://liiofindia.org/in/journals/NLUDStuLawJl/
10.	NLUD Law Research Series	2010 to 2013 (109)	National Law University, Delhi	http://liiofindia.org/in/journals/NLUDLRS/
11.	GNLU Journal of Law, Development and Politics	2009 (18)	Gujarat National Law University, Gandhinagar	http://liiofindia.org/in/journals/GNLUJlLDP/
12.	Indian Journal of Law & Technology	2005 to 2008 (17)	National Law School of India, Bangalore	http://liiofindia.org/in/journals/INJlLawTech/
13.	NUJS Law Review	2008 to 2009 (72)	The West Bengal National University of Juridical Sciences, Kolkata	http://www.liiofindia.org/in/journals/NUJSLawRw/
14.	Journal of Intellectual Property Rights	2002 to 2010 (324)	National Institute of Science Communication & Information Resources, New Delhi	http://www.liiofindia.org/in/journals/INJlIPR/

6. Conclusion

In India, most of the law schools and departments in universities are public funded and have been established with an objective to advance and disseminate learning and knowledge of law and legal processes for national development. It is the basic duty of these institutions to provide free online access to their scholarly outputs. They should create institutional repositories for thesis and dissertations submitted to the institutions collectively. They should use platform like LII of India for publishing the journals specially students edited law reviews. The e-journals published by the West Bengal National University of Juridical Sciences, Kolkata are available freely at their respective websites but only one is included in the database of LII of India, though it is a member of the LII of India. Besides this many other law institute are publishing law journals and they have not provided full versions on even their own website. Many of the prestigious law journals published by the various public funded institutions are still in printed format only and required subscriptions. Instead of publishing legal scholarship and research in printed format, it is a good time and opportunity to adopt open access publishing model and to participate in free access to law movement.

The Government of India has already started to provide free access to the laws of the land. But there is a need to adopt a uniform citation system for case laws controlled by the courts and it must be the part of the judgement itself, like case number or parties name and must be accepted universally by LIIs as well as private publishers. Argentina have passed Open Access Act (Marzetti 2013) and on the same lines a law is need of the hour in India, to make publicly funded research publications freely available to public not only in law but in other disciplines also.

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License Agreements and Online Access of E-Journals in University Libraries of India: *A Critical Analysis*

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Abstract

This paper analyzes subscription of e-journals and online access site licenses and related policies of foreign publishers. The license agreements are executed by university and other libraries of higher education with foreign publishers. The comparative analysis has been made of licensing policy of some publishers such as Elsevier B.V., Wiley-Blackwell, Macmillan (Nature Publishing Group), Taylor and Francis. Various key features such as pricing policy for subscription and online access of e-journals, subscription fee, back file online access rights with current subscription, and perpetual access rights after termination of license agreement and also legal jurisdiction and application of legal laws in license agreements, have been included and analyzed in detail.

E-journals, License Agreements, Legal Jurisdiction, Pricing, e-subscription, Perpetual Access Rights, Price Cap.

1. Introduction

Electronic journals popularly known as e-journals are those scholarly journals and magazines which can be accessed online on Internet and relevant website or portal of publishers /providers. These e-journals and electronic serials, magazines are regularly published by publishers on web and can be accessed online on Internet. Content wise these are similar to traditional print journals and have peer reviewed research articles. The contents and volumes of electronic journals almost remain similar and match with original print version of the journals.

Wikipedia has also defined to e-journals as scholarly journals and intellectual magazines which can be accessed via electronic transmission. Thus electronic journals can be attributed as periodical publications which are published in electronic format and can be accessed online on Internet.

2. Advantages and Needs of Electronic Journals in University Libraries

Presently the electronic resources have become essential for libraries especially for the university libraries and libraries of other institutions of higher education and research. The ease and comfort which are experienced by users in use of electronic journals has made them popular among the users of libraries of higher education and research.

In short the electronic journals have the following advantages:

1. Users / readers can read the journal contents on their desktop and they do not need to visit the library physically;
2. Articles can be searched at a glance on the required topic and subject from the current issue as well as out of the previous issues of journal(s);
3. Boolean operators can be applied to make the advance search and to find the relevant articles ;
4. Required format HTML or PDF may be used to download the articles. HTML format provides link to other data sources on Internet;
5. Electronic journals can be used in interactive mode and e-mail can be sent to authors and editors.

3. Publishers and Providers of Electronic Journals

The electronic journals are generally published or produced by original publishers. These publishers include the commercial publishers, academies and learned societies, research and development institutions.

Original publishers, vendors and providers, aggregators are also providing online access of electronic journals on Internet. It has been found that original publishers are directly providing online access service for their own journals, sometimes these original publishers get rights form other original publishers for their journals and also provide online access from their own portal. Thus these commercial publishers also acts as service provider for online access for the e-journals of other publishers.

4. Types of Electronic Journals

Mainly two types of electronic journals are available for online access on Internet :

I. **Open Source E- Journal:** These e-journals are free and do not require any singed license agreement with publisher(s) to use them.

II. **Paid / Priced E-Journals:** These journals are available on paid subscription and price is paid to concerned publishers or providers by the university libraries. These e-journals require license agreement which is duly signed by the publishers and university libraries.

5. Need of License Agreements

License agreements are required for online access to subscribe paid / priced e-journals. These license agreements have mutually agreed terms and conditions by university libraries and publishers. The license agreements are prepared by different publishers at their own levels. Different publishers coin different terms and conditions in their license agreements.

Though these license agreements are signed and executed on plain papers but so far these are considered as valid documents by libraries and publishers about the mutually agreed terms and conditions between publishers and university libraries.

6. Essential Aspects and key Features of License Agreements

When we look into the license agreements prepared or coined by the publishers, it is found that these have detailed information contained point wise and stated in clauses. From librarians point of view the following points or clauses need careful examination:

I. **Pricing / E-Subscription Fee:** Generally the price of electronic journals is fixed by the commercial publishers or service providers equivalent to print price of journals. Separate online only price is also fixed by the publishers. Sometimes the additional online access fee is charged by the publishers on the list price. Some publishers decide their prices on the FTE (Full Time Equivalent) basis. In this pricing model total enrolment or strength of staff and students of an institution is counted to quote the price. For an university library in such a pricing model teachers, non teaching staff or research staff and students of university are counted for this purpose. Some publishers such as Macmillan Publishers (Nature Publishing Group), The American Association For The Advancement of Science (AAAS) and some Commercial Publishers also follow such type of pricing models for online subscription of their e-journals.

   On analyzing this type of pricing model it is found that from university libraries point of view this pricing model is not logical because whole population of teachers, students, staff or research staff on campus is counted for fixing the price while staff (teachers, non-teaching staff or research staff, students of all faculties), can not be user of that particular journal for which price is fixed according to this model. In university libraries generally the journals are selected subject wise or teaching department wise, which are used actively by teachers, research scholars and other students related to that particular subject or department which selects the particular journal(s).

   TAX and VAT issue should be taken up with publishers. It must be clearly mentioned that prices should be inclusive of Tax and VAT, Service Tax, if any.

II. Online Access Rights

Generally two types of online access is provided:-

a) Online access based on Login-ID and password;

b) Online access based on IPs of institution.

Presently IP based access is preferred. It gives freedom to the library users to use the electronic journal within the campus where network access is available.

III. **(Archival/Back File Access Rights with Current Subscription:** As a part of the policy publishers provide the back file access rights with current subscription of e-journal(s). These clauses should be carefully examined because usually the publishers have uniform policy for back file access with current subscription but some time they change or amend their policy as per volume of subscription amount of institution and number of e-journals subscription in current year.

IV. **Perpetual Online Access Rights For Subscribed Contents:** Perpetual online access rights of subscribed e-journals, is also an important issue. Generally, publishers provide online access of subscribed contents of previous years, if the subscriber institution remains their subscriber of e-journals in current year.

But publishers have their different policies, if the subscriber institution stops subscription of e-journals and do not remain online subscriber (Terminates License Agreement) then the following options are given by publishers:

V. To get the contents of subscribed e-journals for subscribed years on electronic media either free of charges or on payment of nominal fee as fixed by publisher(s).

VI. To continue the online access of subscribed e-journals by paying fee to the publishers on the basis of down loaded articles in previous year(s).

VII. By Paying a fixed charge for online access as fixed by publisher for subscribed e-journals of previous years, if institution does not continue their online subscription in current year and terminates the license agreement.

The aforesaid options described earlier must be exercised by the libraries very carefully. In case the subscriber institution gets the subscribed contents on electronic media once then, it loses forever the claim or rights for further online access of those subscribed contents.

VIII. **Downloading and Printing of Subscribed Contents:** This clause is also an important aspect of any license agreement for online access of electronic journals.

Usually publishers deny for systematic downloading of subscribed e-journal articles. Some time the limit is fixed for downloading and printing of articles. The limited downloading or printing facility can effect the massive use of e-journals by the users.

IX. **Legal Jurisidiction:** Legal jurisdiction is very important aspect of any license agreement for subscription of electronic journals. This clause related to legal jurisdiction and application of legal laws are included by some publishers in their license agreements. But there are some publishers which may mention in their license agreements reference and application of Copy Right Acts / Laws and Intellectual Property Rights / Laws of their respective countries or they make reference of international intellectual property rights / Laws and do not have reference of legal jurisdictions. For example Elsevier B.V.[2] license agreement has no mention of legal jurisdiction. Very few publishers such as Macmillan Publishers (Nature Publishing Group), Taylor and Francis group make the reference of Governing Laws in their license agreements. Macmillan (Nature Publishing Group) in its license agreement has mentioned clause number 13 as: "The agreement is governed by and construed in accordance with English Laws and parties agree to submit to the exclusive jurisdiction of the English Courts". Similarly Taylor and Francis has included the information about Legal Jurisdiction in their license agreement in clause number 17.10 as: "This license shall be governed by and construed in accordance with English Laws, the parties irrevocably agree that any dispute

arising out of, or in connection with this license will be subject to, and within, the jurisdiction of the courts of England".

In the light of above mentioned facts the matter of Legal Jurisdiction requires serious attention of librarians and other concerned because if any dispute arises between library and publisher then it may cause difficulty before the libraries in India due to legal jurisdiction England and English Laws. The license agreements which do not have clause of legal jurisdiction can also cause difficulty because it will be difficult to decide for libraries where to approach the courts and other legal authorities. It may also be considered that the amount is paid in advance by university libraries to the relevant foreign publishers.

In Indian context it is essential that the license agreements should be amended and libraries in India may insist to add the clause Legal Jurisdiction as India. Moreover, it may also be insisted to apply the Indian Laws.

Table showing comparative analysis of some License Agreements of Publishers (Information is based as available on the relevant websites of publishers)

Key features	Elsevier B.V. (sciencedirect. com)	Wiley-Blackwell (Wiley Online Enhanced License)* (http://olabout. wiley.com)	Taylor and Francis Group (http://www. tandf.co.uk)	Macmillan (Nature Publishing Group) (http://www. nature.com)
Pricing /e-subscription fee	Price based on current year list Price Subscription fee is further divided in two parts as : - Content fee (- %) -Electronic subscription fee (- % discounted)	Online only list Price Price modules are different for e-subscription as: (a) Standard collection (b) Custom collection (c) Online enhanced license (provision of Price Cap)	List Price Subscription is divided mainly as: . Core subscription . Non core subscription (provision of Price Cap)	Price based on: Chargeable users Licensee's full time teaching and research staff and students for (Nature and scientific American). Licensee's scientific department teaching and research staff and students (for other NPG Journals)
Online Access	IP based on campus network or through user name and password or delegated authentication mechanism	IP based on Campus Network	IP based on Campus Network	IP based on Campus network
Archival / back file access with current subscription	Generally 4 years back file access with current year subscription.	Date back to 1997 (online enhanced license) 5 years on individual Journal title e-only subscription	1 January 1997	Four preceding years
Perpetual online access rights for subscribed Journal contents after termination of License	Subscriber institution may acquire and load electronic copy of subscribed titles on its own server. Can continue to access @ 0.81USD per down load based on the number of full text articles downloaded in prior 12 months from such titles	Perpetual access for contents of subscribed years (Enhanced License)	Can continue to provide access to back files via online service. Can also provide back files on digital and electronic copy	Online access on payment of online access fee to be fixed by publisher
Downloading and printing facility	Subscriber can print, download and store a reasonable portion, Substantial and systematic reproduction is not allowed	Downloading and printing is permitted	Limited downloading and printing is permitted	Permit print or download of individual article(s)
Legal Jurisdiction	Nothing is mentioned about legal jurisdiction Clause (1.2) mention section 108 of the U.S. copyright law.	No information about legal jurisdiction is available on website (complete license agreement is not available on website)*	English Laws and within the jurisdiction of the courts of England	Legal Jurisdiction English Courts and English Laws

After analysis of information available on website and License agreements it can be said that the information provided by publishers in license agreement is vague and does not have clarity and publishers have mentioned such clauses in their license agreement which are suited to them. The Elsevier B.V. in its license agreement has no information about legal jurisdiction while clause 6.3 and 6.4 of license agreement have the reference about applicable law. Elsevier B.V. has also not mentioned which law will be applicable.

Regarding price module Wiley-Blackwell[6] in their license agreement policy has given the option of Price Cap and libraries can opt for Price Cap option which is related with future price increase policy of publisher. Moreover, different modules of pricing based on Collection Subscription have been proposed by Wiley-Blackwell in their online access license policy.

Taylor and Francis clause 1.1 has reference of Capped subscription rate and it also has Price Cap provision which is related with annual price increase. Besides, there is no definite policy about perpetual online access rights for subscribed journal contents, if license is terminated by university libraries. The Elsevier B.V. license agreement (Schedule 1.1) to access online earlier subscribed journal contents states that library can use earlier subscribed journal contents if the library remains science direct online subscriber or library has to pay online access fee, if library does not remain online subscriber. In case of termination of license agreement Wiley-Blackwell[9] provides perpetual online access right if library has subscribed journals on Wiley Online Enhanced License subscription module.

Macmillan (Nature Publishing Group) also charges online access fee to access the earlier subscribed contents (Clause 4.6), if library terminates the license agreement. Taylor and Francis in its license agreement has provision of clause number 9.5 for perpetual online access rights for subscribed journal titles but it is not mentioned how long online access of subscribed journal contents will be made available if license is terminated by library.

Thus the subscription of electronic journals in university libraries is an important task. Therefore, before subscription of electronic journals libraries must analyze all options of license agreements proposed by publishers and providers.

7. Suggestions

I. Before signing the license agreements different price modules of publishers should be analyzed thoroughly and better option may be selected by university libraries;

II. Perpetual access rights is an important issue. Incase of termination of license agreement; libraries will not have contents with them out of the subscribed contents if publisher stops the online access. It may also be considered that libraries are discontinuing subscription of print journals, therefore, perpetual online access rights for subscribed contents are becoming essential to provide the service of subscribed journals to users by libraries after termination of license agreement;

III. As discussed above legal Jurisdiction is very important issue. Librarians in India should insist for Legal Jurisdiction as Indian Courts;

IV. Foreign publishers should also review their License agreements and these may be amended as per Indian requirements. It may also be considered that many foreign commercial publishers are having their representatives and offices in India.

V. The license agreements are executed on plain papers while in India such legal agreements are executive on non-judicial stamp papers which have legal validity. Thus the legal aspect of license agreements executed on plain papers requires examination in India from legal point of view.

8. Conclusion

The license agreements are prepared by publishers for e-subscription and online access of e-journals and these are executed by libraries and concerned publishers.

Before executing license agreements with foreign publishers and subscription of e-journals, it is essential that university libraries should make study of their needs and requirements. The university libraries should divide the requirements of e-journals as Core Collection and Non Core Collection. The titles of journals included in Core Collection may be subscribed regularly to get the benefit of pricing etc. as proposed by the different publishers for subscription of electronic journals. The opinion and requirements of faculty and students may also be considered. A policy may be evolved by each university library with the help of teaching departments and faculty for subscription of e-journals in university.

The pricing policy of publishers, back file access rights with current subscription, perpetual online access rights, legal jurisdictions are the key factors which should be given serious consideration before executing any license agreement with foreign publishers by the libraries.

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Plagiarism: A Challenge in the Digital Era

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In academic community some scholars try to publish an article or book by going through a good work published by others. However few succeed and others end with copying the work of others by dumping their originality a. Plagiarism is an issue of great concern amongst the academicians. It is a moral, ethical, and legal issue. Plagiarism has been around for centuries, but the advent of the Internet and easy access to huge amount of written materials on almost every conceivable topic has made the problem more serious. This paper deals with the different aspects of plagiarism like: meaning, reasons, types, and tips for avoiding. The paper also highlights the features of some plagiarism detection software/tools.



Plagiarism, Copyright, Paraphrasing, Plagiarism Detection Software/Tools,

1. Introduction

The growing aggressiveness and competitiveness amongst fellow professionals has affected the growths of many sector like: political system, economic condition, publishing industry, research & development etc. Plagiarism is an issue of great concern amongst the academicians. It is a moral, ethical, and legal issue. The massive increase in plagiarism directly affected the publishing industry, which ranges from a simple article to research work. The availability of textual material in electronic format has made plagiarism easier than ever. Copying and pasting of paragraphs or even entire essays now can be performed with just a few mouse clicks.

Plagiarism often shows up under different names: misappropriation, faulty citation, copyright infringement, intellectual property theft, imitation, cribbing, and stealing, to name a few. Sometimes described as an affront to traditional values of authorship and a threat to long-standing economic values attached to authors .Plagiarism poses a perennial problem for some because it raises a host of questions about ownership, property, convention, law, education, technology, and more broadly the social and ethical codes in defiance of which the plagiarist, as the story usually goes, plagiarizes.

2. Reasons of Plagiarism

Plagiarism has become a root problem in all educational institutes and research centres. Even in other fields of life the issue of plagiarism is increasing rapidly as in the entertainment sector and also in the music. Most people are not aware of the concept of plagiarism which implies any act of copying someone else's work and showing it as their own. There may be many reasons for plagiarism; however below are few important ones:

- Unawareness of Copyrights and IPR.
- Increasing competitiveness.
- Impact of ICT.
- Lack of awareness.
- Lack of communication skills.
- Availability of information on Internet.
- Pressure and deadline to finish the work.
- Lack of command over the language.

- Lack of domain knowledge or experience in the field,
- Taking advantage of the Fair Use option.
- Outsourcing of personal work to third party or person.
- The copied materials were not marked with Copyright note,
- Intentionally or unintentionally few people avoid citing the sources.
- Lack of encouragement for original research work from concerned agencies,
- Lack of interest of the researchers on a specific topic.

3. Plagiarism and Legal Aspects

The following may be considered under this aspect:

- **Creative Commons**: Use and reuse of our own work by others including the creator is very easy through this platform. Based on the necessity, one can change the copyright terms and conditions without any hurdles. One can allow others to copy (partial/full) our own without or with some conditions. Creative Commons and copyrights are not one and the same but work together.
- **Copyright Infringement**: "It is a violation of the exclusive rights of the copyright owner. A copyright is a legal device that gives the creator of literacy, artistic, musical or other creative work the sole right to publish and sell that work. Copyright owners have the right to control the reproduction of their work, including the right to receive payment for their reproduction. An author may grant or sell those rights to others, including publishers or recording companies' .Violation of copyright is called infringement [6]". Copyright infringement and plagiarism are closely related but not the same, which can be seen from the following table.

4. Characteristic features of plagiarism vs copyright violation

Characteristic	Plagiarism	Copyright infringement
Nature	An intellectual dishonesty or moral offence	Legal offence
Who enforces if	Intellectual peers such as senate, professional society, universities, and research organizations	The courts
How to avoid it	Cite the original author	Get the authorization from the copyright owner
Threshold of violation	Very stringent	Reasonable fair use allowed

- **Fare Use**: Use of copyrighted materials without permission of its owner is fair, if it doesn't harm the profit and value of the work. However, one has to ensure that other's work is not being used to gain something.
- **Public Domain**: Works that doesn't have copyright protection may be used freely without the permission of the former copyright owner.
- **Common Knowledge**: Any commonly known and widely established facts may be considered as common knowledge. For example, 15th August 1947 refers to India's Independence Day, which may be viewed as common knowledge. For use of such information, there is no need to give a reference. However, when one uses the language or words or doubtful information or facts of others, you must acknowledge their work by appropriate citation.

5. Types of Plagiarism

The gap between secondary source research and plagiarism is very thin. In the process of research one tends to tread the boundary of original research and walks into plagiarism, sometime unintentionally and many a time intentionally. In intentional plagiarism flagrant copying is done from a source without acknowledgement. This is also known as 'overt plagiarism'. Plagiarism also can be an unintentional or accidental when there is careless omission of citations and failure in using quotation marks or having no knowledge of in which case citing reference is mandatory and how. This should make it obligatory on the part of every researcher to identify the meaning, rules and types of plagiarism. Plagiarism can be in "written form" or "oral form" or even "web based". The different types of plagiarism are discussed below:

- **Written Plagiarism**: There have been cases when the same titled/subject thesis had been carried out at two different places by different people under different guides. This has happened with very well known personalities as well, but in this age of internet and communication such things should be avoided.
- **Word – to-Word Copy**: Use of exact words/phrases//paragraphs/entire article/chapter/book, etc. of someone else's work without permission or proper citation and quotes.
- **Misrepresentation of the Paraphrases**: Paraphrase is a restatement of a text or passage; in other words, it means using different words to express the same meaning as that of original author. Though it makes significant changes in the style and way of presentation of the original, it retains the essential idea or content as it is. Because one is including all of the information from original, the paraphrase is usually about the same length as the original. The misrepresentation of the ideas of the original as well as paraphrasing the ideas without referencing the original source are always measured seriously under plagiarism.
- **Self –plagiarism**: Self plagiarism is nothing but an act of copying material that one has previously produced and again passing it off as a new production. This is very common and most of the researchers feel since it's their own writing they can reproduce it any number of times.
- **Outsourcing**: Get the work done by someone else for free or on payment.
- **The Potluck Paper**: The writer tries to copy from several different sources and after modification the sentences makes them fit together retaining most of the original terminology in his writing. This is nothing but a potluck paper.
- **Translated Plagiarism**: Many translate the original material into some other language and pass it as their own work without disclosing the name of the original work.

6. **Oral Plagiarism**: Oral plagiarism takes place while giving speech, group discussions, presentation at seminars and viva-voce. To avoid the charge of plagiarism, the speaker should make clear what is his own and what is borrowed. The speaker should give credit not only for direct quotations, but also for ideas which have been borrowed.

- **Internet Plagiarism**: Plagiarism had never been easier than it is today. Before widespread access to the internet, cheating was laborious, as plagiarists had to find appropriate works from a limited pool of resources available in nearby library and copy them by hand. Since these resources were almost always professionally written, the risk of detection was very high. The internet made it easy to find thousands of relevant sources in seconds, and in a few minutes a plagiarist can find, copy, and paste together an entire paper or essay. File transfer programs make it easy to trade copyrighted files, which most people would never think to steal in physical form. In other words, the internet makes plagiarism easy for students who might have thought twice about copying from a book or published article. Many wonderfully prepared slides and illustrations are simply downloaded from the internet and displayed at seminars through PowerPoint presentations. This is nothing but plagiarism as no credit is given to the site from which these are downloaded and from whose writings they are derived.

There are different ways through which internet plagiarism can be decreased but it cannot be eliminated. Search engines are also being used for catching plagiarism but there are limitations. There are many website which provide material with some restrictions like proper registration and downloading charges.

7. Tips for avoiding Plagiarism

Following are the important tips, which will help us to reduce the percentage of plagiarism and produce the original work:

- The best practice is to cite the original source ,
- Paraphrased information and direct quotations must always be cited.
- Good writing skills.
- Sound domain knowledge.
- Avoid machine /software translation.
- Appropriate study of selected field.
- Put the copied text in quotation ("---") marks.
- Better understanding of copyrights,
- Avoid changing or rearranging the words of others
- Avoid outsourcing of work.
- Proper funding/incentive and encouragement for original research work.

8. Plagiarism Detection Software/Tools

Plagiarism detection is the process of locating instances of plagiarism within a work or document. The widespread use of computers and the advent of the Internet have made it easier to plagiarize the work of others. Most cases of plagiarism are found in academia, where documents are typically essays or reports. However, plagiarism can be found in virtually any field, including scientific papers, art designs, and source code.

Detection of plagiarism can be either manual or software-assisted. Manual detection requires substantial effort and excellent memory, and is impractical in cases where too many documents must be compared, or original documents are not available for comparison. Software-assisted detection allows vast collections of documents to be compared to each other, making successful detection much more likely.

In some of the academic enterprises like universities, schools and institutions, plagiarism detection and prevention became one of the educational challenges, because most of the students or researchers are cheating when they do the assigned tasks and projects. This is because a lot of resources can be found on the internet. It is so easy to them to use one of the search engines to search for any topic and to cheat from it without citing the owner of the document. So it is better and must all academic fields they should have to use plagiarism detection soft-wares to stop or to eliminate students cheating, copying and modifying documents when they know that they will be found. Some types of plagiarism acts can be detected easily by using some of the recent plagiarism detection soft-wares available on the market or over the internet. However for some of the expert plagiarism who is using some of the anti-plagiarism soft-wares which are available over the internet, it needs more efforts to detect the plagiarism or cannot be detected at all.

There is a big number of plagiarism soft-wares used for plagiarism detection and many of detection tools have been developed by researchers but still they have some limitations as they cannot prove or they show evidence that the documents has been plagiarized from another document or sources it only shows been published globally in some international journal, but some of universities and some of the research centers still do not taking any action against plagiarism detection which help people to cheat more and more. So still now by using the recent detection software, plagiarism can not 100% be detected.

Copyrights and legal aspects for use of published documents also can be covered by using plagiarism software, so it can show whether this person has legally or illegally copied the documents or not and it also show the whether this person has permission from the owner to use this document or not. Plagiarism detection is also one of the most important issues to journals, research center and conferences; they are using advanced plagiarism detection tools to ensure that all the documents have not been plagiarized, and to save the copyrights from violation for the publishers.

There are number of plagiarism detection software available either freely or commercially, which can be used for plagiarism detection. The following table gives an overview.

S.n.	Name	Features/techniques	Pros/cons
01	**Copycatch** http://www.copycatch.freeserve.co.uk/vocalyse.htm	A UK system which concentrates on comparison within a group of students. The software compares text from work collected by email or on disk using a similarity threshold that will detect essays which are very similar or dissimilar to other class essays by communality of words and phrases.	**PROS:** The JISC (Joint Information Systems Committee - HEFCE-funded UK organization) gave this software five stars for detection, clarity, value, user-friendliness, speed and reliability. **CONS:** Detects only collusion among students, and cannot detect material downloaded from the Web
02	**Glatt Plagiarism Screening Program (GPSP)** http://www.plagiarism.com/INDEX.HTM	Uses the 'fingerprint' method. It exploits the uniqueness of each individual's linguistic patterns - 'cloze' technique. It eliminates every fifth word of a student's paper and replaces the words with a blank which the student is asked to fill in. The number of correct responses is one of the factors considered in the production of a final probability score.	**PROS:** Useful for detecting plagiarism where the original source material cannot be located. **CONS:** Students actually have to sit down to a test to fulfil the requirements.
03	**Turnitin.com** is the user portal for Plagiarism.org. http://www.turnitin.com/	The technology used is called 'document source analysis'. It uses a set of algorithms to make a digital fingerprint of any text document, and then compares it against Internet sources and against an in-house database. Results are compiled into an 'originality report' which colour-codes and underlines text passages showing similarities to other sources, and gives the URLs of the sources.	**PROS:** Covers a huge range of sources. Offers a digital portfolio service. in which students' work is archived. **CONS:** The user has to check the report carefully because the software detects correctly-cited material as well as plagiarised material. As in similar programs, formatting is lost in the checking procedure, so essays for marking have to be submitted separately from essays for checking.
04	**EVE2 - Essay Verification Engine** http://www.canexus.com/eve/index.shtml	Performs searches to find Internet sites with similarities to the submitted text. Produces report underlining text passages possibly plagiarised.	**PROS:** Tests against wide area of internet. **CONS:** Each piece of work has to be individually loaded and checked by the lecturer.
05	**Plagiserve** http://www.plagiserve.com/	A system which checks the originality of reports by comparing students' work with its own database and the internet. It provides an originality report that colour codes possibly plagiarised passages and provides direct links to the original source.	**PROS:** Tests against extensive in-house database and internet searches **CONS:** Formatting is lost during the checking process, so material has to be handed in separately. Has been claimed to be associated with cheat sites.

S.n.	Name	Features/techniques	Pros/cons
06	**WordCHECK DP** http://www.wordcheck systems.com/word check-dp.html	Software which profiles documents by identifying key word use, allowing users to search manually for matching documents based upon word use and frequency patterns. Uses an internal database. Produces report with key-word profiles and word frequency lists.	**PROS:** Similar system to Copy catch. **CONS:** Uses only internal database. Manual checking of each piece of work is very time-consuming
07	**WordCHECK RA** http://www.wordcheck systems.com/word check-ra.html	An upmarket package which is aimed at academic research rather than student assignments. Works on the same principles as the DP version.	**PROS:** As for the DP version. **CONS:** As for the DP version
08	**Moss** http://www.cs.berkeley.edu /~aikenn/moss/html	MOSS is an acronym for Measure of Software Similarity - an internal system at Berkeley developed specifically for computer programming fields.	**PROS:** Designed with a special focus on computer programming code rather than text. **CONS:** Limited in scope.
09	**SIM** http://www.cs.vu.nl /~dick/sim.html and http://www.cs.vu.nl /pub/dick/s imilarity tester/	Another computer code plagiarism detector. SIM tests lexical similarity in a number of languages including Java, Pascal, Lisp, and Miranda. It detects potentially duplicated code fragments in software projects.	**PROS:** As for Moss **CONS:** As for Moss
10	**JPlag** http://wwwipd.ira.uk a.de:2222/	System that finds similarities among multiple sets of source code files. Designed for detecting plagiarism in computer programming but can support plain text as well (although with less satisfactory results).	**PROS:** The only software that can deal with programming-type work as well as ordinary text. **CONS:** Limited and less effective in its use with ordinary text.
11	**Google** http://www.google.com	Primarily a search engine and not a plagiarism detector, Google is nevertheless able to detect phrases and can rapidly identify source material from the Internet.	**PROS:** Quick and free. Google extracts from pdf files, which many search engines cannot do. **CONS:** Unsystematic, and involves manual entry of strings. Labour-intensive.

9. Conclusion

Plagiarism has become part and parcel of our life in the present digital era. As a result many individuals and organisations are wasting their valuable time and money on plagiarism detection. There may be many reasons for plagiarism and on the other hand almost equal numbers of ways are available to prevent it. Plagiarism is a crime. However, unintentional plagiarism is to be taken on another level. With the development of web based resources, plagiarism detection is now as easy as plagiarizing a document. Most of the cases of plagiarism are the result of lack of awareness about the copyright rules and the ethics related to the use of information. Proper information literacy training is essential to change the situation Plagiarism, however, is to be detected and discouraged at all levels. Making the information users aware about the judicious use of information and pattern of acknowledging even at the stage of learning is essential. The awareness about the plagiarism detection tools will help to avoid plagiarism to a great extent

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Plagiarism Detection Software: A Comparative Study

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Abstract

In recent years the academic and scholastic community has significantly depended on the Web for information. The accessibility of immense measure of information on the web and its openness to all has made individual to exploit the information without giving credit to original creator. Thus the prevention of the plagiarism is the requirement of great importance. In this context the paper discusses the possible ways to avoid the plagiarism. It also compares the characteristic features of plagiarism detection software freely available on the web.

Plagiarism, Detection software

1. Introduction

Michael Conners pointed out that "academics who once praised the Internet for giving students more access to information are now worried it is providing students with easy access to pre-written essays" (Conners, 1996). Prominence and openness to immense data over the web on one hand and the unawareness of individuals included in academic work has made assurance for the intellectual property inevitable. In present day times, freely accessible information from the wealthy web prompts the plagiarism. Plagiarism, hence, is a raising issue in the academic world.

2. How to avoid possible plagiarism?

Here are some of tips to avoid the possible plagiarism which will more helpful to the academics as well as researchers (http://en.writecheck.com/ways-to-avoid-plagiarism)

- **Paraphrase:** If the research papers contain information that is more useful to your research work, then read it and put it into your own words. Make sure that you do not copy verbatim more than two words in a row from the text you have found. If you do use more than two words together, you will have to use quotation marks.
- **Cite:** Citing is one of the effective ways to avoid plagiarism. Follow the document formatting guidelines (i.e. APA, MLA, Chicago, etc.). This usually entails the addition of the author(s) and the date of the publication or similar information.
- **Quoting:** When quoting a source, use the quote exactly the way it appears. No one wants to be misquoted. This process takes time, but quoting must be done correctly to avoid plagiarism allegations.
- **Citing Quotes:** Citing a quote can be different than citing paraphrased material. This practice usually involves the addition of a page number, or a paragraph number in the case of web content.
- **Citing Your Own Material:** If some of the material you are using for your research paper was used by you in your current class, a previous one, or anywhere else you must cite yourself. Treat the text the same as you would if someone else wrote it. It may sound odd, but using material you have used before is called self-plagiarism, and it is not acceptable.
- **Referencing:** One of the most important ways to avoid plagiarism is including a reference page or page of works cited at the end of your research paper. Again, this page must meet the document formatting guidelines used by your educational institution. This information is very specific and includes the author(s), date of publication, title, and source.

3. Plagiarism Detection software

Since the innovation methodologies to plagiarism detection have kept tabs on location, the utilization and access to them has risen. Use of plagiarism detection software which are accessible online has strong now because people are more open to the web (Kulathuramaiyer and Maurer, 2007). Numerous online counterfeiting checking software are accessible online to detect the appropriated content. Table 1 discusses few common features of online plagiarism detection software.

4. Features of plagiarism checking software

- **Text box search:** This characteristic permits the client to enter a passage of content in the text box that is to be checked. A click on "check" might give results
- **File upload:** Whole file that must be checked could be transferred here for plagiarism check
- **Result line by line:** The software would display the sentence by sentence that might be plagiarized
- **Online result display:** The results need not to be downloaded; it would be displayed on the screen
- **Free check:** Few software tools provide free unlimited search options whereas, few demands for registration and even payment after free checks.
- **Grammar check:** This feature allows one to search the error in the grammar of the text along with plagiarism check. It could be an advantage to the scholarly work.
- **Check URL:** Few software permit users to paste the URL of a site. The software then checks for the site content that is continuously utilized by different sources and showcases the consequence on the screen
- **Check different file formats:** User can check the text for plagiarism which are in different file formats such as DOC, PPT, XLS and HTML
- **Check by search engine:** Few plagiarism detection software allow user to select the search engine which retrieves the abused content.
- **Registration required:** After few checks the software asks for user registration.

Table 1: Comparative Features of plagiarism detection checking software

Software	Text box	File upload	Check result line by line	Online result display	Free check	Grammar checking	Check URL	Check different file formats	Check by Search engine	Reg istration required
Plagiarism Software	Yes	Yes	Yes	Yes	Unlimi ted	Yes	No	No	No	No
Plagiarism Detector	Yes	Yes	Yes	Yes	Limited	No	No	No	No	Yes
Plagiarism checker.com	Yes	No	No	Yes	Limited	No	Yes	No	No	No
The Plagiarism Checker	Yes	Yes	Yes	Yes	Limited	No	Yes	Yes	No	Yes
Plagiarisma. net	Yes	Yes	Yes	Yes	Limited	No	Yes	Yes	No	Yes
Small SEO Tools- Plagiarism Checker	Yes	No	Yes	Yes	Unlimi ted	No	No	No	No	No
Plagium	Yes	No	No	Yes	Unlimi ted	No	Yes	No	No	Yes
Plagiarism Software	Yes	Yes	Yes	Yes	Unlimi ted	No	No	No	No	No
Grammarly- Best Grammar and Plagiarism Checker	Yes	No	Yes	Yes	Limited	Yes	No	No	No	Yes

5. Conclusion

The concept of plagiarism has turned into a severe hurdle for the scholarly world. It debilitates the scholastic world by misusing the literary and artistic work. Mistreatment and false use of information ought to be stayed away from. Numerous technological apparatuses and systems are accessible to control literary theft. Location of plagiarism is simple, however to regulating is greatly challenging. Best way to control plagiarism is making consciousness around the scholarly and academic group. Controlling plagiarism ensure innovations and novelty in the scholarly work (Kulathuramaiyer and Maurer, 2007).

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Understanding, Detecting & Preventing Plagiarism: *Effective Tools & Measures*

Rupak Chakravarty **Preeti Mahajan**



This paper presents a brief conceptual analysis of plagiarism along with information on some of the free and commercial online plagiarism detection tools/softwares. Special mention has been given to Turnitin.com as the Panjab University (the university to which the authors are affiliated to) has subscribed to this database for prevention and detection of PhD theses being submitted by the research scholars of the university. The feature OriginilatyCheck of this database has been discussed with the help of illustrations. The authors observe and maintain that the approach of detect-and-punish in tackling the problem of plagiarism. Instead a more wholistic and holistic approach has to be adopted based on the philosophy of awareness/early intervention is better than cure/penalty.



Plagiarism, Academic dishonesty, Copyright infringement, Digital Millennium Copyright Act, Ethical Behavior.

1. Introduction

Plagiarism is defined as the reproduction of ideas and/or language from the source materials without adequately acknowledging the original source. It involves the act of presenting someone else's words or ideas or creative expressions as your own intentionally or unintentionally. It may involve copying others' text or copying one's own publication as well. In the latter case, it is defined as self-plagiarism or the duplication of one's own publication.

The practice continues at the graduate, post graduate and the research level, where the students as well the researchers either copy the contents from the earlier published literature or the Internet where a sea of information in the form of term papers, search engines, online journals, etc. is easily accessible. The Internet has made it easier as well as faster. In fact, apart from the academic circles, it is now also common in other areas including journalism, fashion, arts as well. During the 2008 federal election campaign, it was revealed that a speech given by Stephen Harper in 2003 had been plagiarized from a speech given by the Australian prime minister. In 2007, Australian television presenter David Koch was also accused of plagiarism.

2. Plagiarism: Causes and Measures

In order to deal with the issue of plagiarism, it is essential to understand the factors which make it happen. Many factors can trigger plagiarism: pressure, disorganization, poor study habits, our "cut-and-paste" culture, or a lack of understanding on the seriousness of plagiarism. The academicians often complain that the students do know that plagiarizing is wrong but they do not realize that they are actually committing it. Plagiarism in higher education is a growing problem. Research findings indicate that the issue of plagiarism has taken the shape of an epidemic and a majority of students are engaged in the act of plagiarism either knowingly or unknowingly during their studies. Factors such as time constraints may lead to deliberate cheating. Yet, the trend may also have arisen inadvertently due to a lack of understanding as to what plagiarism is, poor training in citation skills, poor academic skills, or an inability to paraphrase appropriately. Furthermore, students using English as a second/foreign language face additional challenges, often having to sort out the ambiguities of acceptability in recycling of language while at the same time still struggling to develop competency in grammar and vocabulary.

University of Alberta Library Guide to Plagiarism has discussed reasons of plagiarism very comprehensively. A summary of the discussion is given below:

	Categories	Factors
I	Poor Writing and Research Skills	Lack of search skills Problems evaluating Internet sources Confusion between plagiarism and paraphrasing Confusion about terminology Careless note taking Confusion about how to properly cite sources
II	Misunderstanding Key Concepts	Misconception of plagiarism Misconception of intellectual property, copyright, and public domain Misconception of common knowledge Perception of online information as public knowledge
III	External Factors	Pressure from family, competition for scholarships and jobs. Student ethics Commoditization of knowledge and education-Internal Factors.
IV	Internal Factors	Poor time management and planning skills

To avoid such acts of plagiarism, it becomes imperative to rephrase or paraphrase the original version and simultaneously acknowledge the source using any standard citation style. In other words, one should integrate and interpret different sources in one's own words. This process involves not only reproducing and extending ideas, but also reflecting upon and reiterating their meanings. Some simple measures which can be adopted to avoid plagiarism include use of quality literature, understand the concepts with clarity by inculcating good reading habit with comprehension ability, use quotation marks for the exact words of the source, express the ideas in a passage in your own words through paraphrasing, consult the guide, use appropriate citation style and most important is awareness regarding plagiarism to eliminate it from root.

3. Awareness

It is rightly said that prevention is better than cure. Prevention in the form of awareness about the concept of plagiarism is very crucial from the early ages of the students as the foundation of their attitude and aptitude towards the work to be undertaken by them is laid during their school days. Often, the students are not only aware of the fact that they are plagiarizing, they are also not aware of its seriousness and possible consequences. Plagiarizing by the students may also be due to poor research skills, poor time-management, etc. They are often not aware as to how to cite the source properly. If they are not sensitized and made aware of the pros and cons of plagiarism and if it remains undetected, the students will take it for granted and the habit of copying will continue throughout their lives. Moreover, it will become very difficult to stop them from plagiarism at a later stage of life. Hence, the teachers or the guides must inform them that any case of plagiarism will result in immediate rejection of the paper and possibly expulsion. They should be encouraged to visit libraries and consult recent printed sources to complete their tasks as it will lessen the chance of blind copying from the Internet. They must be informed about the proper citations. They must be informed that if a source is very important for their work, it must be cited properly or at least some parenthetical reference, footnote or endnote must be given. They should also be encouraged to be as concise as possible, focusing on the main theme while writing. Carroll and Appleton (2001) have given the following suggestions:

- Creation of new assessment tasks each time.
- Avoiding assessment tasks that only require students to collect and explain information which is available on-line easily.
- Creation of assessments requiring analysis, evaluation and synthesis.
- Design tasks with multiple solutions along with justifications.
- Informing students about plagiarism in a student-friendly language.
- Dealing with plagiarism formally.

- Using plagiarism detection tools available online.
- Signed declarations of originality

However, most of the cases of plagiarism can be avoided simply by acknowledging the original source thereby stating that certain material has been borrowed and providing the link to the users so that they can easily access the original source for further clarification.

4. Plagiarism detection softwares

Before the onset of the Internet and other IT related tools, plagiarism was not that easy as the user had to do a lot of labour to copy the content. Moreover, to find out how much has been copied manually, huge effort was needed and it became almost impractical as a limited number of documents could be scanned for comparison. However, with the coming up of the Internet where a lot of content is freely available in the public domain, it is being noted that the content is being freely copied and pasted (i.e., plagiarized). It is often said that the solution of a problem always lies near the problem. For detecting plagiarism, various plagiarism softwares as well as web based tools have also been devised for assessing the level of plagiarism by the authors. Software-assisted detection allows vast collection of documents to be compared to each other, making the process of detection easy and more accurate. Computer-assisted plagiarism detection (CaPD) is an Information retrieval (IR) task supported by specialized IR systems, referred to as plagiarism detection systems (PDS). Some of them are available for free and some are paid. While the free softwares have the limitations that they rely solely upon web search engines like Google, Yahoo, Bing, etc. to examine the content, the paid softwares are backed by subscribed databases from reputed global publishers. Some of such softwares are described below:

4.1 Free/Open Source:

- **Open-Access Plagiarism Search (OAPS):** Open-Access Plagiarism Search (OAPS), which was started (beta version) in February 2011, aims for the detection and avoidance of text plagiarism in education and research. It enables to detect similarities between given text documents and available Open-Access documents. The plagiarism search is based on the OAPS Search Index that currently contains nearly 12 million documents. To use the OAPS service, a user account has to be crated and scan can be performed after log-in on this websites. When logged in, one can submit text documents to OAPS and start the plagiarism check. Afterwards, the result of the check is available as a plagiarism report in the user account. As OAPS is currently in a beta phase, errors cannot always be avoided. In the beta phase of the OAPS service, the applicability of generated plagiarism reports may be limited due to the current size of the OAPS Search Index, especially if no results are found. However, this will be changed in a later phase of the project. However, OAPS has not guaranteed the permanent availability of the service.
- **Crossrefme:** It mines through millions of web pages to check if the content has already been published or not on the Internet. The content is copied and pasted in the text box and the results page displays multiple links from where the content is copied from, along with the percentage of similarity between both the versions. This service could be used to determine whether a given text has been correctly referenced, how original the text is, whether the text has been properly attributed, etc.
- **Dupli Checker:** It is a free online plagiarism checking tool which has been designed by a team of professionally proficient developers to ensure 100% authentic results through dissection of each sentence individually utilizing authentic data sources. In Dupli Checker, the users can choose between the classic and advanced duplicate detection options. In the classic option, individual results are shown for each and every sentence. In the advanced search, most relevant duplication links are listed. It analyzes each sentence entered in the text box. The text can be entered either ways- copy-paste the text into the text box, enter the URL of the content destination required to be checked, or upload a text file. As a free service it allows a maximum of 1500 words as word limit per search.

- **Plagiarism Checker:** PlagiarismChecker.com, developed by Darren Hom, searches for several phrases from a student's paper at the same time without having to type quotation marks or special operators. It checks the submitted source for direct plagiarism by splitting it into fragments. Then, using the search engine's API (official method), it checks from Google, Google Scholar abstracts and Bing for appearance of these fragments. One can either enter text, URL or the text file and it then scans the entire document. It is free and works on any papers. It automatically adds the quotation marks and special operators.

- **Viper - the Anti-plagiarism Scanner:** Viper is free software and is used by academicians and students worldwide to detect plagiarism in academic works. A student can download and use the software to find any missed reference or incorrectly cited sentence. An academician can use the software to find out if a student has plagiarized from the Internet or copied from somewhere else. It scans over 10 billion resources which are constantly being updated daily, has an easy-to-use interface and highlights the areas of plagiarism. It offers side-by-side highlighted comparison through an easy to use step-by-step process to avoid accidental plagiarism. This also enables matching to offline content, since students' papers often contain direct quotes from print sources as well. Results are fast and a comprehensive report displays findings in a side-by-side format with the source material showing. Viper has a lot of powerful features which include allowing multiple resubmissions, supporting multiple document types and facilitating scanning longer documents such as dissertations for plagiarism. When user scans an essay, it is added to their database so that future scans can be compared to it. But in exchange for access to the scanner, the paper is automatically uploaded/published on one of their study sites to allow other students to use it as an example of how to write a good essay. Viper maintains that unlike other free plagiarism softwares, it does not sell or misuse the original work in exchange for the free access.

- **Plagium:** Plagium is a an online plagiarism detection service which focuses on the development of innovative information search solutions for consumers, enterprises, government, academics, and healthcare. It employs advanced search technology for deep mining of documents on the pubic World Wide Web or within private repositories. Plagium intelligently breaks up the input text into smaller "snippets" which are matched against web content to determine what documents match the input text. As a free user one can scan upto to 25,000 characters per search.

4.2 Commercial:

- **Turnitin.com:** Turnitin is an online plagiarism detection (text-matching) tool which is emerging as the global leader in evaluating and improving student writing. It has tie ups with leading content publishers, including library databases, text-book publishers, digital reference collections, subscription-based publications, homework helper sites and books. These partnerships have contributed over 110 million additional articles to our databases. It is used by more than 10,000 institutions in 126 countries to manage the submission, tracking and evaluation of student papers online. It compares a submitted document against a vast electronic database of billions of websites, millions of periodicals, books, and archives of assignments and documents previously submitted to Turnitin from all over the world. It produces an "originality report" for each submitted document that highlights matched texts using color coding and links to what it deems to be the original source of the match in its database. The text-matching system gives an overall plagiarism score (similarity score) from 0% (being completely original) to 100% (being completely matched). Low percentage reports can be excluded through a filtering system on Turnitin. By using the "side-by-side" feature, with the submitted document on the left and the similar text on the right, the process of comparison is made easy. It can help students assess the originality of their own work, offer awareness of plagiarism, and prevent them from copying content from the Internet sources without appropriate acknowledgment.

  It provides various features which include OriginalityCheck, GradeMark, PeerMark, iPad, Integrations, etc. OriginalityCheck, which is the commonly used feature of turnitin, compares the paper's text to a vast database of 40+ billion pages of digital content (including archived Internet

content that is no longer available), over 300 million papers in the student archive, and 120,000+ professional, academic and commercial journals and publications. The software is regularly updated with new content acquired through new partnerships. Turnitin offers institutions a wide variety of flexible options for handling students' submissions including options that let students choose to keep their papers in an institution-only private zone. Panjab University which is one of the subscribers of the Turnitin database has made it mandatory for these being submitted by research scholars to be scanned by the software prior to final submission.

5. Final Thoughts:

It has been observed that plagiarism is spreading like an epidemic throughout the world. All the academic institutions are quite worried about the increasing level of plagiarism and have resorted to use of plagiarism software tools. For example, Panjab University (PU), Chandigarh (which has 13th rank as per the Times Higher Education (THE) in its BRICS & Emerging Economies Rankings 2014, and is the highest ranked Indian institution clubbed in the group of universities between 226-250 ranks) has subscribed to the Turnitin database. It has decided to use the software with the aim to create awareness, train and sensitize the students and researchers on the issues of plagiarism rather than waiting for them to make mistakes and then penalize them later with originality/similarity report generated by the software. The emphasis is on prevention rather than punishment.

It is high time that the librarians, teachers, researchers as well as students should come forward to stop plagiarism. The most important role in this should be of the teachers who should inform the students and the researchers as to how to come out of this copy-paste culture. They must inform them as to how to cite the sources properly with due acknowledgement to the original author, thus avoiding plagiarism. Higher education institutions and R&D organizations should conduct workshops and training programmes to create awareness about plagiarism. Such an approach will certainly ensure both prevention and cure of plagiarism. The time has come that something concrete is done to address the issue of plagiarism before the status or reputation of a person, institution as well as the country is defamed by cases of plagiarism.

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A Decade of Contribution to Open Access Movement: *An Analytical Study of DOAJ*

Gupta, P M et. al



ICT and Open Access publishing are playing key role in providing universal access to the information and knowledge to the privileged and under-privileged communities .The Directory of Open Access Journals (DOAJ) has been at the heart of the open access movement since last 10 years , DOAJ has completed 10 years of its journey in 2013. DOAJ is recognized as most accepted and authoritative list of Scholarly, Peer-reviewed, and full text open access journals in this period of a decade after its inception. This study aims to analyze the contribution of DOAJ in Open access to the scholarly publication in all the subjects and languages. The directory has just reached the milestone of 10,000 open access scientific and scholarly journals with the contribution of 124 countries



Open Access publishing, DOAJ, Scholarly Journal

1. Introduction

"Scientific publishing is undergoing significant changes due to the growth of online publications and increases in the number of open access journals". (Voronin, Myrzahmetov & Bernstein, 2011). "open access is the free availability of articles on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself" (Budapest Open Access Initiative, 2002).

The concept of open access (OA) movement has opened new dimensions in the process of information communication. Open access, which provides access to the information content available free of cost, is increasing its domain because of gigantic feedback. Open access has benefited all the sectors of society including researchers and institutions, utmost. It has proved to be more rewarding for the contributors, by providing more visibility and utilization of their contributions. Open access journals are those which are freely available to the public on the internet. These can not only be accessed but can be downloaded, printed, distributed. As open access resources are freely available 24*7 to the user over the internet, these provide requisite appeal to their ideas of contributors.

2. **Scope of the study/ Methodology:** The scope of this study is limited to the Directory of Open access journals (DOAJ). This study is also based on the literature review on the open access movement and DOAJ development & its contribution. The Directory of Open access journals (DOAJ) was accessed to get the data related to this study.

3. **Roads to Open Access Publishing:**

   - **Green Road OA** : authors can provide OA by self-archiving their journal articles in an OA repository or on some other open access website for gratis public use.
   - **Gold Road OA**: Authors publish in Open access journals, which provide immediate open access to all of their articles,

4. **DOAJ: A Brief Profile:** DOAJ is one of the greatest outputs of the open access movement in providing the list of open access journals. The idea of creating a comprehensive Directory of Open Access Journals was discussed for the first time at the First Nordic Conference on Scholarly Communication in Lund/Copenhagen. The Directory is hosted, maintained and partly funded by Lund University Libraries Head Office. It is comprehensive, covering all open access scientific and scholarly journals in all languages, using quality control system to ensure the quality of the contents.. In 2002, DOAJ was

providing access to only 33 periodicals, but now it facilitates access to more than 9800 journals from 124 countries. 5636 journals are searchable at article level. It has more than 1.5 million articles.

- **DOAJ in last 10 Years**

On 12th May 2013, DOAJ has completes its 10 years at the heart of open access movement. The Directory of Open Access Journals continues to add titles at the remarkable rate of 3.5 journals per day. In this period of a decade, DOAJ has been a major reference tool for the scholarly and scientific community, who can find and use these open access journals, now highly visible alongside conventional toll access journals:

- **Milestones in ten years journey of DOAJ are :-**
  - On 14th Feb.2003 Lund University announced the establishment of The Directory of Open Access Journals (DOAJ). The project was created a directory of open access journals and completed in late spring 2003. The DOAJ was implemented in two phases. During the first half, the Directory itself established. The second phase involved developing a comprehensive search system for article-level content. Phase two began in late spring 2003.
  - On 12th May 2003 Lund University Libraries launched the Directory of Open Access Journals (DOAJ, http://www.doaj.org), supported by the Information Program of the Open Society Institute (http://www.osi.hu/infoprogram/), along with SPARC (The Scholarly Publishing and Academic Resources Coalition, (http://www.arl.org/sparc). The directory started with 300 quality controlled scientific and scholarly electronic journals that were freely available on the web.
  - On 8th Feb. 2004 DOAJ added new function-OpenURL compliance. With this function DOAJ's users enabled to more easily find a copy of resource that they were allowed to access.
  - On 3rd June 2004 Lund University Libraries was launched the phase 2 of the Directory of Open Access Journals. The new version of DOAJ included records at article level and a search functionality allowing users to search articles in potentially all Open Access Journals. The directory contained information about more than 1100 open access journals,. As on that day 270 of the 1100 journals were searchable on article level and both numbers are growing. Researchers could now search more than 46.000 articles through the Directory of Open Access Journals and was sure to get access to the articles.
  - In 2005, 565 journals added in DOAJ and total figure reached at 1661.
  - In 2006 on 14th Oct, "For Author Service" was launched. The service was a look up service for authors who wanted to publish their research as open access. At the end of 2006, 2500 open access journals was contained by DOAJ.
  - In 2007 on 7th May, new feature for "Publishers-File upload" was added. By that publisher could upload multiple articles into DOAJ in one go. On 9th May 2007, a new metadata format called "doajArticle" had been added to the OAI-PMH interface. The format was built based on the new DOAJ article XML. At the end of 2007,3000open access journals were contained by DOAJ.
  - In 2008 on 16th April, DOAJ added "New Titles function". By that users were able to retrieve a list of new titles added to DOAJ either by journal title(alphabetically)or by date and time when the journal was added (chronologically). On 23rd April, SPARC Europe and DOAJ announced the launch of the SPARC Europe Seal for open access journals. On 25th July, DOAJ added new Browse by Country function. On 22nd Oct., DOAJ added new RSS function.
  - In 2009, DOAJ received SPARC Europe Award for outstanding Achievements in Scholarly Communications, 2009. From 1st April, Long-term preservation of Open Access Journals was secured. DOAJ crossed the figure of 4000 open access journals also.

- In 2010, DOAJ launched the online guide to open access journals publishing and crossed the figure of 5000 open access journals also.
- In 2011, DOAJ launched a new user interface. The aim had been to keep it simple, without plugins and heavy pictures, and to keep DOAJ usable in areas with low bandwidth. DOAJ site was available in French,Turkish and Greek also. During 24th to 30th Oct. OA week was celebrated.
- In 2012 also during 22nd to 28th Oct. OA week was celebrated.
- In 2013, the new DOAJ team was formed which is mentioned earlier.

In 2013, DOAJ had new web site, with new features. The DOAJ team was completed DOAJ's transition to a new platform.

- DOI is given;
- Advanced search functionality.
- narrow your search results by resource type, language or license type;
- search by author name or keyword from within search results;
- extra browse functionality so you can refine your search, such as words in journal title, country, license type or whether the journal has publication charges or not;

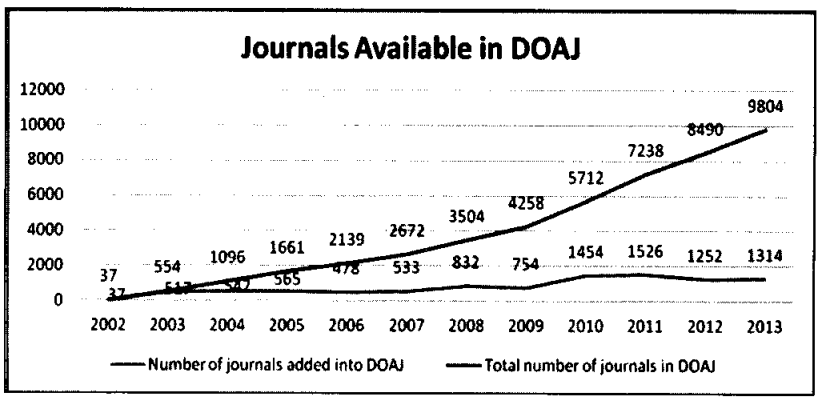
Share/export:

- share with your online communities, such as Facebook, Twitter, LinkedIn and more;
- export references to Reference Manager, EndNote or BibTex;
- updated RSS feed shows articles added per month;

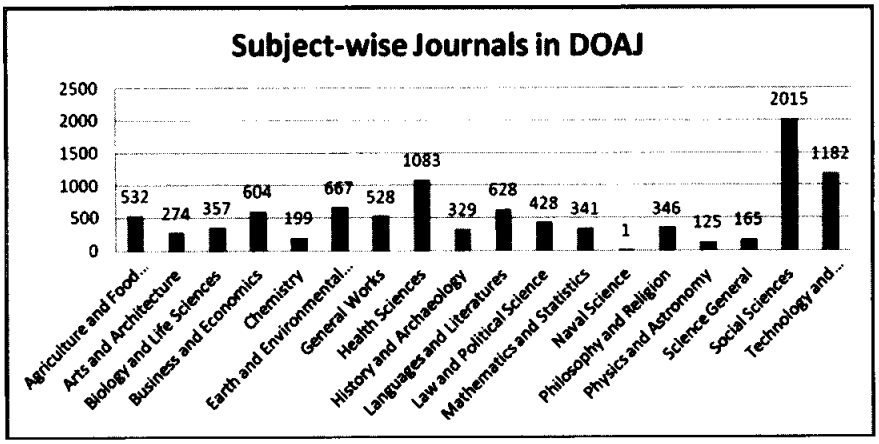
DOAJ hit the 1 Million mark also in 2013. More than 1 million articles were now searchable in DOAJ which meant more than 1 million articles-level metadata entries were available for harvesting. DOAJ started sponsorship of Accelerating Science Award Program. The goal of the ASAP program was to accelerate the open access movement and user awareness towards use of scientific research – published through Open Access. DOAJ celebrated 10 years at the heart of Open Access

Graphical Presentation of DOAJ's Journey
(Data collected on 14th January 2014)

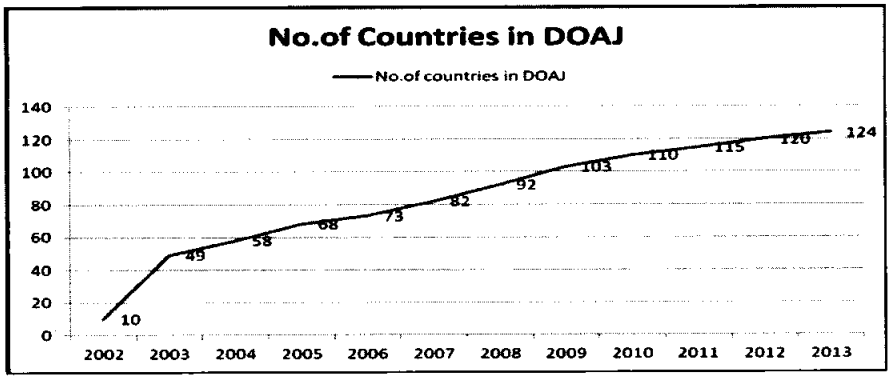
Graph-1



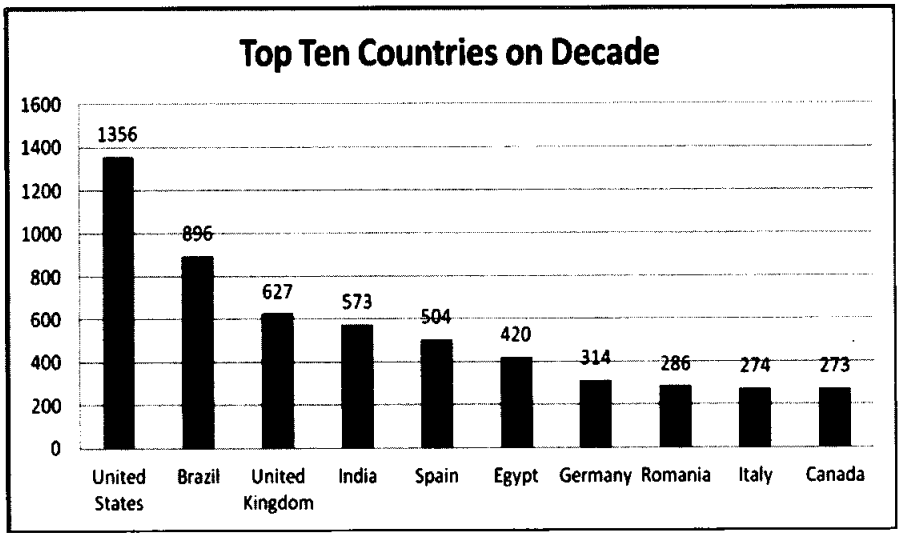
Graph-2



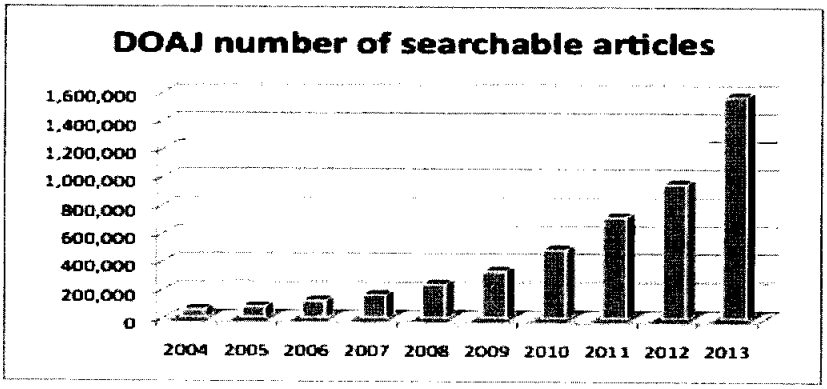
Graph-3



Graph-4



Graph-5



5. Interpretation and analysis

- Graph 1 suggested that more than 400 journals were added every year since its inception. During 2010-2012, more than 1000 journals have been added to the directory which is very encouraging.
- Graph-2 shows that social science & Humanities, Engineering and technology, and health science journals are more in numbers rather than other subjects whereas general science has less than 200 OA journals.
- In Graph -3, it is clear that more than 120 countries were contributing to this directory in last 10 years.
- USA, Brazil, UK and India are at the top of the list of contributing country (see graph-4).
- Most no. of journals (1321) was added from USA followed by Brazil (851).
- India is at the 5th position, well ahead of rest of the countries is quite encouraging.
- 1.6 millions searchable articles have been added to this directory since 2013.

6. Future of DOAJ

DOAJ wants to be "THE one stop shop for users of open access journals" in any language, at journal or article level. As a major reference tool included in library catalogues and other services, it also wants to contribute to the dissemination of open access research, and to make open access the default for academic and scholarly publishing. The next step for 2014 is the implementation of tighter criteria (discussed since March 2013) to ensure that the journals included in DOAJ are quality open access journals. Another step is to ensure a sustainability model for DOAJ itself, for the DOAJ team to be able to work in the best conditions for the years to come, for the benefit of both users and journals. By including journals in 51 languages, with users in 160 countries, DOAJ also leads the way for a truly multilingual open access movement.

7. Conclusion

The importance and usefulness of open access literature and its availability has been realize by the user s all around. Open access to scientific journals requires feasible revenue models and great commitment among its promoters. Open Access journals are one of the potential solutions to the crisis in serial's pricing, particularly for the academic libraries not having adequate funds to subscribe these journals . In short, OA movement made available the research output from academic and research institutions to the public for free. The Directory of Open Access Journals is a significant resource. it is the world's most authoritative list of fully

Open Access, peer-reviewed titles. The service provided by DOAJ is so important that it should be supported by us. Libraries, consortia, universities, and research centres should consider membership; vendors serving the library community are well advised to consider DOAJ membership or sponsorship.

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Emerging Global Networks for Free Access to Law: *Strategies for Thinking Locally and Acting Globally with special Reference to Legal Information Institute of India*

Priya Rai **Akash**

Abstract

The article gives an overview on developmental aspects of legal education and research in globalized digital era. The library science profession is turning towards a new phase of maintenance and dissemination of information resources available out of boundaries of the libraries with no cost to purchase, maintain and store for use. In the era of open access resources, librarians face a number of challenges and have to feel responsibilities to satisfy end users with the help of open access resources. The paper counts the development of Free Access to Law Movement around the World. It further highlights the birth of Legal Information Institutes and the establishment of Legal Information Institute of India covering almost all legal information related to Indian law for fast and easy access to legal researchers and litigators as well.

Open Access; Free Access to Law Movement; Open Access to Law Resources

1. Introduction

Globalization of Information through digital revolution impacts not only the society but also partner to economic and social development of a country, for better education system of the state. Better education and efficient information system plays a vital role in transforming changes among society. Encyclopedia of American Foreign Policy (2002) defined globalization as process of integrating nations and people-politically, economically and culturally into a larger community. The main focus is not on a nation but on the entire globe and open or free access to information is synergic step to look beyond the boundaries of national jurisdictions and process of integration of ICT for common reach. Internet gave birth to free access to law movement during an international conference namely Law Via Internet in 2002 officially. Manifesto of Unesco for free access and dissemination of governmental and public information of all countries supported free access to governmental information. World Legal Information Institute and recently launched Legal Information Institute of India provide free access of legal information generated by public bodies in various countries including India. But in the mean while, librarians have a greater responsibilities and challenges to work smart in the era of free access to law movement. The proactive role of law librarian is to keep watch on new development and provide guidance and outreach methodologies for the awareness and training to audience.

2. Free Access to Law Movement around the World

Poulin (2004) focuses that free dissemination and public access to legal information contributes to democracy and equality before the law and achieves rule of law and further explains four benefits of open access to law as possibility of knowledge of the applicable rule of law; State's compliance to its law; creation of conditions necessary to the equality and fairness of a legal system; and, the improvement of the functioning of democratic institutions.

In late 1960s free access movement was initiated from United States of America. At present almost all countries have uploaded their laws free of cost through official websites. The Free Access to Law Movement adopted it as their joint portal when formed in 2002. It has three main aspects: as a portal making multiple LIIs simultaneously searchable; its own databases; and its catalog and web search. The Declaration on Free Access to Law defines "Public legal information to be legal information produced by public bodies that have a duty to produce law and make it public". It includes primary sources of law, such as legislation, case law and treaties, as well as various secondary (interpretative) public sources, such as reports on preparatory work and law reform, and resulting from boards of inquiry. It also includes legal documents created as a result of

public funding. Free access to law movement at worldwide level was initiated during a conference Law Via Internet. Cornel University of United States took pioneering efforts towards facilitating free access to law.

Legal information institutes of the world, meeting in Montreal, declare that (Palfrey, John):

- Public legal information from all countries and international institutions is part of the common heritage of humanity. Maximizing access to this information promotes justice and the rule of law;
- Public legal information is digital common property and should be accessible to all on a non-profit basis and free of charge;
- Organizations such as legal information institutes have the right to publish public legal information and the government bodies that create or control that information should provide access to it so that it can be published by other parties.

Public legal information means legal information produced by public bodies it has a duty to produce law and make it public. It includes primary sources of law, such as legislation, case law and treaties, as well as various secondary (interpretative) public sources, such as reports on preparatory work and law reforms, and resulting from boards of inquiry. It also includes legal documents created as a result of public funding. Publicly funded secondary (interpretative) legal materials should be accessible for free, but permission to republish is not always appropriate or possible. In particular, free access to legal scholarship may be provided by legal scholarship repositories, legal information institutes or other means. Legal information institutes do the following:

- Publish via the internet public legal information originating from more than one public body;
- Provide free and anonymous public access to that information;
- Do not impede others from obtaining public legal information from its sources and publishing it; and
- Support the objectives set out in this Declaration.

All legal information institutes are encouraged to participate in regional or global free access to law networks. Therefore, the legal information institutes agree to the following

- To promote and support free access to public legal information throughout the world, principally via the Internet
- To recognize the primary role of local initiatives in free access publishing of their own national legal information
- To cooperate to achieve these goals and, in particular, to assist organizations in developing countries to achieve these goals, recognizing the reciprocal advantages that all obtain from access to each other's law
- To help each other and to support, within their means, other organizations that share these goals with respect to the following:
    - Promotion, to governments and other organizations, of public policy conducive to the accessibility of public legal information;
    - Technical assistance, advice and training;
    - Development of open technical standards;
    - Academic exchange of research results.
- To meet at least annually, and to invite other organizations who are legal information institutes to subscribe to this declaration and join those meetings, according to procedures to be established by the parties to this Declaration;
- To provide to the end users of public legal information clear information concerning any conditions of re-use of that information, where this is feasible

3. World Legal Information Institute (WorldLII)

The World Legal Information Institute (WorldLII) was developed by AustLII from 2001 and launched in 2002. Graham (2008) elaborates that the World Legal Information Institute (WorldLII) (2002) was the first multi-LII site, initially incorporating data from AustLII, BAILII, PacLII, HKLII and CanLII, and from South Africa before SAFLII contains (i) the databases provided by any LIIs for that country; (ii) the Catalog entries for that country and web search facility limited to them; and (iii) a 'Law on Google' search which translates the user's LII search into a Google search, limits its scope to that country, and to law-related content.

WorldLII's networking of multiple LIIs makes it the largest free access legal research facility on the Internet because it makes simultaneously searchable the content provided by the other LIIs, comprising nearly 900 databases from 123 countries in all continents. These include some databases from almost all common law and Asian jurisdictions, and (normally) francophone civil law jurisdictions.

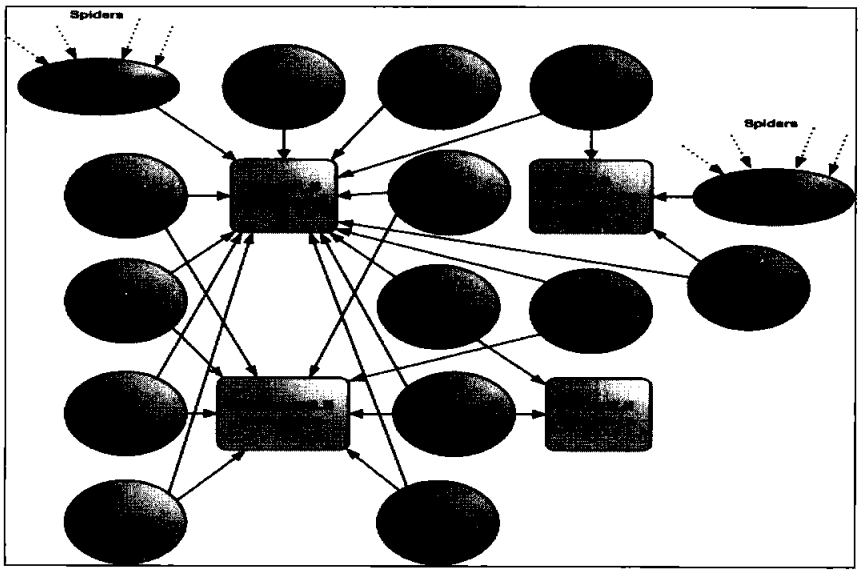


Figure 1: Spider of LIIs

- **WorldLII Databases**

WorldLII provides a single search facility for databases located on the following Legal Information Institutes: Australian Legal Information Institution(AustLII),British and Irish Legal Information Institute (BAILII),Canadian Legal Information Institute (CanLII),Hong Kong Legal Information Institute (HKLII),Legal Information Institute (Cornell) (LII (Cornell)),Pacific Islands Legal Information Institute (PacLII). It also includes searchable collection its own databases not found on other LIIs. These include databases of decisions of international Courts and Tribunals, databases from a number of Asian countries, and databases from South Africa .Over 1246 databases from 123 jurisdictions in 14 Legal Information institutions, nearly 20,000 law journal articles and academic papers available through the Legal Scholarship Network (LSN). It is comprehensive Databases of case-law, legislation, treaties, law reform reports, law journals, and other materials are included.

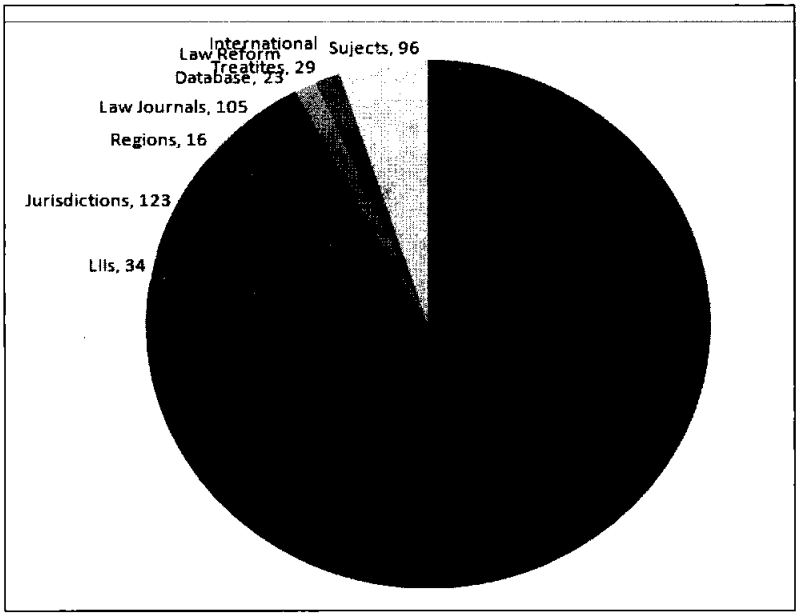


Figure 2: Databases under World Legal Information Institute

The above chart shows that World Legal Information Institute contains 1246 different types of databases. Its coverage includes 96 subject areas. The databases are covered under 123 jurisdictions and 34 LII members around the world. The universe of legal institutes has been divided in 16 regions. WorldLII is enriched with around 105 open access law journals, 23 law reform database and 29 treaty databases.

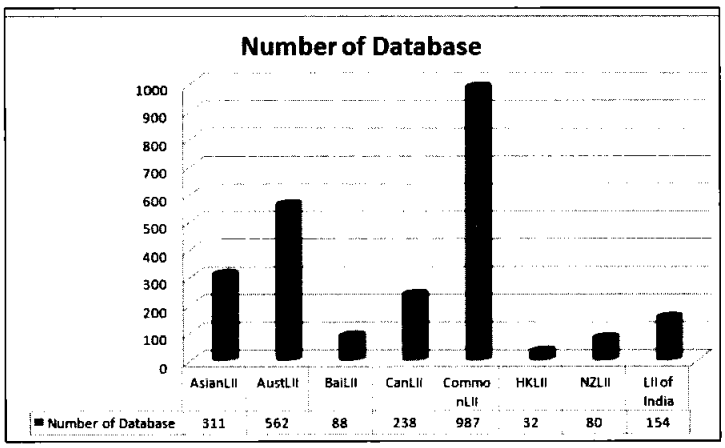


Figure 3: Number of Databases under various Legal Information Institutes

The above chart shows the number of database contained in select eight legal information institutes having different jurisdictions. Asian LII contains 311 databases however LII of India has 154 databases as already included in Asian LII.

- **WorldLII Catalog and Web search**

The WorldLII Catalog provides links to over 15,000 law-related web sites in every country in the world, international institutions and subject based index, developed under Asian Development Bank's 'Project

DIAL'in1997. WorldLII's, Web search makes searchable the full text of as many of these sites as WorldLII's web-spider can reach. It is provides English-language content.

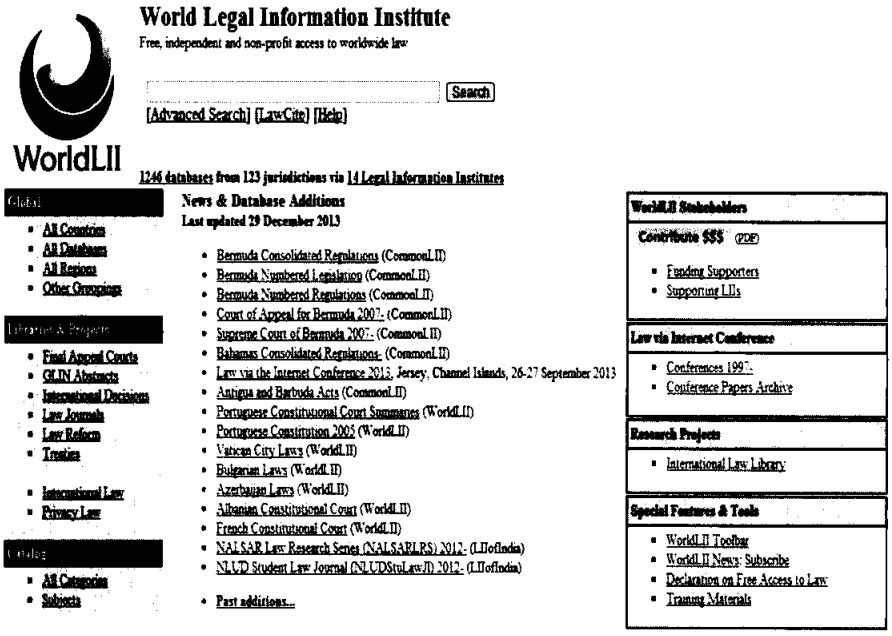


Figure 4: Home page of World Legal Information Institute

4. Legal Information Institute of India

The Legal Information Institute of India (LII of India) <www.liiofindia.org> is an international standard, free-access and non-profit, comprehensive online collection of Indian legal information. The aim is to free access to all types of Indian Legal Information to all types of users who need to know about Indian law particularly valuable to those who are less well off and could not afford to subscribe the access of Commercial data base. It was formally launched in India in February 2011.By Hon'ble Law Minister Dr. Veerapa Moily. Four leading Indian Law Schools are the initial Indian project partners: three National Law Schools (NALSAR University of Law, Hyderabad; National Law School of India University, Bangalore; and National Law University, Delhi), plus Rajiv Gandhi School of Intellectual Property Law, Indian Institute of Technology – Kharagpur. The Australasian Legal Information Institute (AustLII), a joint facility of the Law Faculties of the University of New South Wales and the University of Technology, Sydney, provides the initial technical development, with progressive transfer of operations to the Indian partners. AustLII's involvement is funded primarily by AusAID and the Australian Research Council, with assistance for some databases from the Commonwealth Secretariat in London. Many Indian organizations are also providing content to LII of India.

LII of India is the 34th member of the free access to law movement World LII, Common lii and Asian LII portals with 20 other LIIs across the globe, Indian law on LII of India can be searched from them. It covers over 3lakh post independence cases from 37 courts and Tribunals, The India Code from 1836+60 state & Territory databases, 500+articles form 10 Indian law journals, law commission of India report, 800+ bilateral treaties from foreign ministry and the UNTS. It covers 151 databases searchable simultaneously or separately, cases and legislation together from every state or territory, Powerful search engine results can be ranked by relevance date and citation, Hypertext links from reference to cases or legislation, LawCite Citator tracks all citations of cases and articles.

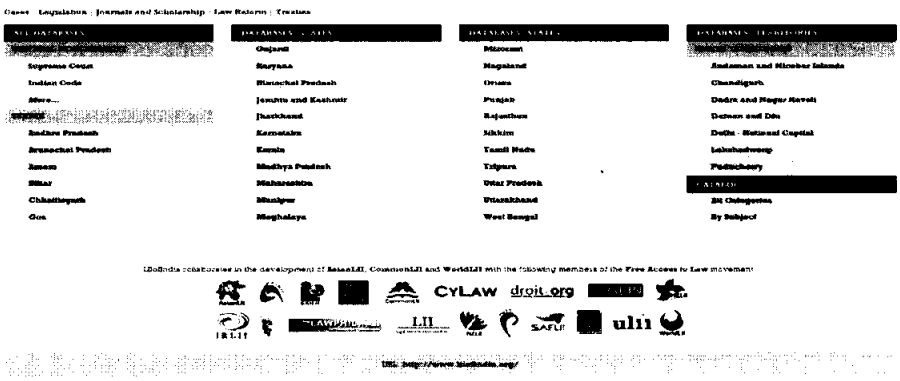


Figure 5: Legal Information under Legal Information Institute of India

The above figure shows the legal information resources containing and disseminated by Legal Information Institute of India. The web portal provides categorized legal information on the basis of central and state government within India. Legal Information like cases, legislations, journals and scholarship, law freeform reports and treaties are accessible through the web-portal. In bottom, logos of other Legal Information Institutes are provided with hyperlinks to direct switch over to them.

5. Responsibilities of Law Librarians towards Free Access to Law Resources

Librarians have a greater challenge to fruitful utilization of IT infrastructure created and provided by universal experts by extending their expertise for the satisfaction of legal information researchers in the era of open access movement. Palfrey (2010) explains six basic cornerstones of law libraries in support of interdisciplinary research and teaching process.

- The role of law libraries in serving communities rather than building collection.
- The libraries must cope with the changing environment like accessing information, performing research, creating new information and remixing old information.
- The collection development policies and public sharing of information
- Technology improvements to meet new challenges and
- The position of libraries as backbone and should support learning and dissemination of digital information.

6. Challenges for New Age Librarians

Apart from above mentioned responsibilities, librarians are also facing a number of new challenges in the information age for better implementation and use of resources in open access.

- Librarians must have basic knowledge of IT and networking and act as knowledge manager to improve knowledge access and transfer and leverage the intellectual assets and facilitate knowledge creation.
- Librarians have to maintain website of the library concern for regular updating focusing general to niche topics on free dissemination.
- Librarians have the greater challenge to provide relevant and reliable information, it need to be filter by setting certain criteria of evaluation.

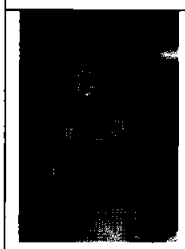
- Some information open access resources disappear or removed by the uploading agencies time to time. Hence it is the primary duty of the librarians to maintain a copy of such resources within the server for further reuse of the clientele.

7. Conclusion

Librarians are crucial players in support of legal scholarship and educations and promoting shared vision of information democracy. It will be inevitable that all professional librarians will require IT background to cope with search strategy to provide information available in public domain and open access. The urgent need is to enlist the senior library professors or librarians responsible for marketing of Open Access resources like World Legal Information Institutes and Legal Information Institute of India designed as legal aid tool.

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Evaluation of Public Domain Resources: *With Special Reference to Law Libraries*

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Public Domain Resources play a vital role in legal education and research. A number of initiatives support open access and free availability of literary information generated by researchers, government organizations, public funded institutions and international organizations. With the spontaneous growth of World Wide Web, it is also a challenge to provide and utilize right information. A set of criteria has been developed and followed as guidelines and principles for effective use of public domain resources. The paper critically examines previous studies evaluating web resources and provides overview of guidelines formulated and followed by a number of libraries. A survey has also been included among law researchers to know their opinion about evaluative criteria they prefer during use of public domain resources.



Open Access; Evaluation of Web Resources; Public Domain Resources

1. Introduction

The World Wide Web can be a great place to accomplish research on many topics. But putting documents or pages on the web is easy, cheap or free, unregulated, and unmonitored. The great wealth that the Internet has brought to so much of society is the ability for people to express themselves, find one another, exchange ideas, discover possible peers worldwide they never would have otherwise met, and, through hypertext links in web pages, suggest so many other people's ideas and personalities to anyone who comes and clicks. Therein lays the rationale for evaluating carefully whatever researchers find on the Web. The burden is on researchers to establish the validity, authorship, timeliness, and integrity of what the find. Documents can easily be copied and falsified or copied with omissions and errors -- intentional or accidental. In the general World Wide Web there are no editors (unlike most print publications) to proofread and "send it back" or "reject it" until it meets the standards of a publishing house's reputation. Most pages found in general search engines for the web are self-published or published by individuals. Even within university and library web sites, there can be many pages that the institution does not try to oversee.

2. Review of Previous Studies: A March Past

Alastair Smith broadly elaborates criteria for evaluation of internet information resources. Smith finds seven broad points to be considered while selecting information for research available on internet. They are scope, content, graphic and multimedia design, purpose, reviews, workability and cost. Smith further extends these seven criteria in inverted terms. Under the **scope** a research has to analyse breadth, depth, time, format of the subject covered. Under the head **content** Smith considers accuracy, authority, currency, uniqueness, links made to other resources, quality of writing. Smith elaborates **workability** with other factors like user friendliness, required computing environment, searching, browsing and organization, interactivity and connectivity. Smith tries to cover almost all factors to evaluate open access information available on internet. **Hope N. Tillman** discusses about evaluating quality on the internet. Tillman critically examines that how users today approaching searching on the net should and critically evaluating the data they find. Initially Tillman discusses the nature of information frequently available and willingness of people to upload information on internet. She emphasizes over number of criteria to evaluate information on internet. They are stated criteria for inclusion of information, **authority** of author or creator, **comparability** with related sources, **stability** of information, appropriateness of **format** and software/hardware/ multimedia requirements. She further explains a number of evaluation tools on the Net viz. popular search engines, general guides and directories, specialized guides and directory partners. She gives her views in key indicators of quality for evaluative internet information covering easy of finding, easy of indentifying, stability of information and ease of use in terms of either convenience or organisation and speed of connection. **Dale Vidmar** critically examines about evaluating web resources. Vidmar initiates his writing with the need of

everyone for quality information. Vidmar says that not every attempt to find good, solid, useful information is successful, especially on the internet and finding reliable information is a process that requires strategy and flexibility. Vidmar outlines six points while considering internet information for research viz. title, author, purpose, currency, accuracy and relevance.

3. Evaluative Principles and Standards adopted by Libraries around the World

Library of University of California Berkeley has formulated evaluation principles of information resources including websites. The website formulates some questions before using websites for research work asking the author or information generation authority, parental institution(s) of the websites, not biased to buy anything, date of frequent updating of websites and hits on the websites by others. The websites give the principles to evaluate web resources namely a) what can the URLs tell? b) Parameter of the page c) indicators of quality information.

Queens' University Library has declared criteria of evaluation of web resources useful for research purposes. The website states that all resources are not equally valuable and reliable and not screened or standardized in any way to determine useful for academic research. The website suggests that while selecting open access resources, the principles like accuracy, authority, currency, purpose and relevance.

University of Mariland University College (UMUC) Libraryprovides criteria to search the web and evaluate web resources. Initially it gives various types of search tools like subject dictionaries, search engines, Meta search engines and other specialized search tools. Further it describes comparative features of search engines. The Library suggests five criteria to evaluate internet based information. They are authority, accuracy, objectivity, currency and coverage. Each criterion has been elaborated in number of questions to find value based internet information.

Jeremy Worsham creates guidelines to evaluate web resources for **Berry College Memorial Library**. The Library has elaborated eleven questions to evaluate web resources under five headings viz. authority, purpose/intended audience, currency, objectivity and accuracy/ support. Before accessing information on internet, a user is advised to evaluate answers of such questions formulated on the page of the Library.

Sheridan Libraries of Johns Hopkins University give detailed document on the website of the University evaluating information found on the internet. The guide discusses the criteria by which scholars in most fields evaluate print information and show how the same criteria can be used to assess information found on the internet. The documents gives six scale points to evaluate information found on the internet viz. authorship, accuracy and verifiability of details, currency, the publishing body, point of view bias and referral to and/or knowledge of the literature. However the document states three criteria which are practically used in evaluating internet sources viz. authorship, publishing body and currency of the document. **Dalhousie University Library** has simply defines sixe steps criteria for evaluation of information over websites. The Library covers authority, purpose, coverage, currency, objectivity and accuracy. **University at Albany, State University of New York Library** has formulated evaluating criteria of web content on the basis of types of internet resources viz. websites, free research sites, document repositories, blogs and wikis, social networking sites, social bookmarks and multimedia. Evaluative criteria of websites include author/producer, type of domain, up-to-date and verification of information through other related linked sources.

Oxford Brookes University Library provides a research guide to support quality research outcomes. Research guide 6 deals with evaluating web sources. The research guide states that whether information available on the web is appropriate to use in academic work and useful for learn and gain from it. The guide enumerates evaluating criteria of web resources in a very simple manner. It includes a number of questions viz. a) who is saying it b) where is they from c) why are they saying it and d) when does this information date from. **Duke University Library** elaborates a set of evaluating principles for web pages might be used for research activities. The Library states five criteria for the procedure viz. authority including

authors/producer, purpose/intended audience, currency and support. The library also gives detailed questions under each head of the criteria.

4. Law Libraries and Evaluative Principles for Public Domain Legal Resources

Law Libraries also require formulating and providing codified rules to utilize web resource information for legal research. A number of scholars and law libraries facilitate their procedural guidelines to research scholars to aware themselves for utilizing authentic information available in public domain.

Robert C. Veerland conducts a research on citation analysis of World Wide Web Sites. He suggests public domain resources has become almost common as a fixture as the reference desk or the study carrel in the libraries. Web continues to grow in importance as a resource for legal researchers. Individual law librarians and professional organizations have made occasional attempts to coordinate Web development efforts. Author conducts a study over usage of websites by gathering the number of hits of visitors to know the importance and usability of information available. He performs evaluative study through various criteria like quantitative analysis, usability, information architecture and other obsolete notions.

Colin Fong and **Terry Hutchinson** formulate criteria to evaluate legal research guides on the internet. They initially suggest to categorizing websites and test a number of parameters to find out reliable legal information sources in support of internet guides. These guidelines are accuracy, currency, updated links, ease of use, original content, equity considerations, inclusion of search engines, access to full text material, formulation of frequently asked questions, information rather than promotional, comments on the site with external rating, The authors conclude that the principles might be helpful to legal researchers for accurate, freely available and fast access of current information.

Marie Stefanini Newman discusses evaluation criteria for law-oriented internet sites and how to use these criteria when launching new sites or improving existing sites. She also discusses the use of quality control procedures to ensure accuracy and reliability in Internet sites, and concludes with a case study of the Pace University School of Law's Website on the United Nations Convention on Contracts for the International Sale of Goods. She gives stress to evaluate the point's viz. Accuracy of the site, authorship of the site, currency of the site, uniqueness of the site, and design of the site and search features of the site. She further formulates a guidelines according to evaluative points viz. a) start with quality content b) make sure the content is accurate, c) make sure authors are known and accountable, d) keep site up-to-date and publicize its currency, e) make your database unique, f) organize material, g) make the database design user-friendly and h) provide powerful search tools.

Kent Milunovich emphasizes over a number of general principles to be pointed while designing and suggesting using websites of law libraries. These principles include consistent layout, homepage as gateway to site, avoid using frames, minimize remote deep linking, use unobtrusive background colour and design, easy to read text, banners, headers, and page title readily visible, accuracy of contents, regular updation, hyperlink, adhere to selected web page URLs, navigation bars, compatible with different web browsers and related legal internet sites.

Diane Murley formulates a number of evaluative principles to rate websites and other information resources for SIU Law Library. Murley states that researcher must evaluate information before its use even published on web in any format. Murley considers several principles like authority, objectivity, accuracy, coverage and timeliness to evaluate web resources. Murley also gives a comprehensive reference list indicating other sources for evaluation of web resources.

Wirtz Labor Law Library enumerates that it is useful to keep in mind basic criteria when evaluating a website for its quality of information. Currently, there are no editors, fact-checkers or standards that exist to ensure accuracy of the vast array of materials published on the World Wide Web. The Library formulates and supports a number of principles. **Accuracy** makes sure the information is reliable, error-free, and can be

verified in another source. **Authority** verifies the author and his/her qualifications to determine if s/he is qualified and/or an expert. Is the source or sponsor **reliable**? Consider the domain (.edu, .com, .gov, .org, .net) as a means of determining further information about the publisher or host. **Objectivity** checks to see if there are biases, including whether the information is free of advertising, and whether the page is designed to influence opinion. **Currency** up-to-dates information is needed, check to see if the page is dated and/or when it was last updated. Coverage -- Check to see if the page is complete or under construction. If the material is based on a print resource, is it the full-text or only part of the text and is it the current version or an outdated version?

The University of Akron, School of Law Library provides guidelines to evaluate websites, blogs, wikis and social networking sites. The websites says that there is no evaluation process for web postings. The web is a self-publishing media. The good, the bad and the ugly all reside on the web and show up in searches. Quality of information, author credibility, and fact checking all vary from high quality down to the lowest extreme. Four broad criteria to use web resources i.e. authority, accuracy, scope and currency have been taken into consideration. **Authority** has been described as creator (s) of the page, credibility of the author, sites link to the page and readability. The library enumerates accuracy as purpose behind the website, lookout for bias/ objectivity and footnoting. Under the heading **scope**, the library covers breadth of coverage of website and depth of coverage of information. Finally the library extends its guidelines for **currency** of the information covering to know date of the website, updation of content and verification of information by other related websites.

Victoria University Law Library states that the uncontrolled nature of the internet makes it is possible for anybody to make any information available. The library further explains that researchers need be equipped with information and skills which enable them to critically evaluate the materials it find. The library classifies the evaluating principles in three headings i.e. Content, Currency and Authority. **Ken State University Law Library** states about encouragement a healthy scepticism when visiting any site and to use criteria to gather evidence on the quality of the information in the websites. The Library suggests evaluating authority, objectivity, accuracy, currency and usability of the information available on the web before consuming for research activities.

5. Research Methodology

Being a part of research, three hundred questionnaires were circulated among the users of the law libraries to find usage and evaluative criteria of information available in public domain through providing nine points i.e. authority, publisher, accuracy, currency, scope, reliability, search tools, arrangement of resources and database design. 150 questionnaires were distributed among law students. 89.33 per cent questionnaires have been received back. It is positive response towards research that 100 per cent responses have been received back from law faculty and research scholars of law universities in Delhi. The least but sufficient to support for research i.e. 74 per cent responses have been received from advocates practicing in National Capital Territory of Delhi. In gross 86.66 per cent questionnaires were received back from users. The data received from all categories are combined for analyzing further research outcomes.

Table 1: Responses received

S.no.	Designation	Questionnaires Distributed	Questionnaires Collected	Percentage
1.	Law Students	150	134	89.33%
2.	Law Faculty	25	25	100%
3.	Research Scholars	25	25	100%
4.	Advocates	100	74	74%
	Total	**300**	**260**	**86.66%**

5. Analysis of Data: User Responses

Users were asked to use evaluative criteria of information available in public domain through providing nine points i.e. authority, publisher, accuracy, currency, scope, reliability, search tools, arrangement of resources and database design.

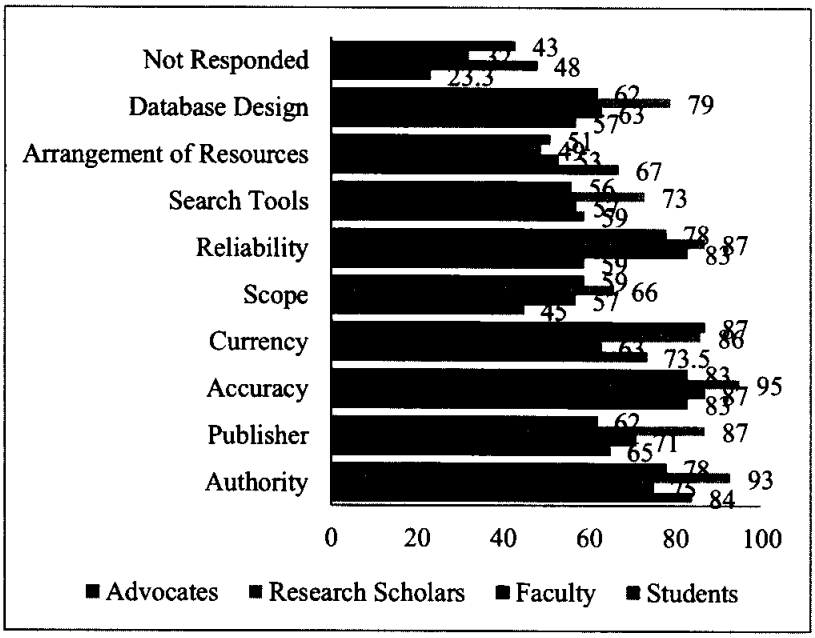


Figure1: Criteria Selected for use of Information available in PDRs

23.3% students, 48 per cent faculty, 32 per cent research scholars and 43 per cent advocates have not responded for the question of evaluative criteria. However out of response received, 93 per cent research scholars, 84 per cent students, 78 per cent advocates and 75 per cent faculty consider authority as essential criteria of evaluation of public domain information. In consideration of publisher of the website, 87 per cent research scholars, 71 per cent faculty, 65 per cent students and 62 per cent advocates feel publishing agency important aspect while using public domain information. 95 per cent research scholars, 87 per cent faculty and 83 per cent students and advocates consider accuracy as important point while accessing open access information. Scope of the information in public domain is considered more by research scholars (66%). Reliability are opted by 87 per cent research scholars. Search Tools of an open access resources are selected by 73 per cent of research scholars. However, arrangement of resources in public domain page is ticked by 67 per cent of students. Database design is again chosen by Research Scholars (79 per cent).

6. Conclusion

The study reveals that researchers are keen to have benefits of open access movement to disseminate and avail benefits of research findings. Studies give footprints of various initiatives like Budapest Open Access Initiative, Bethesda Statement on Open Access Publishing and Berlin Declaration. Free access to law movement started and supported by Montreal Declaration adopted during Law via Internet Conference 2002, have also been discussed in number of research papers. The paper emphasizes over evaluation criteria of web resources followed by various university libraries Viz. University of California Berkeley Library, Queens University Library, University of Mariland University College Library, Dalhousie University Library, State University of New York Library, Oxford Brookes University Library and Duke Law Library. Evaluative criteria adopted by law libraries have also been discussed. The Law Libraries i.e. Victoria University Law Library, Wirtz Labour Law Library and University of Akron, School of Law Library have followed formulated guidelines giving instruction to use web resources to their researchers. The objective of performing the study

is to encourage the law libraries as well as general libraries in India to formulate and guide the ways of using authenticate web resources.

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Impact of Online Journals by Research Scholars: A Survey of Chaudhary Charan Singh University, Meerut (UP) India

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Abstract

Basically online journals are the electronic versions of existing printed journals, e.g. American Chemical Society, all journals in full-text are available through STN international.The main purpose of the study is to find out the impact of online journals by research scholars and library services. The study has explored the strength of e-resources in the library. A questionnaire was designed and distributed to specially research scholars. The study found the interest of online journals, purpose of use online journals, frequency of online journals and comfotability with that.

Online Journals, UGC-Infonet e-journal consortium, Research scholars, Chaudhary Charan Singh University

1. Introduction

With the application of Information and Communication Technology (ICT), particularly the Internet, there has been a shift from traditional print journals to online journals. Print journal refers to conventional print editions published and distributed as paper copies and online journals refer to journal editions available online through computer networks (Internet). The journal editions available online through Internet are also called electronic journals.

Online journals are simply serial publications in which the end products are made available in digital format and whose contents may or may not be peer-reviewed. Basically Internet is used for the dissemination of the online journals. After a print-run of some 340 years, the scholarly journals have now assumed a parallel digital life. With the advent of online access to full-text journals, many academic libraries find themselves in the position of offering both print and electronic access to journals.

2. Objectives of the Study

- To find out the status of online journals;
- To find out the impact of online journals on research scholars;
- To find out the strength of e-resources; and
- To find out the extent of online journals to research scholars in near future.

3. Review of Literature

Amritpal Kaur and Sarita Rani (2012) examined the use of e-journals at Guru Nanak Dev University. The results of the survey provide useful information about the awareness of UGC Infonet Consortium, preferred format for reading articles, purposes of using e-journals, problems faced by the users while accessing e-journals, satisfaction level of researchers with available e-journals in the library. **Mukerjee and Kumar (2010)** conducted a survey of the research scholars of Banaras Hindu University to know the use of online journals available through UGC-Infonet e-journal consortium. The findings of the survey revealed that the channels through which users access e-journals in order of preference were 'search engines' (35.64%) 'Open access scholarly publications' (24.13%) 'Library website' (21.84%) and 'publisher's website' (18.39%). Majority of the respondents (61.90%) were satisfied with the existing model of UGC-Infonet consortium. **Baljinder and Verma (2009)** examined the use of e-resources and services at the central library of IIT Delhi. The study revealed that most of the users (88%) were aware of the e-resources and services. Most of the users (71%) preferred to use both print and electronic formats, 17.45% electronic only and

11.52% print only. **Golwal, Sonwane and Vaishnav (2008)** examined the use of e-journals in Dr. Babasaheb Ambedkar Morathwada University. The results of the survey revealed that a majority of the users (96.03%) used e-journals for 'research' followed by 53.97% for 'preparing notes' or 'getting current information'. The place of accessing e-journals for majority of users was their own department (81.75%). UGC-Infonet centre (71.16%), home (28.4%) and hostel (24.34%). The problems faced by the users included 'lack of training (29.63%)', lack of infrastructure (25.40%), difficult to read on screen (16.14%), not easy to use (12.70%).

4. Methodology

To complete the study a questionnaire was designed based on objectives of the study and distributed among the research scholars. The study was limited to find impact of online journals by research scholars of Chaudhary Charan Singh University Meerut, India. The data analysis and interpretation is based on a sample of 100 research scholars of all departments, Internet lab and Central Library.

Table 1- Status of users

S. No.	Users	No. of Respondent	Percentage
a	M.Phil	70	70%
b	Ph.D	30	30%

Table 1 shows status of users that 100 research scholars are selected as a sample for survey of this study which includes 70 M.Phil research scholars and 30 Ph.D research scholars.

Table 2 - Users from Department

S. No.	Departments	No. of Respondent	Percentage
a	Engineering	03	03%
b	Science	20	20%
c	Social Science	25	25%
d	Any other	52	52%

Table 2 is regarding users from different department. It shows that 20% users are from Science department, 25% users are from Social Science department and 52% users are from other departments such as English, Hindi, Education, Political Science and Psychology.

Table 3 - Awareness of Library's Electronic Resources

S. No.	Awareness of Library's Electronic Resources	No. of Respondent	Percentage
a	YES	89	89%
b	NO	11	11%

Table 3 is regarding user's awareness of Library's Electronic Resources. It shows that 89% respondents are aware about Electronic Resources available in Library whereas 11% respondents are not aware of Library's Electronic Resources.

Table 4 - Adequate training to use Electronic Resources

S. No.	Training to use E- Resources	No. of Respondent	Percentage
a	YES	43	43%
b	NO	57	57%

Table 4 is regarding adequate training to use Electronic Resources to users. It shows that 43% respondents feel the Library provide adequate training to use Electronic Resources but 57% respondents feel that the library does not provide adequate training to use Electronic Resources.

Table 5-Importance of training to use Library E-Resources

S. No.	Importance of training	No. of Respondent	Percentage
a	YES	96	96%
b	NO	04	04%

Table 5 is regarding importance of training. It shows that 96% respondents feel the training is Important to make maximum use of Library Electronic Resources and Services.

Table 6 - Format to use for getting Information

S. No.	Format to use	No. of Respondent	Percentage
a	Print	18	18%
b	Electronic	04	04%
c	Both	78	78%

Table 6 is regarding format used by users. It shows that the majority of respondents 78% use both (Print and Electronic) formats for getting Information whereas 18% respondents use only print format of resources.

Table 7 - Purpose for use of Online Journals

S. No.	Use of Online Journals	No. of Respondent	Percentage
a	Writing papers	25	25%
b	Projects	41	41%
c	Preparing notes	11	11%
d	Seminars	30	30%
e	To support academic work	07	07%
f	Research work	68	68%
g	Other, if any	00	00%

Table 7 is regarding purpose of use of Online Journals. It shows that 68% respondents use Online Journals for research work, 41% respondents use Online Journals for projects, 25% respondents use Online Journals for writing papers, 30% respondents use Online Journals for seminar and 11% respondents use Online Journals for preparing notes and academic works.

Table 8 - Awareness about free Online Journals on the Internet

S. No.	Awareness about free Online Journals	No. of Respondent	Percentage
a	YES	86	86%
b	NO	14	14%

Table 8 shows that 86% respondents are aware about free Online Journals.

Table 9 - Awareness about free Online Journals on the Internet

S. No.	Preference for use of Online Journals/Website	No. of Respondent	Percentage
a	Download the Information and copy to CD/Floppy	57	57%
b	Take printout	43	43%
c	Only reading	25	25%

Table 9 shows that 57% respondents use Online Journals for download the Information and copy to CD/Floppy, 43% respondents use Online Journals for take print out whereas 25% respondents use Online Journals for reading only.

Table 10 - Quality of Information by Internet

S. No.	Quality of Information by Internet	No. of Respondent	Percentage
a	Poor	12	12%
b	Good	68	68%
c	High	20	20%

Table 10 shows that the majority 68% of respondents rates the good quality of Information they acquire from Internet on WWW.

Table 11 - Frequency of using Online Journals

S. No.	Frequency of using Online Journals	Internet	CD ROM Service	Online Journals
A	Daily	48(48%)	04(04%)	22(22%)
B	2-3 times in a week	20(20%)	05(05%)	05(05%)
C	Once a week	09(09%)	07(07%)	04(04%)
C	Occasionally	23(23%)	34(34%)	23(23%)

Table 11 is regarding frequency of using Online Journals. It shows that 48% respondents use Internet daily, 20% respondents use 2-3 times in a week and 23% respondents use Internet occasionally. 34% respondents use CD ROM service occasionally. 22% respondents use Online Journals daily and 23% respondents use Online Journals only occasionally.

Table 12 - Place of access Online Journals

S. No.	Place of access Online Journals	No. of Respondent	Percentage
a	Computer centre	50	50%
b	Library	50	50%
c	Home	07	07%
d	On-campus location	04	04%
e	Off-campus location	07	07%
f	Department	14	14%

Table 12 is regarding place of access Online Journals. It shows that 50% respondents access Online Journals at computer centre, 50% respondents access Online Journals in Library, 14% respondents access Online Journals in Departments and 07% respondents access at home and off-campus location.

Table 13 - Awareness of UGC-INFONET Electronic Journal Consortia subscription

S. No.	Awareness of UGC-INFONET E-Journals	No. of Respondent	Percentage
a	YES	79	79%
b	NO	21	21%

Table 13 shows that 79% respondents are aware about UGC-Infonet Electronic Journals Consortia subscribes to a number of Electronic Journals for Library.

Table 14 - Use of UGC-INFONET E-Journals

S. No.	Use of UGC-INFONET E-Journals	No. of Respondent	Percentage
a	YES	55	55%
b	NO	45	45%

Table 14 shows that 55% respondents use Electronic Journals which subscribed through UGC-Infonet E-Journal Consortia and 45% respondents do not use these Electronic Journals.

Table 15 - Medium of seeking Information

S. No.	Seeking Information from	No. of Respondent	Percentage
a	Current Electronic Journals	09	09%
b	Back Volumes of Electronic Journals	04	04%
c	Online Databases	05	05%
d	Electronic Books	05	05%
e	Online Catalogue (OPAC)	07	07%
f	Internet Website	82	82%
g	CD ROM/DVD	11	11%
h	Electronic Mail	29	29%

Table 15 is regarding seeking Information. It shows that 82% respondents are seeking Information from Internet Websites, 29% respondents are seeking Information from E-mail and 11% respondents are seeking Information from current Electronic Journals, back volumes of Electronic Journals, Online Databases, Electronic Books, Online Catalogue (OPAC), CD ROM/DVD.

Table 16 - Barrier for using online journals

S. No.	Barrier for using Online Journals	No. of Respondent	Percentage
a	Lack of time	61	61%
b	No knowledge of using	16	16%
c	Uncomfortable	11	11%
d	Access time is slow	07	07%
e	Cannot find, what to look for	05	05%
f	Unorganized	07	07%
g	Not easy to use	05	05%
h	Difficult to read from screen	04	04%

Table 16 is regarding barrier for using Online Journals. It shows that 61% respondents feel lack of time is a barrier for using Online Journals and 16% respondents feel other barriers such as no knowledge of using Online Journals, access to Online Journals are uncomfortable, access time is slow, can't find to look for, unorganized, not easy to use and difficult to read from screen.

Table 17 - Comfort ability with Online Journals

S. No.	Comfortable with Online Journals	No. of Respondent	Percentage
a	YES	84	84%
b	NO	16	16%

Table 17 shows that 84% respondents are comfortable with Online Journals.

5. Major Findings of the Study:

- Approximately all research scholars are aware about electronic resources available in library and use also.
- Approximately all research scholars feel that the training should be provide to users to make maximum use of library's electronic resources and services.
- Majority of research scholars use both formats e.g. print and electronic for getting Information.
- Majority of research scholars use online journals for their research work, project and writing papers.
- Approximately all research scholars are aware about free online journal.
- Majority of research scholars use online journals for download the information and copy to CD/Floppy.
- Majority of research scholars use Internet daily for access online journals at computer centre and library.
- Majority of research scholars are aware about UGC-Infonet e- journal consortia and use also.
- Most of research scholars are seeking Information from Internet websites.
- Majority of research scholars feel that the lack of time is a major barrier for using online journals.

6. Recommendations

The present study puts forward the various suggestions to be implemented for the increasing of use of Online Journals in the Central Library of CCS University, Meerut.

- The library should provide adequate training to use Online Journals and other Electronic Resources.
- The Internet speed should be improved to save the time of research scholars.
- The Internet facilities should be made available to all the users for the success of Online Services provided by the Library.
- Personal assistance should be providing to all users for how to use Online Services for different types of requirement.

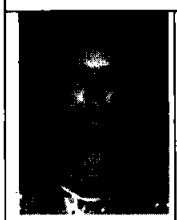
7. Conclusion

The result of the study on impact of Online Journals by research scholars is that the recent development in Information Technology have brought Online Journals as a boon to research community, which are becoming a major source for scholarly communication. An Online Journal is a journal available Online containing research papers, review articles, scholarly communications etc. in the electronic environment teaching, learning and research are being supported by Online Journals which are emerging as new powerful tools. Online Journals have an impact not only on library services but on authors and research programmers too.

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Indian Institutional Digital Repositories on Registry of Open Access Repositories (ROAR): *A Study*

Arvind Kumar **Ramniwas Soni**

Abstract

Due to exponential growth in literature, a big challenge arises before the library and information professionals that how to preserve, organize and access the information from vast collection of the literature. Digital Repositories are proved to be a great boon to meet the requirement to the library and information professional to overcome these challenges. Universities, colleges and other research institutions across the world are providing the open cloud to their research outputs, achieve collections (Public domain literature), rare collections through Institutional Digital Repositories. According to ROAR there are more than 3500 institutional repositories registered from different countries in different languages on various subject. Out of 3585, 99 IRs are listed from India.

Institutional Digital Repositories, ROAR, Open Access, ROARMAP.

1. Introduction

In this modern digital era, the principal objective of the library and information centers is to keep their clientele up-to-date by providing access to the information in their areas of interest. Digital Repositories are becoming an important tool for digital preservation open archiving and open access. Open access is getting momentum in all over the world. By setting up Institutional Digital Repositories, Institutions have overcome the access barrier of scholarly publication. In India many of the Govt. as well as Private institutions have set up their Digital Repositories and moved forward towards the open access movement. IITs, IIMs, NITs, Govt. Universities and some other reputed institutions in India have already set their repositories up that archive and disseminate their research outputs of their respective users.

Some of the IRs is in open access and some are restricted to the local level access only. Some IRs in India provide access to metadata to the external user on the web, however they provide full text data to their own patrons on the intranet, it is because of copy right issue, band width issues, & local institutional policies. In India IR movement has started in 2004 and in last 10 years it got a terrific response.

2. Registry of Open Access Repositories-(ROAR)

ROAR was evolved from University of Southampton in 2003 created by and part of Eprints. It is indexing of the location, growth of open access institutional repositories, creation, and their contents, and it is searchable internationally. Now this time In ROAR 2500 Institutional Repositories have been registered in ROAR. ROAR associate database, the (ROARMAP) Registry of Open Access Repositories Mandatory Archiving Policies , The growth of open access mandates can be searchable international registry charting by the ROARMAP. It is opted by research funders, universities and research institute that desire researchers to provide open access to their peer reviewed research article output.

3. Objective of the Study

This Study aims to analyze the Indian Institutional Digital repositories listed and registered on ROAR on the basis of some criteria. This study also highlights the growth and development of IRs during past decade.

4. Scope of the study

The scope of this study is limited to the ROAR; The Repositories on Registry of Open Access Repositories is an online directory of IRs available on the globe. The present analysis is based the data available on ROAR, accessed on Jan 14, 2014.

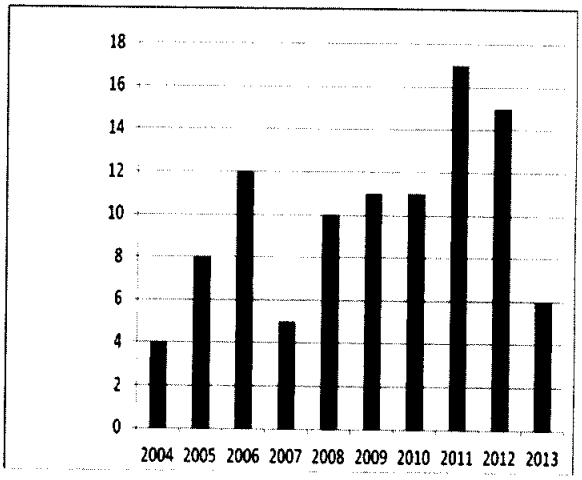
5. Growth of IRs in India

IR movement was started in India in 2004, and it getting speed year after year. There are 97 IRs listed in ROAR developed and maintain by various institutions. UGC and other academic agencies are also emphasizing on IRs development in India. **Sodhganga** of UGC and **Vidyanidhi** of University of maysore, **e gyankosh** of IGNOU, and **NPTEL** of IITs are the great example of efforts made by the govt. in this respect.

Table-1

Year	No. of IRs
2004	4
2005	8
2006	12
2007	5
2008	10
2009	11
2010	11
2011	17
2012	15
2013	6
Total	**99**

Graph-1



Graph-1 shows that development in IRs in India has not been consistent in last 10 years ,also it shows that IRs development graph never touched the no. more than 17 .In 2011 and 2012 ,its registered max. no of Indian Repositories i.e. 17 and 15 respectively.

Table 2: Some Major repositories in India on ROAR

Name of IR /Institutions	Establish mentDate	Software Used	Available at	Record	Type of IR
Dspace-IIT Bombay	15 Dece.2011	Dspace	http://dspace.library.iitb.ac.in/jspui/	14099	Res. Instit. or Departmental
ShodhaGanga-Inflibnet.A resevior of Indian Theses	23 October 2011	Dspace	http://shodhganga.inflibnet.ac.in/	12809	other
Dspace-Indian Institute of Astrophysics	11 November 2004	Dspace	http://prints.iiap.res.in/	6287	Res.Instit. or Departmental
Vidyanidhi-University of Mysore	Unknown	Dspace	http://dspace.vidyanidhi.org.in:8080/dspace/	5482	Res.Instit. or Departmental
Openmid-National Informatics Centre	22 March 2005	Eprints	http://openmed.nic.in/	2904	Res. Cross-Institutional
Eprints-IIT Delhi	28 May 2005	Dspace	http://eprint.iitd.ac.in/dspace	2143	e-thesis
Dspace-nitr-NIT Rourkela	18 May 2005	Dspace	http://dspace.nitrkl.ac.in/dspace/	1883	Res.Instit. or Departmental
Bhagirathi-IIT Roorkee	1 July 2012	Dspace	http://bhagirathi.iitr.ac.in/dspace/	1100	Res. Instit. or Departmental
Dspace-Inflibnet	15 June 2006	Dspace	http://ir.inflibnet.ac.in/	505	Res.Instit. or Departmental

Eprints-IIM Kozhikode	29 December 2005	Dspace	http://dspace.iimk.ac.in/	503	Res.Instit. or Departmental
Eprints-Indian Institute of Science, Bangalore	5 April 2004	Eprints	http://eprints.iisc.ernet.in/	186	Res.Instit. or Departmental
Eprints-Dr. Mohan's Diabetes Specialities Centre,Diabetes	24 September 2009	Eprints	http://mdrf-eprints.in/	100	Res.Instit. or Departmental
Eprints-NML, Jamshedpur	19 September 2009	Eprints	http://eprints.nmlindia.org/	100	Res.Instit. or Departmental
Eprints-CSIR,URDIP, Pune	2 July 2009	Eprints	http://eprints.csirexplorations.com/	100	E-thesis
Ethesis-nitr - ethesis Rourkela	17 April 2009	Eprints	http://ethesis.nitrkl.ac.in/	100	e-thesis
Dyuthi-Cochin university of S&T	8 July 2008	Dspace	http://dyuthi.cusat.ac.in/dspace/	100	Res.Instit. or Departmental
Dspace-NISCAIR (NOPR)	18 February 2008	Dspace	http://nopr.niscair.res.in/	100	Res.Instit. or Departmental
EPrints-CFTRI	4 July 2007	Eprints	http://ir.cftri.com	100	Res.Instit. or Departmental
Dspace-NIO,Goa	6 April 2006	Dspace	http://drs.nio.org/	100	Res.Instit. or Departmental
Dspace-RRIDR,Bangalore	19 April 2005	Dspace	http://dspace.rri.res.in/	100	Res.Instit. or Departmental
Eprints - International Crops Research Institute for the Semi-Arid Tropics	2 April 2012	Eprints	http://oar.icrisat.org	99	Res.Instit. or Departmental
Eprints-Interna. Crops Res. Insti. for the Semi-Arid Tropics	7 February 2012	Eprints	http://oar.icrisat.org	99	Res.Instit. or Departmental
Eprints-IICB,Kolkata	23 September 2011	Eprints	http://www.eprints.iicb.res.in	NA	Res.Instit. or Departmental
Eprints-IIM Kozhikode	25 March 2012	Dspace	http://www.iimk.ac.in/gsdl/cgi-bin/library	NA	Res.Instit. or Departmental
DSpace-Institute of Mathematical Science	15 January 2012	Dspace	http://www.imsc.res.in/xmlui	NA	Res.Instit. or Departmental
Dspace-University of Hyderabad	30 October 2008	Dspace	http://digilib.uohyd.ernet.in/dspace	NA	Res.Instit. or Departmental
Eprints-IIM Kozhikode	4 May 2006	Eprint	http://eprints.iimk.ac.in/	NA	Res.Instit. or Departmental
Dspace-ISI Library, Bangalore	4 May 2006	Dspace	http://library.isibang.ac.in:8080/dspace/	NA	Res.Instit. or Departmental

6. Type of Repositories in India

According to data available there are eight types of Digital repositories running in India. They are as listed in table -2.

Table 3

S.N.	Types of Repositories	No. of Repositories	%
1	Research Institutional and Departmental	65	66
2	Research Multi-Institutional Repositories	2	2
3	Research Cross Institutional Repositories	8	8
4	e-Journal/Publication Repositories	3	3
5	e-Thesis Repositories	8	8
6	Research Data Repositories	1	1
7	Learning and Teaching Object Repositories	3	3
8	Other repositories	9	9
	Total :	99	100

Here gives the repositories in the reference of type of research institutional repositories with software used.

Table 4: Research Institutional or Departmental

Name of Repositories	Software
Dspace-Indian Institute of Astrophysics	Dspace
National Institute of Technology, Rourkela	Dspace
National Centre for Catalysis Research (IIT): Catalysis Database	Eprints
National Center for Antarctic Research , Goa	Dspace
Digital Knowledge Repository of CDRI	Dspace
DKR-CDRI	Eprints
Eprints-IARI	Dspace
Kautilya Digital Repository	Dspace
Indian Institute of Science, Bangalore, India	Eprints
DU Eprint Archive	Eprints
DSpace - GGSIPU	Dspace
Eprints-CMFRI	Eprints
Eprints-MDRF	Eprints
Eprints-NML	Eprints
Dyuthi at CUSAT	Dspace
Niscar online periodicals repositories (NOPR)	Dspace
ePrints-CFTRI	Eprints
National Institute Of Oceanography, India	Dspace
Raman Research Institute Digital Repository	Dspace
OAR-ICRISAT	Eprints
IIT Bombay Institutional Repository	Dspace
EPrints-IICB	Eprints
Eprints-SBT MKU	Eprints
NAL-IR	Eprints
CSIR-AMPRI DRS - CSIR-AMPRI DRS	Eprints
EPrints-ATREE	Eprints
IR-NPL	Eprints
IR-NPL	Eprints
DSpace at M S University	Dspace
Bhagirathi -IIT Roorkee	Dspace
DSpace at IUCAA	Dspace
IIM Kozhikode Digital Library	
DSpace-IMSC	Dspace
IIT Bombay Institutional Repository	Dspace
Dhananjayarao Gadigil Library	Dspace

Open Access E-Repository - IIHR	Dspace
IIPI-Repository	Dspace
DSpace at CUSAT	Dspace
Cusat Digital Library	Dspace
Indian Academy of Sciences: Publications of Fellows	Eprints
Dspace - sdmcet	Dspace
Vidya Prasarak Mandal - Thane	Dspace
Knowledge Repository of Indian Institute of Horticultural Research	Dspace
DSpace-PDPU	Dspace
Indian Institute of Spices Research, Kozhikode	Dspace
DSpace-IITB	Dspace
Madurai Kamaraj University Repository	Eprints
Eprints-mku	Eprints
Delhi College of Engineering Repository	Various
DSpace at NCRA	Dspace
Allama Iqbal Library Digital Collection	Greenstone
National Institute of Immunology (NII),	Eprints
DSpace at University of Hyderabad	Dspace
KR-CIMAP	Dspace
DSpace at Guru Gobind Singh Indraprastha University, Delhi	Dspace
EPrints-IIMK: Indian Institute of Management Kozhikode Scholarship Repository	Eprints
ISI Library, Bangalore	Dspace
Indian Institute of Information Technology	Eprints

Table 5: Research Cross-Institutional

Name of Repositories	Software
DSpace - INFLIBNET: Home	Dspace
Institutional repository of Intellectual Contributions of DTU	Dspace
Librarians' Digital Library	Dspace
Open Access Digital Repository of Ministry of Earth Sciences, Government of India	Eprints
Open Access: Agriculture Research Repository	unknown
OpenMED-NIC	Eprints
Rice Knowledge Management Portal	unknown
Welcome to Entrepo - Entrepo	

Table 6: e-journal/ publications

Name of Repositories	Software
Bioinformation	Various
Rajiv Ghandi Center For Biotechnology	Various
Siddha Articles- Bethesda CAM Research Center	Various

Table 7: e-thesis

Name of Repositories	Software
E-theses A Saurashtra University Library Service	Eprints
EPrints-IIT Delhi	Dspace
ETD-Dharwad	unknown
ETD-IISc	Dspace
Mahatma Gandhi University OnlineTHESIS Searc	various
National chemical Laboratory - Pune	Dspace
Open Access Repository of Indian Theses	Eprints
Welcome to ethesis-nitr - ethesis	Eprints

Table 8: Research Data

Name of Repositories	Software
OpenDOAR (Directory of Open Access Repositories)	Unspecified

Table 9: Learning and Teaching Object

Name of Repositories	Software
DSpace - Bangalore Management Academy	Dspace
DSpace - Vidya Prasarak Mandal (Thane)	Dspace
National Science Digital Library at NISCAIR	Dspace

Table 10: Others

Name of Repositories	Software
Delhi College of Engineering	Dspace
DSpace at ICFAI (IBS), Ahmedabad	Dspace
Institutional repository at MDI	Dspace
Knowledge Repository Open Network, Kashmir	Dspace
Osmania University Digital Library [OUDL]	Dspace
Physical Research Laboratory Library	Greenstone
ShodhaGanga: A resevior of Indian Theses	Dspace

7. Major Findings of the Study

From the above study of 99 Indian repositories, it is found that

- Growth rate of IRs per year is quite low in compare to other developed countries.
- In Indian IRs, D-space and EPrints open source software are used rather than others.
- More than half of the repositories are on Dspace open source software in India.
- Only a few IR contains special items.
- Research Institutional and Departmental Digital Repositories are more in numbers in India,
- There are some discrepancies in data on ROAR, like in the list of countries the given no. of IRs are 97 while it shows 99 if we browse county wise data.
- There is no option to browse language wise Repositories while we can search the same on DOAR.
- India has maximum no of repositories among Asian countries.
- IIT Bombay has maximum no. of records (14099).

8. Conclusion

The main purpose of Institutional Repository is to showcase intellectual capital of the institution that can be helpful to the researchers. Digital repositories growth rate in India is quite low in comparison with other countries but it is encouraging as it is on top among Asian countries. As the present study shows that only 99 IRS are listed in ROAR, while the actual figure is rather than more than that, it is because of not maintaining and registering the repository having Indian institutions or other agencies. Some other studies on the IRs disclose that many of the repositories were set up in India just at initiate level but they could not be continued because of some barrier or challenges , like Institutional policies, unskilled professionals, lack of proper guidance, lack of interest, insufficient funds and lack of support . In India, Libraries and Information Professionals needs to take positive initiation to develop the Institutional Repository and need to add more materials in it and made it accessible all over the world so that the users will get benefitted by the research outputs.

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Institutional Repository- *A Key to Modern Preservation*

Anindya Bhattacharya



The growing demand for easy accessibility, timely and faster delivery of results and wider gamut of international coverage of business, technology and law have made modern librarians look for effective ways to meet the information demands of their customers. Institutional Repositories (IRs) are, per se, digital collections that capture and preserve the intellectual output of a single or multi university community. These repositories are meant to be sustainable over time and support preservation strategies. The open source movement triggers this modern genre replete with salutary benefits. This paper highlights the meaning of IR, its architecture, various open source software required to build it, librarian's role to handle it and also some effective IRs currently working in India.



IR, System Requirements, Open Source Software, OAI-PMH Framework

1. Introduction

Information and Communication Technology (ICT) has defined this age which is characterized by new ways of information generation, managing and dissemination. Institutional Repositories (IRs) play a fundamental role in centralizing, preserving and making accessible institution's intellectual output. At the same time, they form part of a global system of distributed and interoperable repositories that provide the foundation for a new disaggregated model of scholarly publishing. Each institutional repository generally serves a particular community. Usually, the community is a college or university or a specialized research institution.

2. What is an IRs?

A repository is a central place where data are stored. In a repository multiple databases and files are located for being distributed over a network. An Institutional Repository is a digital archive of the research output created by the faculty, research staff and students of an institution and accessible over the internet to end users both within and outside the institution. The four main objectives for having an institutional repository are:

- To provide open access to institutional research output by self-archiving it.
- To create global visibility for an institution's scholarly research.
- To collect content in a single location
- To store and preserve other institutional digital assets, including unpublished or otherwise easily lost ('grey') literature such as theses or technical reports.

3. Importance

IRs are relevant to modern age for following reasons:

- Digital archive of research publications that will be accessible anywhere through the internet.
- It increases the accessibility and impact of research among students in the colleges.
- Improve research and knowledge management.
- Long term preservation of scholarly papers.
- Rapid communication.
- Establish priority for research findings.
- To support open access movement.

4. Establishing IR

For developing an IR takes major investment of time and energy. Besides selecting software and implementing it, it is necessary to have the support of the institution as a whole for the project to be a success. An effective IR represents collaboration among librarians, information technologists, archives and records managers, faculty and university administrators and policy makers. Thus collaboration among institutional departments is sine qua non and the repository will need to be effectively marketed to members of the university community with a view to acquiring content.

5. System Requirements:

Hardware:

- High speed face up book scanner with OCR software for digitization
- MPEG card (convert video record into digital form)
- For local access (LAN): PCs interconnected via LAN which support TCP/IP, HTTP etc.
- For Global Access (WAN): Web Server domain name, IP address etc.

Software:

Client Side:

- Internet Explorer (4.0 onwards)
- Network Navigator
- Mozila firefox

Server Side:

- Apache web server (ver 1.x or 2.x)
- IIS 4.0 onwards
- Personal Web Server(PWS)

6. Software Requirements

The rise of IR is significantly increasing in large part due to the fact that several digital repository software products are available especially open source software (OSS). The directory of open access digital repositories (Open DOAR) illustrates that the most widely used open source products are DSpace and EPrints (Open DOAR, 2008).

Name	Sponsors	Features
DSpace	MIT & Hewlett Packard	Dublin Core OAI Compliant Import/ Export Full text search
EPrints	University of Southampton	Web based interface Archive can use any metadata scheme
Fedora	Red Hat	OAI compliant Dublin core metadata Content versioning XML submission
Greenstone	University of Waikato	Export to CD ROM feature Multilingual
Invenio	CERN Document Sever Software Consortium	Great flexibility Publish digital content with ease.

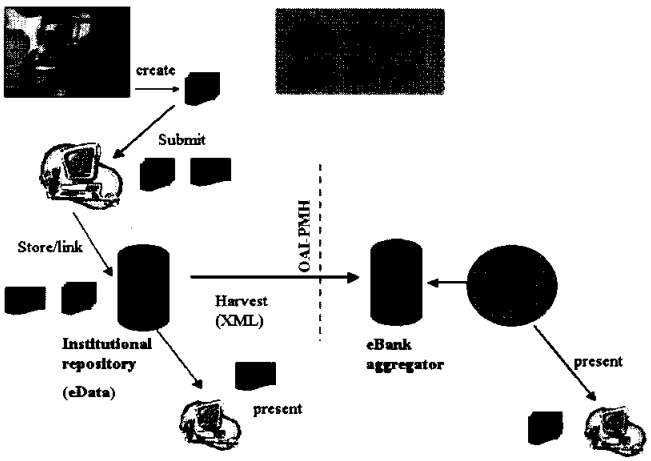
There is some propriety software also:

Name	Sponsors	Features
Digital Commons	Berkley Electronic Press	Supports OAI-PMH version 2.0 Can collect, preserve and make visible pre-prints, working papers, journal articles, dissertations, database images
Simple DL	Amazon EC2	UTF-8 compatible Not limited by format Capable of handling documents, PDFs, images, videos, audio files etc.

7. The OAI-PMH Framework

Institutional Repository is often seen as tools for preservation. No software can do the entire job of preservation. The existence of IRs has been made possible by the development of standards and tools that facilitate interoperability between multiple repositories. The most important of these is the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH). The protocol provides an interoperability framework based on the harvesting of metadata. To that end, it defines a simple set of metadata that can facilitate federated resource discovery. The protocol divides users of the OAI-PMH into two main categories:

Data Providers- those who provide repository services and populate them with metadata. Service Providers- those that harvest this metadata to create services, chiefly to aid the discovery of the resources described by data providers but also as a basis for building value-added services. The OAI-PMH uses metadata harvesting to allow data providers to share metadata with service providers.



8. Digital Preservation:

Simultaneously with open access to research materials, digital preservation is an important motivation for building institutional repositories- to ensure digital research materials are available and accessible in the long term.

There are slew of preservation strategies employed to offer short or long term preservation:

Strategies	Functions
Bitstream Copying	Where one makes a duplicate of the digital object
Durable, persistent metadata	Where one preserves the physical media or CD on which the object is stored
Migration	Where one copies data from one technology to another to avoid obsolescence of both the physical media and data format
Standards	Relies on recognized, long-term standards over proprietary formats
Emulation	Process of reproducing software and hardware environments to translate code from one computing environment to run on another
Encapsulation	As part of an emulation strategy where objects and metadata are grouped together to help to decode and render object later

9. Librarians and Institutional Repositories

Reference Librarians can play a significant role in planning, establishing and supporting IRs. They can:

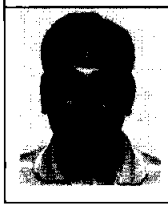
- Help to create sensible IR policies and procedures
- Assist in designing the IR user interface
- Help to identify current self-archiving activity
- Inform faculty and graduate students about Creative Commons licensing options and publisher e-print policies.
- Participate in the creation of IR metadata such as local controlled vocabularies.

10. Conclusion

The present age stays wedded to the unprecedented growth of information and knowledge and its cascading effect on the users. IR is a visible manifestation of the emerging importance of knowledge management within research institution. The collection development policy of institutional repositories needs to be reviewed regularly and users' feedback obtained from the user communities. Some IRs in India have just kick- started their operations. Their presence and popularity may increasingly be known through postings in list servers, web search engines, metadata harvesting services and publicity campaigns. The library of the future will be of immense help to the users to access vast information resources of the world and IR will guide them to the right destination.

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Open Access Repositories in Library and Information Science: *A Study of Open DOAR*

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Advancement in ICT, changing publishing trends, massive growth of e-journals and restricted access to scholarly literature has resulted in emergence of open access repositories (OARs) to disseminate scholarly material for global visibility of research output in different forms. Open access initiatives (OAI) worldwide are considered as a boon for digital preservation and provide a platform to Institutions to organize their research outcome. The present study examines the current status of Open Access Repositories (OARs) in Library & Information Science (LIS) field under open DOAR. The study also explores growth and development of these OARs in terms Contents, Operation and management Policies, software used languages etc. The analysis reveals that out of 2562 OARs in open DOAR, 120 related to Library & Information Science. D Space and e prints are the most popular OSS adopted for digital preservation of contents.



Open access (OA), OARs, Institutional Repositories (IRs), DOAR, Library & Information Science (LIS)

1. Introduction

The development of information communication & technology (ICT), emergence of digital technology & preservation platforms, rapid increase in scholarly research output, inflated prices of journals, restricted access to research literature resulted in the emergence and growth of OARs. Open access initiatives facilitates the availability, organization and distribution of knowledge worldwide free of charge. OARs help academic and research institutions in maximizing the global accessibility and visibility of their scholarly literature. Open Access movement appear as a boon for digital preservation and strengthened the free access to scholarly communication. "Open access, which evolved out of the necessity of wider access to scholarly publication, relies on the initiatives of individuals (through self-archiving) and institutions. It is a philosophy of facilitating wider communication, feedback and use of scholarly material." IFLA

The open access was emphasized in the Budapest Open Access Initiative (BOAI) convened by Open Society Institute (OSI) in the year 2002. BOAI was the first initiative to use the term "open access". The primary purpose of BOAI is to enhance and accelerate research. Open access is barrier free access. OARs are being established to provide open access to the institution's output and to support preservation.

2. Open-DOAR

The Open-DOAR is a quality-assured listing of open access repositories around the world, which is maintained by SHERPA Services, based at the Centre for Research Communications at the University of Nottingham in the United Kingdom. Open-DOAR is primarily a service to enhance and support the academic and research activities of the global community.Open-DOAR harvest and assign metadata to allow categorization and analysis to assist the wider use and exploitation of repositories. Repositories are monitored by Open-DOAR to ensure a high degree of quality and consistency in the information provided.

3. Literature Review

It gives a theoretical basis for the research and help investigators to determine the nature of their own research. We consulted articles dealing exclusively with OARs including specific disciplines OARs, their status rather than trying to collect a large number of works that are not as closely to our present study.

Ghosh & Das (2007) provides an overview about the present state of open access initiatives by various institutions of the country. The study also reveals that some initiatives have also been taken in the area of metadata harvesting services particularly public funded ones. The future of open access in India is dependent upon a proper policy and developing a proper framework. Bhat (2009) reports evaluation of nine Open Access Repositories from Open-DOAR in the field of Computer Science and IT in terms of the background, resources, content management policies, preservation policies, rights management, promotion, advertisement, services, feedback and access statistics of the repositories. Roy, Jan & Khan (2010) highlights the present scenario of disciplinary repositories and their analysis by choosing parameters like country, organization, most frequent content type and subjects contained. Bhat (2010) reviewed the literature related to the varied aspects including OA advocacy, apprehensions, author attitudes, operations, deployment, and copyright and preservation issues related to OARs. Abrizah, Noorhidawati &Kiran (2010) describes the current status and characteristics of OARs in Asian universities in terms of of types, contents, disciplines, language, technical and operational issues, and policy. The study revealed that out of the 191 Asian organizational institutional repositories identified in this study, only 48 are listed in the Top 400 Ranking Web of World Repositories (RWWR).Findings denote Japan as the biggest contributor of Asian repositories, followed by India and Taiwan. Mukherjee & Nazim (2011) attempt to analyse the present trend of institutional archives worldwide from various Directories of Institutional Repositories. Data was analysed in terms of quantity of institutional archives increased during last six years, country wise contents of institutional archives, types of materials archived, subject coverage, software used, language of interface of institutional archives, host domains, and policy of institutional archives. The results of the study suggest healthy growth in terms of quantity of institutional archives' increase worldwide, however, the development is more prevalent in developed countries than developing countries. The subject analysis of the institutional archives indicates that the contributors in the field of health and medicine are more interested to submit their materials in repositories. Mukhopadhyay&Biswas (2012) found that there is scope for developing a 'Best Practice Guidelines' for designing Institutional Digital Repositories. Manpower requirements, quality and quantity of contents, metadata standards, technical specifications, copyrights barrier, and policy issues are major concerns that need to be addressed for developing IDRs as component of open access knowledge movement. However, the findings of study suggest that IDRs could become a compelling and useful tool for collecting, organizing and disseminating intellectual output of an institute.

4. Objectives

- To identify the presence of Library & Information Science (LIS) OARs under open-DOAR;
- To compare the OARs worldwide with LIS OARs;
- To identify most frequent languages used in OARs;
- To identify the core content types;
- To determine various software used for creation of LIS OARs and
- To identify the various types of OARs and their operational status and policies

5. Methodology

The data for the present study was collected from the "Directory of Open Access Repositories", popularly known as Open-DOAR (www.opendoar.org).The search was limited to OARs in "Library and Information Science" by choosing various parameters like country wise distribution, content types, OAR software used, OARs types, operational status, languages etc. Total 2562 Open Access Repositories worldwide were identified under open-DOAR (as on January, 20 2014) and 120 OARs were found related to "LIS" .These were analyzed with the help of SPSS package in the form of tables and charts.

6. Findings

Table 1. Subject wise OARs in Open DOAR		
Subjects	Worldwide Repositories	LIS Repositories
Multidisciplinary	1527	59.6
Health and Medicine	251	9.8
Arts, Performing Arts & Humanities	226	8.8
Education & Psychology	225	8.8
History and Archaeology	210	8.2
Earth, Planetary Sciences, Ecology & Envt.	203	7.9
Business and Economics	197	7.7
Law and Politics	187	7.3
Technology General	183	7.1
Science General	179	7
Computers and IT	162	6.3
Social Sciences General	155	6
Geography	151	5.9
Biology and Biochemistry	132	5.2
Library and Information Science	120	4.6
Language and Literature	117	4.6
Agriculture, Food and Veterinary	112	4.4
Mechanical and Electronic Engineering	111	4.3
Mathematics and Statistics	104	4.1
Philosophy and Religion	102	4
Physics and Astronomy	92	3.6
Chemistry and Chemical Technology	92	3.6
Management & Planning	87	3.4
Architecture	53	2.1
Civil Engineering	40	1.6

Table 1 shows that majority of repositories 1527 (57.8%) have multidisciplinary contents. Health and Medical science consists of largest number of repositories with 251 (9.8%). There are 120 (4.6%) repositories exists in the field of Library and Information Science.

Table 2. Country wise Distribution of OARs		
Country	Worldwide Repositories	LIS Repositories
USA	435(17)	17(14.2)
UK	219(8.5)	12(10)
Germany	168(6.6)	9(7.5)
Japan	143(5.6)	1(0.8)
Spain	109(4.3)	2(1.7)
France	82(3.2)	6(5)
Poland	80(3.1)	1(0.8)
Brazil	81(3.2)	4(3.3)
Italy	75(2.9)	3(2.5)
India	67(2.6)	5(4.2)
Others	1103(43.1)	60(50)
Total	2562	120

Table 2 shows the number of repositories in each Country. It is evident from the table that USA hosts highest number of repositories 435(17%) followed by UK having 85 (8.5%) repositories. There are 67 (2.6%) repositories in India hosted by different universities and R&D institutions. It also depicts Country wise distribution of LIS repositories, US is leading with 17 (14.2%) repositories followed by UK with 12 (10%) share. India has 5 (4.2) repositories having collection in the field of LIS.

Table 3 Open Access Repositories Software used		
Software Platform	Worldwide Repositories	LIS Repositories
DSpace	1066(41.6)	51 (42.5)
Eprints	373(14.6)	22(18.3)
[Unknown]	273(10.7)	12(10)
Digital Commons	119(4.6)	7(5.8)
Open Repository	71(2.8)	5(4.2)
Greenstone	55(2.1)	3(2.5)
HAL	24(0.9)	4(3.3)
Drupal	11(0.4)	3(2.5)
HTML	36(1.4)	3(2.5)
others	534(20.8)	10(8.3)
Total	2562	120

It is clear from the table 3 that D Space and E prints softwares are prominently employed to set up repositories worldwide and same trend is noticed in LIS field.

Table 4. Open Access Repository Type		
Repository Type	Worldwide Repositories	LIS Repositories
An institutional or departmental repository	2115(82.6)	95(79.2)
A cross-institutional subject repository	279(10.9)	17(14.2)
An archive aggregating data from several subsidiary repositories	95(3.7)	4(3.3)
A repository for governmental data	73(2.8)	4(3.3)
Total	2662	120

Table 4 reveals that majority of repositories are hosted by institutions of higher education to preserve their scholarly communications to showcase their research output.

Table 5. Operational Status of OARs		
Repository Status	Worldwide Repositories	LIS Repositories
Operational	2372(92.6)	98(81.7)
Trial	107(4.2)	11(9.2)
Broken- Technically malfunctioning	61(2.4)	9(7.5)
Closed- Not accepting depositions	22(0.9)	2(1.7)
Total	2662	120

Table 5 illustrates the status of repositories .It was found that most of the repositories are operational.

Table 6 Content Types in OARS Repositories		
Content type	Worldwide repositories	LIS Repositories
Journal Articles	1745(68.1)	88(73.3)
Theses and Dissertations	1395(54.4)	71(59.2)
Books, Chapters and sections	924(36.1)	47(39.2)
Unpublished Reports & Working papers	920(35.9)	51(42.5)
Conference and Workshop papers	885(34.5)	66(55)
Multimedia and Audio-Visual materials	608(23.7)	28(23.3)
Other special item types	445(17.4)	14(11.7)
Bibliographic References	430(16.8)	20(16.7)
Learning Objects	408(15.9)	19(15.8)
Datasets and Software	135(5.3)	4(3.3)
Patents	80(3.1)	2(1.7)

Table 6 gives the description of various publications forms in repositories. It also depicts that various categories of contents are archived in OARs but the main focus of the holdings is on journal articles.

Table 7 Most Frequent Languages in Open DOAR		
Language	Worldwide repositories	LIS Repositories
English	1813(70.8)	92(76.7)
Spanish	329(12.8)	9(7.5)
German	203(7.9)	10(8.3)
French	159(6.2)	6(5)
Japanese	144(5.6)	-
Portuguese	137(5.3)	6(5)
Chinese	107(4.2)	5(4.2)
Italian	76(3)	4(3.3)
Norwegian	51(2)	4(3.3)
Ukrainian	50(2)	4(3.3)
Dutch	31(1.2)	3(2.5)
Arabic	26(1)	4(3.3)
Russian	18(0.7)	2(1.7)
Hindi	8(0.3)	1(0.8)

Table 7 reveals that contents in English, Spanish, German and French language primarily found in substantial number of repositories.

Table 8 Meta data re-use Policies		
Metadata	Worldwide Repositories	LIS Repositories
Metadata policies unknown	116(4.5)	7(5.8)
Metadata policies not stated	47(1.8)	1(0.8)
Metadata Undefined, No Rights, Unclear Policies	1811(70.7)	75(62.5)
Metadata re-use permitted- Non-Profit	197(7.7)	10(8.3)
Commercial	113(4.4)	3(2.5)

Metadata Re-Use Policies adopted by repositories is shown in the table 8, it is observed that majority of repositories have undefined and unclear Metadata Re-use policies.

Table 9 Data [Full-text] re-use policies		
Full-text data	Worldwide Repositories	LIS Repositories
Full data item policies Unknown	110(4.3)	6(5)
Full data item policies not stated	46(1.8)	1(0.8)
Full data item policies explicitly undefined	1755(68.5)	75(62.5)
Harvesting full data items by robots prohibited	101(3.9)	5(4.2)
Rights vary for the re-use of full data items	89(3.5)	3(2.5)
Re-use of full data items permitted for not-for-profit purposes	167(6.5)	6(5)

It is evident from Table 9 that most of repositories i.e. 1755(68.5%) and 75(62.5%) not following defined Full text data reuse policies in worldwide and LIS respectively.

Table 10 Submission policies		
	Worldwide Repositories	LIS Repositories
Submission policies unknown	119(4.6)	6(5)
Submission policies not stated	44(1.7)	2(1.7)
Submission policies explicitly undefined or unclearly stated	1709(66.7)	69(57.5)
Submission policies defined	415(16.2)	19(15.8)

Table 10 reveals that repositories have undefined and unclear submission policies, however 415(15.8%) worldwide and 19(15.8%) LIS repositories have clearly defined their submission policies.

Table 11 Preservation policies		
	Worldwide Repositories	LIS Repositories
Preservation policies unknown	117(4.6)	6(5.)
Preservation policies not stated	525(20.5)	25(20.8)
Preservation explicitly undefined or unclearly stated	1456(56.8)	55(45.8)
Preservation policies defined	186(7.3)	10(8.3)

It was observed from Table 11 that only 186(7.3%) worldwide and 10(8.3%) LIS repositories have defined policy for preservation of contents, where as 56.8% worldwide and 45.8% LIS repositories do not have clear policies regarding the preservation.

Table 12 Growth rate of OARs		
Year	Worldwide Repositories	LIS Repositories
Before 2005	128(5)	10(8.3)
2005	310(12.1)	25(20.8)
2006	866(33.8)	57(47.5)
2007	1126(44)	56(46.7)
2008	1342(52.4)	59(49.2)
2009	1594(62.2)	60(50)
2010	1873(73.1)	73(60.8)
2011	2189(85.4)	88(73.3)
2012	2288(89.3)	96(80)
2013 till Jan 20, 2014	2562(100)	120(100)
Exponential growth rate	7.91%	9.15%

Table 12 depicts the comparative growth of world wide and LIS repositories and the exponential growth 9.15% is more in LIS field than 7.91% growth at worldwide level.

Conclusion

The findings reveals that there is less number of repositories categorized in the field of LIS throughout the world, but it is gaining momentum as exponential growth rate of LIS OARs i.e. 9.15% more than the overall growth rate of all disciplines worldwide i.e.7.91%.. LIS schools in Universities and other institutions must ensure their active participation in strengthening the LIS OARs. It was observed from the comparative analysis that LIS repositories follow the same pattern as the repositories in other disciplines worldwide in terms of country wise distribution, content types, OAR software used, OARs types, operational status, languages etc.

OARs are now noticeably accepted as essential & innovative vehicle for scholarly communication within the digital environment. Although the quality of digital preservation of scholarly content is one indicator of success, but collection size is also necessary for repositories to advance the open access. OA is gaining momentum in the area of LIS but it is still behind from the other disciplines. LIS professional can play a vital role in promotion and sharing of LIS resources for the development of knowledge through OARs.

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Managing Institutional Repositories in Open Access Environment: *Its Benefits and Challenges*

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This paper describes the management of institutional scholarly output by an institutional repository with their benefits and challenges for institution. In the ICT era an institutional repository play a vital role in scholarly communication to easily open access by academic and research community. The open access movement has spawned several initiatives, which in their own ways are changing the dynamics of information generation and faster dissemination. An Institutional repository (IR) is becoming one of the most popular platforms for self-archival and dissemination of an institution scholarly output. An Institutional repository facilitates the Management of institutional intellectual output in systematic manner and it's freely distribution. This paper discusses the requirements of hardware/software, staff skills and institutional policies to create and manage of an IR. This paper also highlights the Institutional benefits of an IR and describes the challenges to creation & managing of an IR in present scenario.



Institutional Repository (IR), Self-Archiving, Open Access, Scholarly Content, IR Management. DSpace.

1. Introduction

In the 21st century a large number of institutions in India although have established the IRs, but mostly institutions made them available only on the LAN through intranet of their institute or on a single computer due to institutional policy and copyright problem from publishers or reservation of their higher management to throw open their publications. The rapidly advent of social concepts like Open Access to Literatures, Self Archiving and technological advances like Open Archives Initiative (OAI), Open Source Software and reduction of storage costs are acting as catalysts to propel Institutional Repositories to the fore. Open access is being billed as the alternative to the traditional subscription-based, publisher-monopolized scholarly publishing model. The Budapest Initiative defines open access by stating "its freely available on public internet, permitting any users to read, download, copy, distribute, print, search or link to the full-texts of these articles, crawl them for indexing, pass them as data to software or use them for any other lawful purpose, without financial legal or technical barriers other than those inseparable from gaining access to the internet itself".

Open access requires no restrictions on how published material is subsequently used except to require that proper attribution of the work be given to the author and that authors retain control over the integrity of their work. In practice, what makes open access possible is that it is relatively inexpensive to distribute electronic articles on the Internet. Consequently, the open access movement focuses on various electronic publishing strategies.

Open access publishing takes two routes, i.e.:

- Open-access journal publication
- Open-access self-archiving

Self-archiving can be achieved in at least three ways: (1) putting articles on author Web sites, (2) depositing articles in disciplinary archives, or (3) depositing articles in institutional archives and repositories.[2] When an Institution or university self archives its intellectual output and knowledge base, it results in an Institutional Repository (IR).The paradigm shifts in the technological and social arena surrounding the information and knowledge cycle or generation of scholarly literatures, are indications of the radical shift towards institutional repositories.

2. What is an Institutional Repository?

Chang (2003) defines an institutional repository as a method for capturing, collecting, managing, disseminating, and preserving scholarly publications created in digital form by the constituent members of an institution. The term institutional repository was coined by Scholarly Publishing for Academic Resource Coalition (SPARC), and IR s has been defined by SPARC as 'digital collections capturing and preserving the intellectual output of a single or multi-university community (Crow, 2002). In simple terms, an institutional repository can be considered a digital collection of the intellectual output created by the workforce of an institution. An IR is defined to be a web-based database (repository) of scholarly material which is institutionally defined (as opposed to a subject-based repository); cumulative and perpetual (a collection of records); open and interoperable (e.g., using OAI-compliant software); and thus collects, stores and disseminates (is part of the process of scholarly communication).

It may be made accessible to users locally or globally with or without restrictions. We are concerned with the latter, i.e., open-access IRs, for the purpose of this article. These repositories may contain pre-prints/post-prints of research articles, research reports, conference papers, teaching materials, project reports, doctoral theses and dissertations, datasets resulting from research projects, committee papers, computer software, works of art, photographs, audio/video recordings, patents, standards and the like. The IR may cover content of which copyright is owned by the workforce or institution, or for which permission has been obtained from the publisher to include a copy of the content in the repository. Thus it follows that an IR should not contain content for which suitable copyright or licensing arrangements have not been made. The content of the IR is institutionally bounded, scholarly in nature, cumulative in growth and perpetual in access.

3. Objectives of Managing an Institutional Repository

In the digital age the mostly institutions of higher education all over the world are experiencing the necessity of an IR to create and manage of digital educational and research resources. There may be various reasons as to why an institution should go for the success IR approach that may include convenient collection, long term preservation of knowledge, immediate access to content and global distribution. The primary objectives for development and managing institutional repository are following:

- to building institutional profile and increasing institution image.
- to collection of all intellectual output (Phd. Thesis, dissertation, conference proceedings, research publications, project reports, annual reports and white papers, etc) of institution on single platform
- to long time preserve the intellectual output and institutional information of the institution in digital format for the next generation.
- to create global visibility or freely distribution for an institution's scholarly research.
- to provide open access to institutional intellectual output at global level by self-archiving it.
- to avoid the duplication and promotion of research works.
- to provide storage for the electronic publications of the institution
- to resource sharing at global level.
- to facilitate an open workspace for work-in-progress to promotion of research & academic works.

4. Software requirement to manage of an Institutional Repository

To creation and management of an IR there are a number of open-source software (OSS) like DSpace, Eprints, Greenstone, OPUS and Fedora and there are also available proprietary software services like Digital

Commons, SimpleDL, CONTENdm, Digi-tool, EN compass, Meta Source and VITAL. The other then the Digital library software we needed the web-based operating systems and application software like Unix, Linux, Windows, MySQL, SQL server, Apache, Tomcat, XML, JAVA and PERL. The comparative studies of some OSS digital library software's with their features are given in below table-1.

Table 1 - (Source: Sutradhar, ICDL-2013 proceeding, 585p.)

Features	GSDL	Eprint-II	Dspace	Fedora
Producer	University of Waikato	University of Southampton	MIT libraries and Hewlett-Packard	Comell University & University of Virginia
Open source	Yes	Yes	Yes	Yes
Operating System	Linux and Window	Linux	Linux	Linux and window
Web server	Apache/IIS	Apache 1.3	Apache 1.3/2.0 and/or Tomcat	Tomcat 2.4
Language	Perl	Mod-perl 1.0	Java 1.3, JSP	J2SDK v. 1.4
Database	Its own	MySQL	PostgreSQL 7.3	MCKoi v. 0.94 (uses by default) MySQL/Oracle 9i (optional)
Resource Identifier	No	OAI Identifiers (similar to URNs)	CNRI Handles	Uses own persistent identifiers (PID)
Dublin Core	Dublin Core	Dublin Core	Qualified Dublin Core	Dublin Core
METS	No	NO	Yes version 1.2	Yes
OAI-PMH v2.0	**Yes**	**Yes**	**Yes**	**Yes**
Subscription	No	Yes	Yes	Yes
Supported file formats	MS-Word, PDF, HTML, PostScript, JPEG, GIF	NS-Word, PDF, HTML, JPEG, GIF	NS-Word, PDF, PPTs, JPEG, GIF	NS-Word, PDF, HTML, PostScript, JPEG

Present time almost academic institutions/universities are using the Open Source software "DSpace" to create and manage of an IR. The DSpace is a digital library system designed to storage, index, preserve, and to redistribute the intellectual output of an institution/university in digital formats. It was developed jointly by Hewlett Packard (HP) Laboratories and Massachusetts Institute of Technology libraries. The DSpace architecture consists of three layers: application layer; business layer; storage layer. The application layer covers the interface to the systems, the web and user and interface and batch loader, in particular. The business layer contains the DSpace specific functionality, work flow, content management, administration, and search and browse modules. The storage layer was implemented using the relational database management system Postgre SQL. Each module has a well-documented API and all original code in the Java programming language.[16] OpenDOAR provides details of total 67 registered institutional repositories of India in which 58 IRs used DSpace. The list of registered Institutional repositories in OpenDOAR is listed in following table-2.

Table 2 - List of registered IRs at OpenDOAR

Repository name	Country	Num.	Base	Software
Open Access Agricultural Research Repository	India			Unknown
Architexturez South Asia	India	371	OAI	Architexturez
ARIES, Digital Repository	India	805		DSpace
DeepBlue Knowledge Repository@PDPU	India	115		DSpace
Delhi College of Engineering Repository	India	326		DSpace
Dhananjayarao Gadigil Library	India	1539		DSpace
Digital Knowledge Repository of Central Drug Research Institute	India	686	OAI	DSpace
Digital Library at Indian Statistical Institute, Bangalore	India	191		DSpace

Digital repository of Cochin University of Science & Technology	India	2405	OAI	DSpace
Digital repository of West Bengal Public Library Network	India	12845		DSpace
DigitalLibrary@CUSAT	India	6198		DSpace
DRS at National Institute Of Oceanography	India	4380	OAI	DSpace
DSpace @ GGSIPU	India	135	OAI	DSpace
DSpace @ sdmcet	India	60	OAI	DSpace
DSpace at IBS Ahmedabad	India	171	OAI	DSpace
DSpace at IIT Bombay	India	14099	OAI	DSpace
DSpace at Indian Institute of Management Kozhikode	India	530	OAI	DSpace
DSpace at IUCAA	India	2539	OAI	DSpace
DSpace at M S University	India	200		DSpace
DSpace at NCRA	India	84		DSpace
DSpace at Vidyanidhi	India	5482	OAI	DSpace
DSpace@IMSC	India	294		DSpace
DSpace@INFLIBNET	India	1280		DSpace
DSpace@NITR	India	1939	OAI	DSpace
DSpace@TU	India	2552		DSpace
eGyankosh	India	26996		DSpace
Electronic Theses and Dissertations at Indian Institute of Science	India	2209	OAI	DSpace
EPrints@IITD	India	2141	OAI	DSpace
IACS Institutional Repository	India	164		DSpace
IIT Roorkee Repository	India	1102		DSpace
Indian Institute of Astrophysics Repository	India	6230	OAI	DSpace
Indian Institute of Petroleum Institutional Repository	India	454		DSpace
Institutional Repository of Intectual Contributions of Delhi	India	841	OAI	DSpace
Kautilya Digital Repository at IGIDR	India	246	OAI	DSpace
Knowledge Repository of Indian Institute of Horticultural Research	India	482		DSpace
Knowledge Repository Open Network	India	828	OAI	DSpace
Librarians' Digital Library	India	490	OAI	DSpace
Management Development Institute - Open Access Repository	India	325	OAI	DSpace
National Science Digital Library	India	578	OAI	DSpace
NISCAIR Online Periodical Repository	India	22058		DSpace
Osmania University Digital Library [OUDL]	India	24506	OAI	DSpace
Raman Research Institute Digital Repository	India	5506	OAI	DSpace
ShodhGanga: A resevior of Indian Theses	India	11342		DSpace
Vidya Prasarak Mandal - Thane	India	1339		DSpace
Catalysis Database	India	2327	OAI	EPrints
CMFRI Digital Repository	India	9318		EPrints
DIR@IMTECH	India	1331		EPrints

DU Eprint Archive	India	170	OAI	EPrints
Eprint@NML	India	5648		EPrints
Eprints @MDRF	India	669	OAI	EPrints
Eprints@IARI	India	230		EPrints
ePrints@NII	India	10	OAI	EPrints
EPrints@NIRT	India	734	OAI	EPrints
Eprints@SBT MKU	India	89	OAI	EPrints
Etheses - A Saurashtra University Library Service	India	1016	OAI	EPrints
ICRISAT Open Access Repository	India	6717	OAI	EPrints
Indian Academy of Sciences: Publications of Fellows	India	91557		EPrints
Institutional Repository@CSIO	India	299	OAI	EPrints
IR@CECRI	India	2451	OAI	EPrints
IR@NPL	India	952	OAI	EPrints
National Aerospace Laboratories Institutional Repository	India	5608	OAI	EPrints
Open Access Repository of IISc Research Publications	India	36467	OAI	EPrints
OpenMED@NIC	India	2904	OAI	EPrints
Sardar Vallabhbai National Institute of Technology EPrints	India	14	OAI	EPrints
University of Mysore - Digital Repository of Research, Innovation and	India	8464	OAI	EPrints
Indian Institute of Management Kozhikode Digital Library	India			Greenstone
Mahatma Gandhi University Theses Online	India	1633		Nitya

Source: http://www.opendoar.org/find.php, (access on 04/01/2014)

5. Skills requirement to manage of an IR

In the ICT environment to create and manage of an institutional repository needed an IT expert personnel who manages the technical implementation, software installation, customisation, metadata creation and long time preservation of digital resources. In the higher education institution library make a separate division to create and manage of an IR and its services. The following skills and abilities of personnel (staff) are required for the creation and management of a successful institutional repository.

- Sound knowledge of digital library software (DSpace, Greenstone, Eprints, Ferdora) installation, setup client-server architecture and customisation etc.
- Applications knowledge of web-based operating systems and application software like Unix, Linux, Windows, MySQL, SQL server, Apache, Tomcat, XML, JAVA and PERL.
- Good knowledge of implementation of relevant metadata standards like Dublin Core, MARC-21 and OAI-PMH.
- Ability to develop a content policy for the institutional repository to include institutional scholarly output.
- Ability to plan and manage the institutional repository budget like hardware/software cost, old publication digitalization cost and human resources cost.
- Ability of formation of IPR policies for institutional repository to avoid the IPR issues

- Skill of develop workflows to manage the capture, description and preservation etc. of institutional repository elements.
- Skills of coordinate and manage activities of institutional repository like monitor deposit and download of digital resources and handle users comments and complaints.
- Ability to conduct users satisfaction survey and received feedbacks/suggestions to regular improvement of the IR services.
- Ability of liaison works with all departments and centres of institution to timely collection and submission of scholarly output.

6. Metadata Creation

To creation and development of a well institutional repository metadata creation is another aspect that tends to be a time and human resource guzzler. Metadata is "Data about Data". Actually, metadata is a set of descriptive and administrative metadata to each record, together with a persistent identifier. Present time Dublin Core metadata standard and OAI-PMH harvesting standard are widely used to metadata creation. Dublin Core metadata standard utilises a 15-element record. Dublin Core is widely used because it is indentified by the OAI-PMH to supporting harvesting into a commonly structured repository and discovery interoperability. Dublin Core standard unqualified metadata includes elements :

- **Title**—the formal name of the resource;
- **Creator**—a person or corporate author of a resource;
- **Subject**—the topic of the resource, best expressed using a controlled vocabulary or other formal classification scheme;
- **Description**—an account of the resource's content—for example, an abstract or table of contents;
- **Publisher**—the entity responsible for making the resource available;
- **Contributor**—a person or corporate contributor to the resource's content;
- **Date**—Date that the resource was created, modified, or made available;
- **Type**—the nature or genre of the resource;
- **Format**—the physical or digital manifestation of the resource (for example, media type);
- **Identifier**—an unambiguous reference to the resource, best expressed in a manner conforming to a formal identification system (for example, DOI, URI, ISSN, ISBN, ISMN, etc.)
- **Source**—the resource from which the resource is derived;
- **Language**—the language of the resource;
- **Relation**—a reference to a related resource;
- **Coverage**—the geographical or temporal scope covered by the resource's content;
- **Rights**—information about rights held in and over the resource, including intellectual property rights, copyright, etc.

7. Establishment of Institutional Repository at Central Library, D.E.I., Agra

Dayalbagh Educational Institute is famous educational institute for well disciplined and qualitative higher education. Dayalbagh Education Institute (Deemed University) has been given the status of Deemed University by the University Grant Commission of India in 1981. The Central library of the DEI is established in July 1984 by the governor body of institute. The primary mission of the central library is to support the research and curricular needs of faculty members, research scholars and students.

Now, the Central Library started creation and development of institutional repository using DSpace (A open source software) developed by MIT (Massachusetts Institute of Technology) in partnership between Hewlett- Packard (HP). The DSpace uses internationally recognized protocols and interoperability standards. The DSpace software is very useful to manage, preserve and retrievals of information in different formats. The DSpace also supports "Open Archives Initiative's Protocol for Metadata Harvesting" (OAI-PMH) and uses a qualified version of the Dublin Core schema for its metadata. The main objective of DEI Institutional Repository is to collection, preservation, faster dissemination and promotion of research outputs like PhD thesis, M.Phil dissertations, research papers, lecture notes and project reports submitted by teachers and students to central library. The central library also plan to digitization of old Ph.D. Thesis, Dissertations, Conference proceedings & project reports.

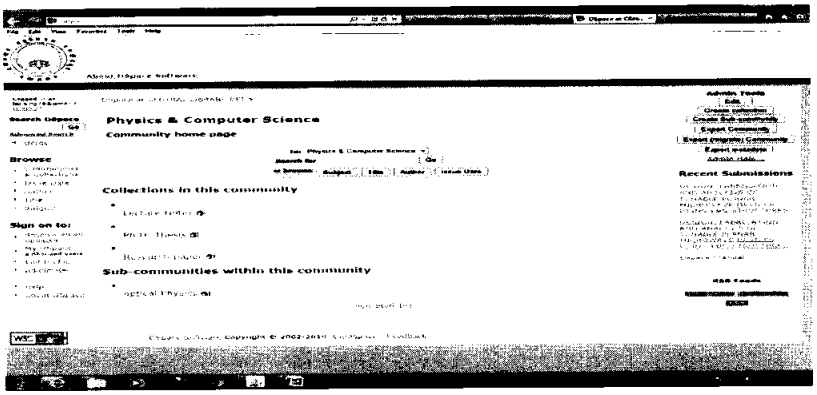


Fig.1: Communities and collections

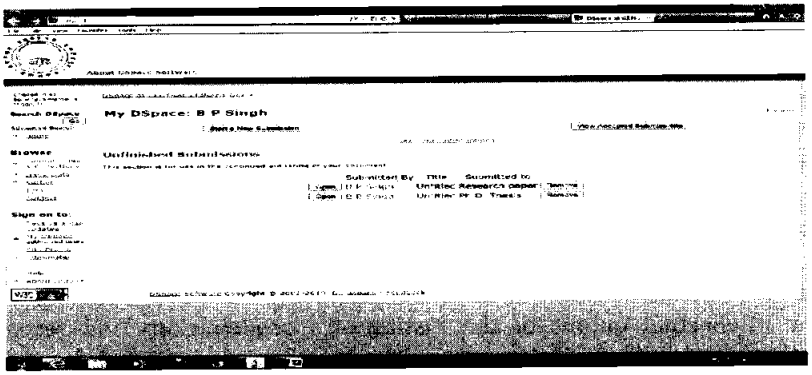


Fig.2: submission of collections

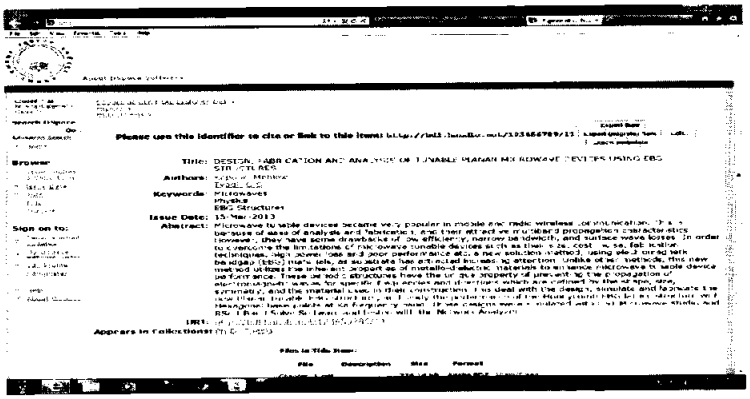


Fig.3 Searched item

8. Contents Management of an IR in educational environment

An institutional repository is a central digital repository of intellectual output of an institution/ university so that librarian's and authorities of institution are prepared a well policy to include the contents in the IR. An institutional repository can assume many forms and serve a variety of purposes as per the functions and policies of parent institution/university. A digital repository of the total intellectual output submitted by the faculty members, research scholars and students of an institution and it should be widely accessible to users. The contents of a successful IR in educational environment include the following:

- Annual reports
- Pre-prints of articles submitted for publication
- Post-prints articles/research papers
- Revised texts of published works
- Conference papers, PPTs, (audio and video)
- Lecture Notes
- Student projects
- Miner/Major project reports
- Technical reports
- PhD theses and M.Phil dissertations
- Computer program/software
- White papers (committee papers)
- Photographs and video recordings

9. Benefits of an Institutional Repository

An Institutional Repository is the intellectual hub of an institute/university which recognizes the intellectual output of academicians and researchers. Establishing and managing an institutional repository also enables an institution/university to publicise its research and academic programmes by enabling access to the work of its faculty, research scholars and students. In present scenario almost all institutions/universities also have institutional repositories to maintain the vast amount of scholarly output of institution/university. An institutional repository can be an efficient effective way of storing and making these documents accessible to authorised users.

In the digital age open access Institutional Repositories are open to global populace without any restrictions except that the user should have minimum e-infrastructures like Computer/laptop, tablet, telephone or leased line, and Internet connectivity for accessing IRs. The institutional repository mainly focuses on only the intellectual output of the institution's academicians and researchers to measure institutional productivity and increase its prestige. The benefits of an IR for the parent Institution are following:

10. Benefits of an IR for the parent Institution

- Raising prestige of institution
- Facilitates to users to usage of the information resources assets
- Collecting and managing institutional intellectual output on single platform.
- Long-term preserves of institutional heritage in digital format.
- Authorized innovative channel of scholarly communication.
- Provide access and visibility to the scholarly output.
- Preserve the scientific and academic knowledge of the institution for the future.
- Reduce the publication delay problem.
- Faster and effective scholarly communication.
- Save the library space and time of users.
- Facilitates 24x7x365 basis open access of publications at a lower cost.

11. Benefits for academicians and researchers

- Instead of scattered in different places, all the intellectual output of an academician/researcher are collected on single platform in a well organized order.
- An authorized platform to create and share of knowledge.
- Increase their audience.
- Maximize the visibility and citability of publications
- Faster and freely communication process,
- Promote quality and quantitative research and avoids unnecessary duplication of research works
- Facilitate immediate access of scholarly output on single platform.
- Increase the impact of the teaching and research work they carry out.

- **Benefits for the users:**

  - Easley open access on 24x7x365 basis from on or off campus.
  - Information searching by Title, Author and Keywords
  - Provide platform to learn, study and research.
  - No needs of extra training to searching of documents through IR.
  - User can browse, and downloaded relevant documents on an IR freely.
  - Also, an IR provides gray literature like teaching materials, unpublished documents and white papers can be accessed from the IR.
  - An institutional repository provide search in semantic manner.

12. Challenges to Create and Manage an Institutional Repository

In the rapidly changes scenario of ICT library professionals faces the many challenges to create and manage of an institutional repository. Actually, an institutional repository technology is a result of information storage, access and services using web technologies. In the creation and management of an institutional repository academic libraries are facing following challenges.

- **Intellectual Property Rights:** An IPR is a big challenge to create and manage of an institutional repository. It's is very difficult challenge to properly followed of intellectual property rights, especially copyright because almost published research output of institution are copyright protected. Therefore, before create and manage of IR parent institution/university make a well IPR policy to uploading and downloading of documents from an IR. Basically it will be necessary to implement IPR policy of the institution to create and manage of IR. The following aspects should be considered.
  - The kind of document to be included.
  - The legal rights of the document.
  - Authorisations to make the contents public.
  - Restrictions to be applied on the information.

- **Lock of Infrastructures:** To create and manage of an IR we are faced the challenges of inadequate e-infrastructure due rapid changes in technology and shortage of fund. Create management and access to an institutional repository requires access to adequate ICT facilities, especially client-server based infrastructure, Internet and intranets through which access to the digital resources is provided. Although Internet access is now widely available on the continent, the speed and reliability of Internet connections is a major challenge faced by most institutions (Chisenga, 2006).

- **Lack of Expertise/inadequate staff:** In many institutions/universities to create and manage of an IR librarians faced challenges of lock of expert personnel due to rapid advances in ICTs and its applications. The lack of expertise is one of the most impotent challenges to create and manage

of an institutional repository in various institutions/universities. It has been observed that a large number of institutions, especially state funded institutions in India, including universities, deemed universities and technical institutes, don't have the expert staff with relevant ICT skills to create and manage of digital institutional repositories. Therefore, it is time to change and development of ICTs skills for library professional to provide digital library services at global level.

- **Financial Shortage:** In the developing countries many institutions/universities also facing challenges of finance shortage to create and managing an IR. In present scenario qualitative e-infrastructures (High performance server, computers, high resolution scanner, communication devices, printers etc) and digitization of documents are very costly. So, many institutions/universities are doing wait for special grant of large amount from government to its creation, management and it's widely dissemination. It's observed that financial management is a challenge for library professionals to create and manage of an institutional repository.
- **Lack of Higher Management Support:** To create and manage of an institutional repository in the institution's/universities another big challenges is don't fully support of higher management due to institution/university policies. In India almost institution's/universities manages their IR on LAN through intranet or a single computer because higher management not permitted to Librarian/IR manager for providing its accessibility on internet. In some institutional management don't provide well infrastructures and fund to create and manage of an Institution repository.

  Other then above describes challenges some challenges are:

  - Poor connectivity/low speed of internet
  - Poor sensitization
  - Long term preservation and access.
  - Publisher's monopoly.

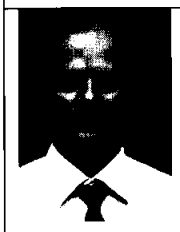
13. Conclusion

Institutional repositories are being embraced a whole lot of academic and research institutions across the world, because of the various benefits they offer. Creation and development of institutional repositories and publishing of open access journals is very imperative, so that the academic and research information reaches all. In the digital age Institutional Repositories act as invaluable tools to enable creation, sharing, widely access and reuse of information resources. They collect digital scholarly output (pre-prints, post prints, theses, technical reports, grey literature, learning material and other digital material) and are hosted on a network. Institutional Repositories capture intellectual output or in other words the knowledge capital of the researchers and academicians of an institution and strive to make it available in the open access environment and thus make global access to local information possible. Plethoras of OSS (Open Source Software) are available to enable personnel to set up institutional repositories like Eprints, Greenstone, DSpace, Fedora, CONTENTdm, CDS-Ware etc. Through this paper various benefits of repositories outweigh the management/technical challenges of hosting repositories. In the present scenario self-archiving needs to be promoted in a well way to populate repositories. An institutional Repository serves two main objectives: it allows authors to disseminate their research papers for free over the internet, and it helps to ensure the preservation of those papers in a rapidly evolving digital environment. Well e-infrastructures, metadata, copyright, good quality control, peer review has to be looked into closely so as to make the repository management successful. Library professionals will challenge to plan strategies to deal with new structures of scholarly communication to academic and research community of users.

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Open Access and Educational Resources: *Sustainability in Digital Era*

Sudesh Kumar Sood **Sudhir Kumar Gupta**



An open access and educational resource. This is a new phenomenon of 21st century digital era which helps in lifelong learning. This paper depicts the situation and initiatives of OER in India, major issues relating to OER and recommendations for its promotion. We have come to conclusion that though there are a growing number of OER initiatives, but copyright and IPR (Intellectual Property Rights) and sustainability issues continue to dominate. Keywords: Open Access Resources, Open Educational Resources, Copyright & IPR, Sustainability.



Open Access; Free Access to Law Movement; Open Access to Law Resources

1. Introduction

The development of the information society and the widespread diffusion of information technology give rise to new opportunities for learning. At the same time, they challenge established views and practices regarding how teaching and learning should be organized and carried out. Higher educational institutions have been using the Internet and other digital technologies to develop and distribute education for several years. Yet, until recently, much of the learning materials were locked up behind passwords within proprietary systems, unreachable for outsiders. The open educational resource (OER) movement aims to break down such barriers and to encourage and enable freely sharing content.

The OECD Centre for Educational Research and Innovation (CERI) has already addressed a number of issues regarding e-learning in higher education, publishing reports on E-learning: The Partnership Challenge(OECD, 2001) and E-learning in Tertiary Education – Where do we Stand?(OECD, 2005). The second of these reports concluded that e-learning is becoming increasingly prominent in tertiary education. All available evidence points to growing enrolments and provision, although from a low starting point. E-learning activities across tertiary education institutions are very diverse, from trivial online presence to programmes offered fully online. Modules accounted for the majority of e-learning activities, reflecting the dominant characteristic of e-learning as supplementary to on campus delivery at undergraduate level. Learning objects were said to be viewed as a promising way forward as they can potentially cut costs and revolutionize pedagogy. Some of these issues are further analyzed in this paper.

2. What are open Educational Resources?

The definition of OER currently most often used is "digitized materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research". OER includes learning content, software tools to develop, use and distribute content, and implementation resources such as open licenses. This report suggests that "open educational resources" refers to accumulated digital assets that can be adjusted and which provide benefits without restricting the possibilities for others to enjoy them.

3. Open Access Resources Initiatives (OAI) in India

Open Access is a term used to describe published academic papers, books, reports, and other periodicals that are electronically available to readers without financial or technological barriers. The importance of open access for fundamental as well as applied research and education cannot be over emphasized. Only a small proportion of the information generated throughout the world is in the open access domain. Majority of the world population cannot access the research findings from the developed nations, where most of the cutting edge research is being conducted, because of the financial constraints. At the same time, research conducted

in third world countries representing 80% of the world's population is largely invisible to the global research community due to financial and governmental restraints. Yet, solving many of the world's problems like emerging infectious diseases, the HIV/AIDS epidemic, environmental disasters, or climate change cannot be achieved without the participation and incorporation of research conducted in developing countries as well.

Open Access will help scientists around the globe to develop collaborations with previously unknown colleagues and avoid repetitive research while tackling major regional problems. Open access increases the usage and citation of the published research. Recent studies have shown that Open Access articles are cited 25 - 50% more than non-Open Access articles from the same journal and year. The researchers are benefited due to the Open Access policies as their research work gets widely disseminated and can be read by anyone with Internet access without any restriction. Similarly books, articles, and art forms will enjoy worldwide patronage when available in open access domain. Published books out of copyright protection are a prime target for Open Access to help disseminate vital information contained in these books. In India, there are a large number of these books but they are held in a few libraries scattered across the country and their content is not widely available to the scholars and students of our country.

Open Access will drastically change the availability of these books and the knowledge contained in these texts. Electronic, searchable versions of the books will be greatly helpful in translating the content into other Indian languages, increasing the book's scope past its original text. The NKC has earlier recommended on the formation of a translation mission and translating Indian language books to other Indian languages and English. This will also reduce the skewed nature of libraries in India. Currently, major libraries only exist in urban areas and rural India doesn't have access to the resources present in these large libraries. Open Access remedies this problem by allowing socially and economically disadvantaged individuals to access all the information if there is a free internet connection.

In recent years, Open Access is becoming a movement in a few countries. There are 761 registered Open Access repositories at the present time. In the Open archives, there are several million searchable records and are presented in a standard, interoperable, and searchable Open Access format. The number of usable records is increasing every day as more and more countries are adopting OA policies. Similarly, a number of scientific journals are also increasingly available from different countries around the world as OA material. For example, a number of journals from the United States, Europe, and even Latin America are available in open access. Many African countries have also started to put their journals in Open Access. Recently, Germany has created a national web portal for Open Access materials. In addition, many countries are making digitized books available to the public. China has digitized more than 600,000 books so far. The United States, under the Carnegie Mellon University's Million Books on the web Project, as well as Google Inc, has digitized several hundred thousand books that are available under Open Access.

India has done fairly well in the Open Access area by making 81 scientific journals accessible under OA. The Indian Institute of Science, Bangalore, is coordinating the Digital Library of India project along with Carnegie Mellon University. In this project, 21 other Indian institutions are also participating and have digitized more than 450,000 books, out of which 220,000 books are now web-accessible. This digital book collection includes the entire collection of the library in the Rashtrapati Bhavan. The books thus far digitized are from a variety of languages such as Sanskrit, Telugu, Tamil, Marathi, and Hindi to name a few. Furthermore, several Indian newspapers, both in English and regional languages, are available in Open Access. Similarly, a large number of government reports, including those of NKC, notifications, and Supreme Court opinions are available to anybody with internet access. The lack of awareness among potential users and broadband connectivity are impeding the growth of Open Access material in India. Insufficient government funding and the absence of helpful policies have further constrained Open Access's ability to reduce the cost and improve the quality of research and human development in India. On a technological front, new methods for the digitization of printed material and converting it into a searchable database need to be developed as the fonts used in old books, journals, and manuscripts cannot be directly converted into ISCI/ASCI using our standard Optical Character Recognition (OCR) programs.

The working group, after taking into consideration the current status of Open Access in India and worldwide, has the following recommendations to increase Open Access content from India, increase the public awareness and utilization of OA material.

- On a policy level, all research articles published by Indian authors receiving any government or public funding must be made available under Open Access and should be archived in the standard OA format on his/her website. Further, as a national academic OA portal is developed, these same research articles should be made available through this portal.
- The government should allocate specific funding to increase the current digitization efforts of books and periodicals which are outside copyright protection.
- Separate funding should be allocated to develop a new higher quality OCR software package so that new and old fonts in many different Indian languages can be converted into ISCI/ASCI code.
- A training program needs to be developed to take the materials available under Open Access to remote towns and villages. One possible mechanism for this is to outfit a vehicle with mobile internet connectivity and a high speed printer and binder. With these resources, the "OA" vehicle could travel to rural locations, print and bind the book or material requisitioned by the users at the location, and charge the users only the cost necessary for printing and binding.
- On a systemic level, our nation's universities and various academic institutions need high bandwidth connections and a national backbone which will provide advanced networking capabilities. There is an urgent need to develop Indian Research and Education Network/ Knowledge Network where each connected institution will have at least 100 Mbps or 1 Gbps connectivity. This level of connectivity will not only advance the OA activities nationally, but provide global connectivity as well. Soon, the NKC will provide detailed recommendations in this regard.

4. Copyright and Intellectual Property Right Issues

Copyright law takes its definition from international conventions and is similar in most countries. Copyright primarily serves an economic function by granting creators monopoly rights in their creations for a limited time. While information technology makes it possible to multiply and distribute content worldwide and almost at no cost, legal restrictions on the reuse of copyright material hamper its negotiability in the digital environment. Frustrated by this obstacle, academics worldwide have started to use open licenses to create a space in the Internet world – a creative commons – where people can share and reuse copyright material without fear of being sued. To do this, copyright owners have to agree or give permission for their material to be shared through a generic license that gives permission in advance. The Creative Commons license is by far the best-known license for such content, the use of which is growing exponentially.

Intellectual property issues are at the heart of OER. It was suggested that the issue of copyright and ownership of material is 'the root cause of slow development in this field' inhibiting some faculty members and institutions from making more educational content available to the online community. The key issue is to find the right balance between 'open material to all with no control' and 'open to no one' (Yuan 2008). Although, many academics are willing to share their work, they are often hesitant as how to do this without losing all their rights. Although some people release work under the public domain, it is not unusual that authors would like to retain some rights over their work. Several open content licenses have been developed, like the Creative Common and the GNU free Documentation License, to accommodate this problem. Open licensing provides a way of controlled sharing with some rights reserved to the author. They have the benefit of introducing certainty and clarity into the process of obtaining permission to use the work of others. They also reduce the administrative burden of having to clear rights before use. Learning commons, a new division of Creative Commons will provide advice and expertise to the OER community to overcome technical and cultural obstacles and identify lesson learned (Yuan 2008)

5. Sustainability

The impact of implementation of the working group recommendation can be felt only if the sustainability of the programs is ensured. The development cost of open educational resources materials is high, but the much higher translatable, measurable rewards resulting from an expansion of the OER universe makes it a clear case for the government to ensure its sustainability. Initially, the government can create a grant for the generation and distribution of OER material to students and teachers from all over the country. Private industry should be the second major source of funding for developing OER on an ongoing basis since the industry stands to benefit immensely from the improved quality of education. Private industry should be offered tax credits in return for funding and developing OER content. These partnerships with private industry will help defray the costs of development of OER material. India's Open Access project cannot be modeled after any of those which have been tried out by different countries. India will have to design and develop its own unique model that suits its needs and the available resources. The working group suggests the following model to continue and expand the number of research papers being put in Open Access.

The publishers of any Open Access journal will recover the cost of publishing and maintaining the journal on the web from the individual authors. Thus, the authors have to pay for each research article that they publish in such journals. To make this possible, the authors' parent institution should pay the publication cost. The institution should get a certain percentage as reimbursement through government grants depending upon the citation index of the journal. The institute will get more than 100% of the cost it has incurred if the paper is published in a journal with high impact factor. In this manner, the author will not have to pay from his/her personal funds or grant money and at the same time there will not be too high a financial burden on the authors' parent institution. As such, the government will ensure that India's research scientists publish high quality papers. A second model could be that the government establishes a specific fund for Open Access research publications. At the end of each fiscal year, money should be transferred to each OA journal depending upon the number of papers published by Indian authors..With these two initiatives, the government would have provided incentives for authors to produce high quality papers and given journals a reason to publish within the OA universe.

6. Expectations

No government program should be created, researched and supported unless all involved parties have an understanding as to what the long run possibilities are for the program. Once India embraces the concept and expands on the available Open Access and Open Educational Resources, the intellectual development of the nation will be accelerated. It is reasonable to expect that after 5 years of full implementation of the above suggestions, everyone in rural and urban areas will get the same quality training at a level that far surpasses what is given today. This will be possible since the OA and OER resources will create higher quality teachers with a new benchmarking standard for themselves. Along with the benchmarks that identify successful teachers, the OER and OA content will help teachers change their overall pedagogy for teaching. As the nation's teachers get better, the students will become better students. One of the expectations from the exercise of making world class teaching material and methods available to the teachers and students freely, is that the students will develop the skills critical to the creation of new knowledge and advancement of technology that are necessary to maintain the tempo of economic growth. These skills include the ability to define the problems precisely, design the solutions that are right for the country and develop those solutions indigenously. Better teachers with the help of contemporary material will create better students that are naturally inquisitive about their local and global surroundings with a thirst for learning as opposed to the current paradigm of students being spoon-fed data and information about a certain topic.

An additional benefit of adopting the above recommendations is a much larger student base for India. Currently, many rural and socio-economically disadvantaged students cannot gain access to any higher education institutions because the overall cost is much too high. With the inclusion of Open Access and Open Educational Resources materials, the cost of providing education to these students comes down drastically.

Moreover, these and other students will have access not only to specific higher education, but also professional education, the key to social and economic mobility. If the lower strata of India's population have the possibility for social and economic mobility, then the overall growth of the country is inevitable.

7. Conclusion

Although, there are a growing number of OER initiatives and more and more institutions and individuals are sharing their digital learning resources over the Internet freely and openly. The importance of open access for fundamental as well as applied research and education cannot be over emphasized. Open Access remedies this problem by allowing socially and economically disadvantaged individuals to access all the information if there is a free internet connection. Once India embraces the concept and expands on the available Open Access and Open Educational Resources, the intellectual development of the nation will be accelerated.

There are many major issues surrounding access, quality and costs of information and knowledge over the Internet as well as on provision of content and learning material are emerging. Copyright and IPR issues continue to dominate the OER initiative. Sustainability of OER is another major issue. Hence, there is a need for institutions, organizations and governments to share common interests and innovative approaches in providing open access to educational material thereby achieving economic efficiency and raising the quality of teaching and learning in higher education through a global endeavor.

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Open Access Movement: A New Paradigm in Scholarly Communication in Higher Education in India

Chetan Sudhakar Sonawane



Open access (OA) simply means the removal of barriers for accessing scholarly work. In the Open access (OA) movement scholarly literature is made freely accessible to public and hence it is also called as public domain documents. The Open access (OA) movement has taken rapid pace due to the advancements in Information and Communication technology (ICT) which has enabled easy access to scholarly information relating to higher education and is also assisting in research. Using the latest available technology high quality global educational resources can be shared by the means of OA. Internet has played a vital role in delivering scholarly information to the user community. This article focuses on how OA can help resolve the problem of maximising the visibility, and thus the uplifting and usage of Indian research outputs. It also stresses on how self archiving can help in enhancing the open access movement.



Open access, ICT, Scholarly information, Internet.

1. Introduction

India's economic growth as well as scientific growth has been witnessed by the developing world as well as by the South Asian countries. India is moving toward economic and social development with massive demand for quality higher education opportunities. India has the potential of being the global technology leader. This has made possible due to the success of technical education. Scholarly communication can be simply defined as the various means by which the research outputs are communicated in academia. Access to scholarly information is emerging as major issue as the output of research is usually published in form of journals and then there are lots of problems in accessing academic journals, research collections, and other print publications. The major problems are huge subscription cost of these scholarly journals. But due to the recent advancement in information and communication technologies, especially the Internet and the Web has revolutionaries' scholarly communication, leading to innovation in conduct of research as well as in the conveyance of ideas to readers. Electronic resources[1] are emerging as indispensable information channel for research community and as a major source of scholarly communication. Research community is looking at electronic resources with great expectation. But despite of availability of huge stack of information, access to information is becoming more restricted; hence there is no use of such wide range of information until it is used. A large number of users remain deprived of information and day by day the gap between information poor and information rich is expanding.

2. Need and Importance of Open Access

- **Shrinking Library Budgets:** Due to the increasing cost of reading materials Library budgets are almost shrinking and are unable to cope with the accelerated pace of information generation. Though the number of journals being published is increasing day by day, the number of journals being subscribed is reducing day by day due to the cost factor. In developing countries most institution hardly subscribes to even the important core journals and only a fraction of these journals are subscribed.
- **Higher Subscription Rates:** Due to the hike in the subscription charges of Journals in particular scientific journals several studies have been conducted to understand how the expenses can be controlled. Though it was reiterated that inflation was responsible for the increase in subscription rates the subscription charges rose much higher than general inflation rates.

- **Constant change in Foreign Currency:** Due to the constant fluctuation in foreign currency subscription to International journals is getting more and more complicated by currency fluctuation and conversion rates between countries.
- **Quality Content:** Peer reviewing of Journals enables the maintaining of quality of the articles being published in the Journals. But this practice of peer reviewing led to the increase in cost of Journal adding to the problem.
- **Users Need:** User's needs are becoming narrow, complex and interdisciplinary and hence their expectations are also growing.

3. Open Access Movement: An Indian Scenario

In India a large number of scholarly journals are published in print as well as in online form covering various subjects. At present there are more than 150 open access journals in India. The Open Access movement in India is initiated by six journal publisher, namely, Indian academy of sciences, Indian national science academy, Indian medlars centre of national informatics centre, Medknow publications, and indianjournals.com and Kamla raj enterprises. Details of these publishers are given in Table.1. Some of these Journals ask for user registration as a prerequisite for accessing these journals, while the others provide the search facility for the search of articles by the name of author or by keyword.

Table 1: Major publishers of Open Access Journals in India

Name of publisher/ host organization	No. of journals	URL	Registration required	Search facility	Subject areas
Indian National Science Academy	8	http://insa.ac.in	Yes	Yes	S & T
Indian Academy of Sciences	11	http://www.ias.ac.in/pubs/journals	No	Yes	S & T
Indian Medlars Centre	38	http://medind.nic.in	No	Yes	Medicine
MedKnow Publications	41	http://www.medknow.com/journals.asp	Yes	Yes	Medicine
Indianjournals.com	9	http://www.indianjournals.com	Yes	Yes	S&T, Medicine, Social Sciences
Kamla-Raj-Enterprises	7	http://www.krepublishers.com/KRE-New-J/	No	No	Science & Humanities

S & T = Science and Technology

4. Open Access Communication medium

It is necessary to find different ways to communicate precious scholarly output of good quality using the latest available technology. Presently a number of such initiatives can be witnessed in abroad and also in India. Open Access initiatives can take the following forms:

- **Open Access Journals: also called as Golden Road to Open Access:** Open access journals (OAJ) can be defined as electronic Journals, which are peer reviewed and can be accessed in freely in public domain. A Journal can be termed as Open access only if all articles in that journal are freely available. OAJs pay the cost of publishing through one of three basic economic models: Article processing fee/submission charge to author or author institution; advertising or corporate sponsorship; or subsidies and grants. These are also free from many copyright and licensing issues. A few initiatives of OAJ are given below:
- **Directory of Open Access Journals (DOAJ):** A Directory of Open access journal is maintained at Lund University Library in Sweden (www.doaj.org). There are currently 7,066 journals listed. Some

of them charge a 'front-end' publication fee which the author institution or grant normally pays. Other doesn't charge a fee but have some other business model that enables them to run the journal without charging a subscription. The web of science lists some 10,000 open access journals of the highest impact factors.

- **Open Access Repositories: Green Road to Open Access:** In this self archiving is done, in this author provide free access to their own published or unpublished own articles. Open Access Repositories are either centralized subject based depot or are broad based institutional depot for electronic article. They are in accordance with the set of standard (OAI-Open Access Initiatives) and are interoperable forming in effect a worldwide database of research. Google and Google Scholar index Open access repositories so any article in it can be seen easily. This can be done by:
  - Research related archives (e-print) servers,
  - Institutional repositories of Individual universities/institutions and
  - Self posting/archiving on author's home pages.

5. Institutional Repositories in India

An Institutional repository is a database, with a set of services to capture, store, index, preserve and redistributing an institutional scholarly research in digital format. The Indian[3] Institute of Science was the first in the country to setup an interoperable institutional achieve (eprint@IISC). The archive has 29,859 publications in the repository. Similar efforts have been made by other institutions like Indian Institute of Management, Kozikode; Indian Statistical Institute, Bangalore; Indian Institute of Technology, Delhi, National Institute of Technology, Rourkela; National Aerospace Laboratory, Bangalore; National Chemical Laboratory, Pune; Information and Library Network, Ahmedabad, National Institute of Oceanography, Goa; Raman Research Institute, Bangalore etc.

6. Advantages of Open Access Movement

Removing[1] access barriers to scholarly literature will boost research, enrich education, share the learning of rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge. Advantages of OA are as follows:

- Researchers get enable to search, access and use the information produced worldwide.
- Author can make their work more visible and accessible, thus increasing their impact with Open Access.
- It is the most economical solution for getting recognition as well as access to Scholarly literature throughout the world.
- OA helps in eradicating the cause of cost as well as copyright in accessing information.
- OA movement is supportive for human quest for lifelong learning.
- It is a low cost solution for spread of scholarly literature.
- The advancement in OA provides the opportunity for teachers and students from rural areas to learn from these high quality resources and improve the quality of education.

7. Scope of Open Access Movement in India

- The Success of Open Access Movement depends on the factors like the fast and reliable internet connection as well as good hardware and software infrastructure.

- Poor connectivity of internet broadband connection is hampering the growth of Open Access material in India. High cost of internet broadband poses an obstacle for developing countries like Indian to meet the expense of ample bandwidth.
- The major problem being faced by developing countries in actively participating in OA movement is lack of funding. Fiscal supplies are needed to meet operating cost involved in developing institutional repositories, adequate ICT infrastructure and enough bandwidth.
- Another major problem is lack of awareness among the users in exploring the vast opportunities of the OA needs efficient advocacy in form of training programs to take the materials available under Open Access to remote town and villages.

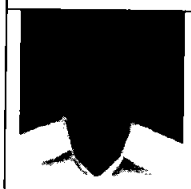
8. Conclusion

Importance of Open Access archives, institutional repositories and open access journals has been realized by Library and Information professionals in IndiaThe research institutions of India are actively involved in the development of institutional repositories. Indian Institute of Science, Bangalore, INLIBNET Centre, Ahmedabad and Documentation Research and Training Centre (DRTC), Bangalore are leading institution with major contribution. Open access journals and institutional repositories are two important means for delivering open access to research literature. India is not only leading in open access movement of the developing countries, but also making developed countries aware of qualitative scholarly literature originating from these countries. Most of efforts are continuing to set up open access archives or institutional repositories. In future sustainable growth of open access archives and journals will be seen in India.

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Trends and future perspectives of Indian Institutional repositories: *An Analytical Study*

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The main purpose of this research is to study the current trends of Indian IR's and to study the various issues concerning the software involved in development of IR's.It was observed that 38.98 per cent of IR's are implemented by R&D institutions of India. Karnataka and Haryana states were having highest number of IR's,and also it is observed that 63.56 per cent of institutions are using Dspace open source software package and maximum institutions are using the IR's to promote and preserve the research publications.



Institutional Repositories, IR, R & D Institutions, Open Access

1. Introduction

Institutional Repository is a digital archive of the research output created by the faculty, research staff, and students of an institution and accessible over the internet to end-users both within and outside of the institution, with few if any barriers to access. As a facility it consists of hardware, software and procedures to capture, organize, archive, disseminate and mange digital research resources of the institution. IR's provide a simple, web-based mechanism to researchers to deposit (Self-archive) and access their research publications.

There are many benefits that can accrue from the creation and implementation of institutional repositories. One is that the institute or university will be able to maintain a centralized collection of its output. This obviously depends on the type of IR – whether it is for research outputs (thesis, dissertations, working reports, published papers etc.) or for entire institutional output beyond the academic and research based. This means that output that is of value, and that would otherwise be lost to the institution is compiled and made available for current and later use by members of the institutions and indeed others who might have an interest. Generally universities and research institutions produce a lot of output materials that may not be published and therefore accessible.

An institutional Repository is an online locus for collecting, preserving, and disseminating the intellectual output of an institution, particularly a research institution. For a university, this would include materials such as research journal articles, before and after undergoing per review, and digital versions of thesis and dissertations. It might also include other digital assets generated by normal academic life, such as administrative documents, course notes, or learning objects.

An institutional repository consists of formally organized and managed collections of digital content generated by faculty, staff and students at an institution. The content of these repositories can be available for integration with on-campus library and course management systems, and can also be made available to colleagues and students at other institutions, as well as to the general public. A convenient definition is a "digital collection capturing and preserving the intellectual output of a single or multi-university community" (Crow).

2. Objectives of the Study:

- To know and enumerate the Institutional Repositories in India
- To analyze the 118 IRs based on selected study criteria, as follows
- Types of institute,
- Regional wise implementation,
- Statues of Indian state,

- Software used for repositories,
- Year of implementation,
- To compile the web directory of IRs.

The study hopes to enlighten awareness of Institutional Repositories being developed in India and its contribution to a global knowledge base.

3. Research Methodology

Total 118 Institutional Repositories was selected and browsed for the present paper. The data related to the institutional repositories have been collected from their respective websites, and other secondary sources like OpenDOAR and ROAR web directories. The data is analyzed based on selected parameters like software used for repositories, types of institutions, statues of Indian states, year of implementation and related its future prospective.

4. Review of Literature

Takagi Kazuko (2005) revealed the evolution of institutional repositories and given good examples of open source software's. They have also focused on policies of self-archiving, emerging search engine to enhance open access via institutional repositories. Mary Westell (2006)finds that the success of institutional repositories based on their demonstrated integration with research initiatives provides picture of the selected institutional repositories through a evaluation of their presence on web and their combination with Universities, Libraries and research pages. AshalathaLaxminarsaiah and Rajgolilqbalahmad U (2007) states that how the institutional Repositories will built from scratch and how different collections with numerous forms and formats can be accommodatedby using Dspace Software. Anil Kumar Dhiman and Hemant Sharma (2008) states that institutional repositories are made available the archival collections over networks to its users and also provides organisations output in digital format for quick access to the users. Rekha Mittal and Mahesh G (2008) are attempts to recognize and assessthe digital libraries and institutional repositories in India available for use. They also have given the comprehensive list of digital libraries and institutional repositories of India. Kgomotso (2009), In general, most IRs is based in colleges and universities, although they do to a lesser extent exist in government agencies. In most universities, these IRs are spearheaded and manned by university libraries. When IRs was first mooted, the major consideration was to address the rising serials costs and provide another avenue for scholarly research. Some through saw IR's as a means of providing management and preservation of research output. Sarika Sawant (2011) did the comprehensive study focuses on the system and software aspects of the institutional repositories and also they have identified the 16 working institutional repositories and some of which are not listed in the OpenDOAR or ROAR.

5. Key issues in developing repositories

Some of the key issues to consider when developing repositories are the institutional culture

- The scope of the repository
- Content
- Access levels
- Legal aspects
- Standards
- Sustainability
- Funding

Institutional culture depends on how the organization is structured as well as how much collaboration and trust exists within an institution. In academic organizations, faculty belongs to departments, disciplines and research groups. Academic competition may be fiercer in some universities than in corporations. In an

internally competitive environment where cooperation and trust are not nurtured, building a repository will become more difficult. Faculty will not contribute willingly to a central repository unless they have been consulted and trust the process. Faculty need to be convinced that contributing to a repository will enhance their reputations in their disciplines and result in wider dissemination of their work.

6. Overview of existing Indian scenario

India is in the forefront of developing world as well as in South Asian region both in terms of economic growth and scientific productivity. Research and Development (R&D) institutions and higher learning institutions in India are engaged in advanced studies, leading to development of new applications, new techniques, new products and new technologies. The R&D organizations have also developed expertise in their respective areas that are now recognized worldwide. Such institutions are now collaborating with world's leading institutions with varying degree of partnerships. Leading Indian scientific institutions, such as Indian Institute of Science (IISc), Indian Institute of Technology (IITs), Indian Statistical Institute (ISI), institutions under the Council of Scientific and Industrial Research (CSIR) and Indian Council of Medical Research (ICMR) now have considerably greater in-flows of sponsored research, supported by industries, enterprises, as well as international and national funding agencies. The associated problem is mainly related to the accessibility of literature. The reason is primarily shrinking budget.

There is paucity of funds for the primary literature, i.e. subscription based scholarly journals. The subscriptions of scholarly periodicals, especially the high impact journals are also increasing very rapidly, at the same time library budgets almost remained same. The scholar's preference to publish in high impact journals for recognition in the elite world demands the necessity of acquiring such literature in the library. Here open access literature can play a vital role, both in terms of research communication and access, provided of course the benefits in terms of economic and social recognition are assured by this system. The ICT infrastructure necessary to take advantage of the open access is not adequate in developing countries, as are apparent in many cases.

7. Current IR Developments in India

In India, the efforts towards adopting open access initiative have already been started. But there are some hurdles and misunderstandings about open access among the Indian research community. These are:

- Lacks of expertise in every organization to promote creation of institutional archives and encourage scientists to place their papers in them.
- Lack of infrastructural facilities like hardware and connectivity of high bandwidth.
- Scientists are under the impression that the editors of renowned journals may not accept the archived papers.
- The scientists are not aware of the fact that the attitudes of the journals are now changing and renowned journals also permit the authors to archive both preprints and post prints.

8. Analysis of Data and Discussions

Table - 1 Institutions wise Distribution

Sl. No.	Type of Institution	No. of IRs	%
1	Research and Development (R&D)	47	39.83
2	Universities	33	27.96
3	Institute of Technology and Management	22	18.64
4	Information Resource Centres	9	7.62
5	Government Organizations	5	4.23
6	Public Libraries	1	0.84
7	Private Companies	1	0.84
	Total No. of IRs	**118**	**100**

The table 1 and chart 1 depicts that, R & D institutions is having more number of IRs i.e. 47 (39.83%), followed by Universities 33 (27.96%), and Institute of Technological and Management Institutions 22(18.64%) are providing open access services to the user through using the open source software's.

Table 2 – State wise Distribution

Sl. No.	Name of the state	No. IRs	%
1	Karnataka	27	22.88
2	Haryana	25	21.18
3	Kerala	12	10.16
4	Maharashtra	12	10.16
5	Tamil Nadu	08	6.77
6	West Bengal	07	5.93
7	Gujarat	06	5.08
8	Utter Pradesh	04	3.38
9	Goa	03	2.54
10	Orissa	03	2.54
11	Andhra Pradesh	03	2.54
12	Jharkhand	01	0.84
13	Jammu and Kashmir	01	0.84
14	Pondicherry	01	0.84
15	Meghalaya	01	0.84
16	Uttarakhand	01	0.84
17	Other	03	2.54
	Total	**118**	**100**

The table 2nd indicates that state wise implementation of Institutional Repositories in India, in Karnataka 27 (222.88%) institutions was implementation of Institution Repositories, Haryana (New Delhi-Union territory) 25 (21.18%), Kerala 12 (10.16%), and Maharashtra 12 (10.16%) get into 4th highest institutes was implementation of Institutional Repositories.

Table 3 - Regional wise Distribution

Sl. No.	Name of Region	No. of IR's	%
1	South India	68	57.82
2	North India	47	39.83
3	Other	03	02.54
	Total Number of IR's	**118**	**100%**

In table 3 shows Regional Wise implementation of IR's in India, here we categorized two regional parts as South and North India, South India 68 (57.62%) has most number of IR's compare to North India (39.83%).

Table 4 - Software wise Distribution

Sl. No.	Name of the Software	No. IR's	%
1	Dspace	75	63.56
2	Eprints	31	26.28
3	Greenstone	1	0.84
4	Others	11	09.32
	Total No. of IR's	**118**	**100%**

The above table shows that, among 118 IR's Dspace 75 (63.56%) is the most commonly used open source institutional repository software in India, followed by Eprints software 31 (26.28%).

Table 5 - Distribution of type of Repositories

Sl. No.	Type of Repositories	No. of IR's	%
1	Research and Development	67	56.77
2	Research and Development with e-Thesis	19	16.10
3	E-Journals	20	16.94
4	Learning and Teaching Objects	08	06.77
5	Research cross institutions	03	02.54
6	Business and Communication	01	00.84
	Total Number of IR's	**118**	**100%**

The Table no. 5 indicates that, Research and Development institution is having highest number of IR'si.e 67 (56.77%), followed by Research and Development with e-Thesis and Dissertations having 19 (16.10%) and E-Journals repositories 20(16.94%).

Table 6 - Establishment year wise distribution

Sl. No.	Year of Establishment	No. of IR's	%
1	2004	7	05.93
2	2005	7	05.93
3	2006	12	10.16
4	2007	10	08.47
5	2008	19	16.10
6	2009	21	17.79
7	2010	26	22.03
8	2011	16	13.55
	Total Number of IR's	**118**	**100%**

The above table shows that year wise establishment of IR's of various organizations in India. In the year 2010, 26 (22.03%) highest no of organization have established their IR's in India. In the year 2009 21 (17.79%), 2008 19 (16.10%), and in the year 2011 16(13.55%) have tremendous growth in the establishment of IR's in various organization of India.

9. Present Indian Institutional Repositories

In India, the tradition of Science & Technology is over 5,000 years old. India is the third highest higher education system in the world with 431 universities, 20,677 colleges, 7,000 technical and 1,500 research institutions. The council of Scientific and Industrial Research run 37 public funded research laboratories, 109 Research and Development institutions at present engaging in different disciplines.

- **Repositories of Research and Development institutions in India:** Research and Development (R & D) institutions and higher learning institutions in India are engaged in advanced studies, leading to development of new applications, new techniques, new products and new technologies. The R&D organizations have also developed expertise in their respective areas that are now recognized worldwide.

The Table 7 (A) clearly states that, 46 IR's are established by R & D institutions out of 109 institutions of R&D institutions in India. The below list is a directory of institutional repositories of India.

Table 7 (A) R & D Institutions

Sl. No.	Name of the Institute	URL of IR	State	Software
1	Indian Institute of Science	http://eprints.iisc.ernet.in	Karnataka	Eprints
2	Indian Institute of Science	http://etd.ncsi.iisc.ernet.in/dspace	Karnataka	Dspace
3	Central Marine Fisheries Research Institute	http://eprints.cmfri.org.in	Kerala	Eprints V.3.1.3
4	Raman Research Institute	http://dspace.rri.res.in	Karnataka	Dspace
5	National Institute of Oceanography	http://drs.nio.org	Goa	Dspace
6	National Aerospace Laboratories	http://nal-ir.nal.res.in	Karnataka	Eprints V2.3.6
7	Indian Institute of Astrophysics	http://prints.iiap.res.in	Karnataka	Dspace
8	National Metallurgical Laboratory	http://eprints.nmlindia.org	Jharkhand	Eprints V2.3.6
9	National Centre for Catalysis Research	http://203.199.213.48/	Tamil Nadu	Eprints V3.0.1
10	Council of Scientific and Industrial Research	http://eprints.csirexplorations.com	Maharashtra	Eprints V3.1.0
11	National Centre for Antarctic & Ocean Research	http://www.ncaor.nic.in	Goa	Dspace
12	Madras Diabetes Research Foundation	http://mdrf-erpints.in	Tamil Nadu	Dspace
13	National Chemical Laboratory	http://dspace.ncl.res.in	Maharashtra	Dspace
14	Central Research Drug Institute	http://dkr.cdri.res.in:8080/dspace	West Bengal	Dspace
15	Indian Statistical Institute	http://drtc.isibang.ac.in	Karnataka	Dspace
16	Indian Agricultural Research Institute	http://eprints.iari.res.in	Haryana	Eprints V3.1.3
17	Institute of Minerals and Materials Technology	http://eprints.immt.res.in	Orissa	Eprints V3.1.3
18	The Institute of Integrative Omics and Applied Biotechnology	http://www.iioabjournal.webs.com	West Bengal	Others
19	Indian Institute of Horticultural Research	http://www.erepo.iihr.ernet.in	Karnataka	Dspace
20	Central Institute of Medicinal and Aromatic Plants	http://203.190.147.121/index.jsp	Utter Pradesh	Dspace
21	International Crops Research Institute for the Semi-Arid Tropics	http://www.agropedia.net/openaccess	Utter Pradesh	Dspace
22	Indira Gandhi Institute of Development Research	http://oii.igidr.ac.in:8080/dspace/index.jsp	Maharashtra	Dspace
23	Ashoka Trust for Research in Ecology and the Environment	http://eprints.atree.org	Karnataka	Eprints V3.2.5
24	Bethesda CAM Research Centre	http://www.freewebs.com/siddhapapers	Tamil Nadu	Other
25	Rajiv Gandhi Centre for Biotechnology	http://www.rgcb.res.in	Kerala	Other
26	Central Salt & Marine Chemicals Research Institute	http://www.csmcri.org/pages/Resources/KRC_Library.php	Gujarat	Dspace
27	National Institute of Immunology	http://eprints.nii.res.in.cgi/oai2	Haryana	Eprints
28	The Institute of Mathematical Sciences	http://www.imsc.res.in/eprints	Tamil Nadu	Eprints
29	National Centre for Radio Astrophysics	http://ncralibl.bcra.yifr.res.in:8080/jspui	Maharashtra	Dspace
30	Ministry of Earth Sciences	http://moeseprints.incois.gov.in	Haryana	Eprints
31	Indian Academy of Sciences	http://eprints.informindia.co.in	Karnataka	Eprints
32	Indian Institute of Spices Research	http://220.227.138.214:8080/dspace	Kerala	Dspace

33	Medical and Allied Sciences	http://openmed.nic.in	Haryana	Eprints V3.1.2
34	Institute of Social and Economic Change	http://203.200.22.249:8080/jspui	Karnataka	Dspace
35	Centre for Study of Developing Societies	http://archive.sarai.net/dspace	Haryana	Dspace
36	International Competence Centre for Organic Agriculture	http://www.iccoa.org/home.php	Karnataka	Eprints
37	National Institute of Oceanography	http://drs.nio.org	Goa	Dspace
38	Council of Scientific and Industrial Research (NSDL)	http://nsdl.niscair.res.in	Haryana	Dspace
39	NISCAIR Online Periodicals Repository (NOPR)	http://nopr.niscair.res.in	Haryana	Dspace
40	National Institute of Advanced Studies	http://59.90.235.217:8081/	Karnataka	Eprints
41	Army Institute of Fashion and Design	http://www.aifdonline.in/facilities.htm# - Under Progress	Karnataka	Eprints
42	Electroporcelains Division, Bharat Heavy Electricals Ltd.	http://www.bhelceramics.com/ -Under Progress	Karnataka	Dspace
43	DESIDOC Journal of Library & Information Technology	http://publications.drdo.gov.in	Haryana	Other
44	One World South Asia Open Archive Initiative	http://ekduniya.net	Haryana	Epritns
45	National Physical Laboratory	http://nsl.niscair.res.in/IRepository.jsp	Haryana	Dspace
46	Aryabhatta Research Institute Observational Sciences	http://192.168.1.171.:8080/jspui	Utterkhand	Dspace
47	Physical Research Laboratory	http://www.prl.res.in/~Library	Gujarat	Greenstone

- **IR's of Indian Universities:** Universities are back bone of the higher education system, current universities were developed in a bygone era to satisfy the needs of that time. The today's main issue is to open up the elite university to the masses of young people and to adjust to today's democratic, pluralistic society, and at the same maintain the standard of teaching and research.

The 7(B) indicates that, out of 431 universities only 33universities are established their institutional repositories in India. Indian universities are facing some problems in implementing the IRs due to lack of knowledge about the IR implementation, lack of human resources, financial issues, and the researchers or faculties of the universities are not ready to submit their research output in their IRs because of copyright issues and willingness to submit.

Table 7 (B)

Sl. No.	Name of the Institute	URL of IR	State	Software
1	Cochin University of Science & Technology	http://dyuthi.cusat.ac.in/dspace	Kerala	Dspace
2	University of Delhi	http://library.du.ac.in/dspace	Haryana	Dspace
3	School of Biotechnology, Madurai Kamaraj University	http://eprints.bicmku.in	Tamil Nadu	Dspace
4	Madurai Kamaraj University	http://eprints.mkuoa.in	Tamil Nadu	Eprins V3.1.3
5	University of Kashmir	http://dspace.uok.edu.in:8080/dspace	Jammu & Kashmir	Dspace
6	Mahatma Gandhi University	http://mgutheses.org	Kerala	Other
7	University of Hyderabad	http://www.new.dli.ernet.in	Andhra Pradesh	Dspace

8	Guru Gobind Singh Indraprastha University	http://dspace.ipu.ernet.in:808/dspace	Haryana	Dspace
9	Aligarh Muslim University	http://www.bioinformation.net	Utter Pradesh	Other
10	University of Mysore	http://vidyanidhi.org.in	Karnataka	Dspace
11	PanditDeendayal Petroleum University	http://203.77.192.116	Gujarat	Dspace V 1.4.1
12	Thapar University	http://dspace.thapar.edu:8080.dspace	Maharashtra	Dspace
13	Indira Gandhi National Open University (eGyankosh)	http://www.egyankosh.ac.in	Haryana	Dspace
14	Rajiv Gandhi University of Health Sciences	http://119.82.96.198:8080/jspui	Karnataka	Dspace
15	Pondicherry University	http://210.212.230.223	Pondicherry	Dspace
16	North-Eastern Hill University	http://dspace.nehu.ac.in/jspui	Meghalaya	Dspace
17	Delhi Technological University	http://www.dspace.dce.edu	Haryana	Dspace
18	Banasthali University	http://www.banasthali.org/banasthaliwcms/en/home/library/campusilib/About_library.html	Rajasthan	Dspace
19	Kerala Agricultural University	http://www.jtropag.in	Kerala	Other
20	Bangalore University	http://202.141.128.119	Karnataka	Dspace
21	ICRISAT, University of agricultural Sciences (GKVK)	http://eprints.icrisat.ac.in/8154/	Karnataka	Eprints
22	Kuvempu University	http://www.kuvempu.ac.in/libraryweb/lib-eres.htm	Karnataka	Eprints
23	SRM Institute of Science and Technology	http://www.srmuniv.ac.in/about_us.php?page=library	Tamil Nadu	Dspace
24	Sri Venkateshwara University	http://203.77.192.116:8080/dspace	Andhra Pradesh	Dspace
25	Amrita University	http://dspace.amrita.ac.in:8080/jspui	Tamil Nadu	Dspace
26	Bharathidasan University	http://libary.bdu.ac.in	Tamil Nadu	Dspace
27	Christ University	http://repository.christuniversity.in/	Karnataka	Eprints
28	Goa University	http://goalnet.unigoa.ac.in.gulibrary/digital.htm	Goa	Dspace
29	Jadavpur University	http://203.197.118.96:8080/juportal	West Bengal	Dspace
30	NALSAR University of Law	http://www.nalsar.ac.in/eLibrary/e-resources.html	Andhra Pradesh	Dspace
31	University of Mumbai	http://mum.digitaluniversity.ac Under Progress	Maharashtra	Dspace
32	University of Pune	http://lib.unipune.ac.in Under Progress	Maharashtra	Dspace
33	Vidyasagar University	http://192.168.100.2:8080.dspace	West Bengal	Dspace

- **Institutes of Management and Technology**

Table 7 (C)

Sl. No.	Name of the Institute	URL of IR	State	Software
1	Indian Institute of Technology	http://eprint.iitd.ac.in.dspace	Haryana	Dspace
2	National Institute of Technology	http://dspace.nitrkl.ac.in/dspace	Orissa	Dspace
3	Indian Institute of Technology	http://dspace.library.iitb.ac.in/jspui	Maharashtra	Dspace
4	S.V. National Institute of Technology	http://eprints.svnit.ac.in	Maharashtra	Eprints
5	National Institute of Technology	http://library.iitk.ac.in/index1.html	Utter Pradesh	Other
6	Sri Dharmasthala Manjunatheshwara Institute of Technology	http://www.sdmcet.ac.in/lib11.php	Karnataka	Dspace
7	National Institute of Technology	http://ethesis.nitrkl.ac.in	Orissa	Eprints V3.1.2
8	SCMS Group of Institutions	http://dspace.scmsgroup.org	Kerala	Dspace
9	SreeNarayanaGurukulam College of Engineering	http://dspace.sngce.ac.in/	Kerala	Dspace
10	Vidya Academy of Science & Technology	http://vidyaacademy.ac.in/?q=content/library	Kerala	Dspace
11	Indian Institute of Technology	http://www.agropedia.net/openaccess	West Bengal	Other
12	B.V. Bhiimaraddi College of Engineering and Technology	Under Progress	Karnataka	Dspace
13	Jaypee Institute of Information Technology	http://www.jiit.ac.in.infra/library.php	Utter Pradesh	Dspace
14	Bangalore Management Academy	http://bma.ac.in:8080/dspace	Karnataka	Dspace
15	Indian Institute of Management	http://dspace.iimk.ac.in	Karnataka	Dspace
16	Management Development Institute	http://dspace.mdi.ac.in/dspace	Haryana	Dspace
17	ICFAI Business School	http://202.131.96.59:8080/dspace	Gujarat	Dspace
18	Institute of Finance and International Management	http://ifimbschool.com/campus_infrastructure.html	Karnataka	Eprints
19	Indian Institute of Management	http://www.iimb.ernet.in/library	Karnataka	Eprints
20	Bharata Mata Institute of Management	http://bmim.org/library.htm	Kerala	Dspace
21	Dr. V N Bedkar Management	http://dspace.vpmthane.org:8080/jspui/index.jsp	Maharashtra	Dspace

- **Government Organizations**

Right now in India central government organizations are 567, State Government Organizations are 637, Government Departments are 480, International Organizations are 21, Judiciary are 75, Railway's are 48, Trade Promotion Organizations are 94, working for fields and providing online information related to various government organizations providing services in the field of education, infrastructure development, Science and Technology, Agriculture, and Scientific Research etc. But only 5 organizations are having institutional repositories to facilitate open access to information.

Table 7 (D)

Sl. No.	Name of the Institute	URL of IR	State	Software
1	Rajya Sabha – Official Debates of Indian Parliament	http://rsdebate.nic.in	Haryana	Dspace
2	World Health Organization, Country Office of India	http://whoindia.healthrepository.org	Haryana	Dspace
3	High Court of Karnataka	http://164.100.80.145:8080/dspace	Karnataka	Dspace
4	NGO Gateway	http://www.ngogateway.org	Haryana	Dspace
5	Ministry of Rural Development, Government of India	http://knowledge.nrega.net	Haryana	Eprints V3.1.2

- **Information Resource Centres**

Table 7 (E)

Sl. No.	Name of the Institute	URL of IR	State	Software
1	Information and Library Network Centre	http://ir.inflibnet.ac.in	Gujarat	Dspace
2	Information and Library Network Centre (e-thesis)	http://shodhganga.inflibnet.ac.in	Gujarat	Dspace
3	International Journal of Contemporary Dentistry	http://edentj.com/index.php/ijcd/index		Dspace
4	International Open Archives for LIS	http://eprints.rclis.org		Eprints
5	Indian Medlar Centre	http://medind.nic.in/medindcf/medinda.shtml	Haryana	Other
6	Indian National Science Academy	http://www.insa.ac.in	Haryana	Other
7	Medknow Publications (Online)	http://www.medknow.com/journals.asp	Maha rashtra	Other
8	Indian Journals (Online)	http://www.indianjournals.com/ijor.aspx	Haryana	Other

Table 7 (E) shows that, list of repositories of special information centres which can provide the information to the specific category of people who needs it.

- **Privet Companies**

Table 7 (F)

Sl. No.	Name of the Institute	URL of IR	State	Software
1	The SMART Tech	http://samrtech.gatech.edu	Karnataka	Dspace

Table 7 (F) states that, only one private company having open access to their information but other private companies may have their repositories but they are not made available for public because of security reasons and they are use it in intranet for their employees.

- **Public Libraries**

Table 7 (G)

Sl. No.	Name of the Institute	URL of IR	State	Software
1	West Bengal State Central Library	http://dspace.wbpublibnet.gov.in/dspace	West Bengal	Dspace

Table 7 (G) shows that, only one public library having their institutional repository out of 28 State Public Libraries, 451Dsitrict Public Libraries. The public libraries beyond in implementing IR's because lack of awareness among the library staff, financial problems, lack of human resources and the interest of library staff to implement the IR's in their libraries.

10. Challenges for Implementation of Institutional Repositories

- A further challenge is the issue of copyright materials and the fact that authors who publish in journals usually sign copyright transfer forms that transfer copyright form the author to the publisher.
- Technical issues also come into play as achallenge and include matters such as the format of items to be deposited, as well as the fact that software versions change and may not allow backward use.
- Another challenge in building IR's is identified in the literature as ensuring that the IR has current that grows.
- A lot of the challenges in increasing participation of academics and researchers in depositing content are succinctly articulated by Fitzgerald & Austin (2008).
- Donovan & Watson (2008) also point out that for repositories that accept all output, published or not, one challenge may be posed by authors who want to deposit everything and anything.

11. Findings

- Most of the IR's India is developed by R & D institutes 47 (38.98%), followed by Universities 33 (27.96%) and Management & Technology institutes 22 (18.64%)
- Among the 28 States, Karnataka state 27 (22.88%) and Haryana 25 (21.18%) states having more awareness in using IR's.
- Study states that, South Indian 68 (57.62%) region having more awareness about IR's than North India 47 (39.83%) region.
- It is observed that Dspace 75 (63.56%) and Eprints 31 (26.28%) are most commonly used open source software's for Institutional Repositories.
- Maximum numbers of institutions are using IR's for to promote Research and to collect and preserve the research publications 67 (56.77%), e-Thesis and Dissertations 19 (16.10%), E-Journals 20 (16.94%).
- Universities of India have to take initiative to implement the IR's to Research community, faculties and to the students. Only few universities (33) are having their repositories in India.
- The numbers of Government Organizations and Public Libraries have to take initiative to implement IR's and to disseminate the publically needed information to the common man.

12. Conclusion

Institutional Repositories offer the opportunity for libraries to collect, preserve, and disseminate the institutions scholarly output. Serving an important service to the community, institutional repositories offer many benefits to the institutions community and other communities of the world. Institutional Repositories make it possible to collect content in one location, capture and provide open access to the intellectual output of a institutions, as well as preserve content that may be otherwise unavailable or out of publication. It is

essential to explore the benefits as well as the challenges of institutional repositories to make sure it is worthwhile to the library as well as the institutions.

In India, there are a number of open access initiatives in many forms, such as open access journals, archives of back volumes of journals, institutional repositories, subject specific repositories, document specific repositories, open courseware, etc., in India, some other related initiatives also available cultural heritage literature to the world. All these things are available in open access mode only, where costs of accessing scholarly materials reduced drastically. Providing global access to local research is another challenge of open access initiatives in India. Some studies and usage statistics of some repositories show that the researchers of developed nations are accessing the Indian literature available in the open access journals and archives. India is not only leading open access movement of the developing countries, but also making developed countries aware of qualitative scholarly originated from developing countries.

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Data Mining Applications in Library and Information Science

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Data Mining refers to the extraction or "Mining" knowledge from large amount of data or Data Warehouse. To do this extraction data mining combines artificial intelligence, statistical analysis and database management systems to attempt to pull knowledge form stored data. This paper gives an overview of this new emerging technology which provides a road map to the next generation of library. And at the end it is explored that how data mining can be effectively and efficiently used in the field of library and information science and its direct and indirect impact on library administration and services.



Data Mining, Data Warehouse, OLAP, KDD, e-Library

1. Introduction

An area of research that has seen a recent surge in commercial development is data mining, or knowledge discovery in databases (KDD). Knowledge discovery has been defined as "the non-trivial extraction of implicit, previously unknown, and potentially useful information from data". To do this extraction data mining combines many different technologies. In addition to artificial intelligence, statistics, and database management system, technologies include data warehousing and on-line analytical processing (OLAP), human computer interaction and data visualization; machine learning (especially inductive learning techniques), knowledge representation, pattern recognition, and intelligent agents. One may distinguish between data and knowledge by defining data as corresponding to real world observations, being dynamic and quite detailed, whereas knowledge is less precise, is more static and deals with generalizations or abstraction of the data. A number of terms have been used in place of data mining, including information harvesting, data archaeology, knowledge mining, and knowledge extraction. The knowledge is stored in data warehouse, which is the central store house of data that has been extracted from operational data over a time in a separate database. The information in a data warehouse is subject oriented, non-volatile and historic in nature, so they contain extremely large datasets.

Libraries also have the big collection of information and in e-Library there are organize collection of information which serves a rich resource for its user communities. E-Library includes all the processes and services offered by traditional libraries though these processes will have to be revised to accommodate difference between digital and paper media. Today's e-Libraries are built around Internet and Web technologies with electronic books and journals as their basic building blocks. Here Internet serves as a carrier and provides the contents delivery mechanism and Web technology provides the tools and techniques for content publishing, hosting and accessing. The availability of computing power that allow parallel processing, multitasking and parallel knowledge navigation with increasing popularity of Internet and development in Web technologies are the main catalyst to the concept of e-Library.

2. The Knowledge Discovery Database (KDD) Process

The data mining is actually a step in a larger KDD process. The KDD process employs data mining methods or algorithms to extract or identify knowledge according to some criteria or measure of interestingness, but it also includes steps that prepare the data, such as preprocessing, sub-sampling, and transformations of the database [6].

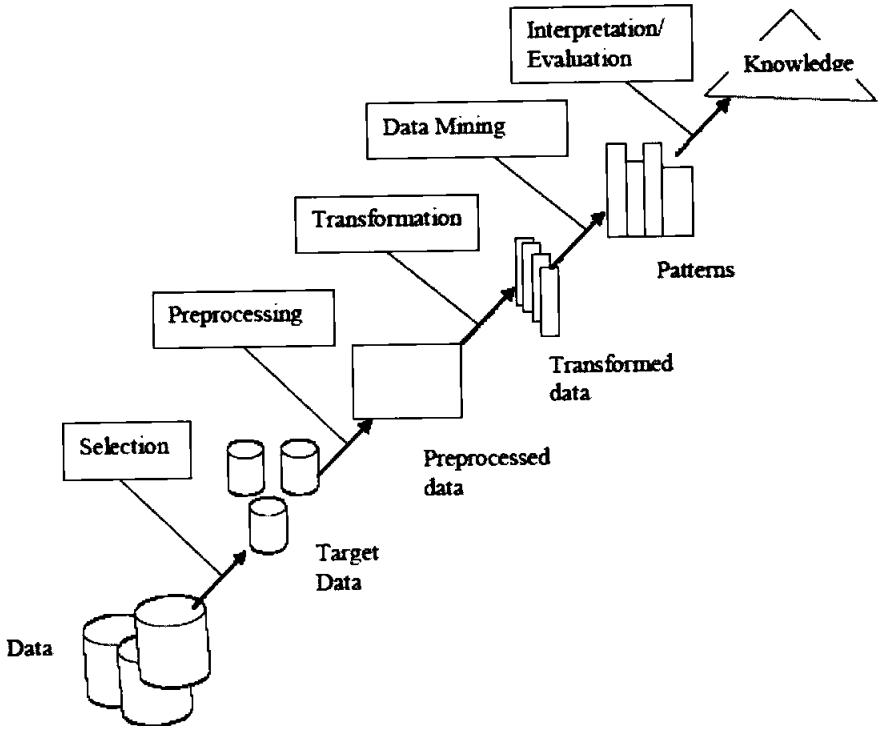


Figure1. The KDD Process

The first step in the KDD process is to select data to be analyzed from the set of all available data. In many cases, the data is stored in transaction databases. These databases are quite large and extremely dynamic. Therefore a subset of the data must be selected from those databases, since it is unnecessary in the early stages to attempt to analyze all data. Target data is then moved to a cache or another database for further preprocessing. Preprocessing is extremely important step in KDD process. Often, data have errors introduced during the input process, either from a data entry clerk entering data incorrectly or from a faulty data collection device. If target data are being extracted from several source databases, the databases can often be inconsistent with each other in terms of their data models, the semantics of the attributes, or in the way the data is represented in the database. If the two databases were built at different times and following different guidelines, it is entirely possible that they may be two different data models (relational and object-oriented) and two different representations of the entities or objects and their relationships to each other. The preprocessing step should identify these differences and make the data consistent and clean.

The data can often be transformed for use with different analysis techniques. A number of separate tables can joined into one table, and vice versa. An attribute that may be represented in two different forms (date written as 3/15/97 versus 15-3-1997) should be transformed into common format. If the data is represented as text, but it is intended to use a data mining technique that requires the data to be in numerical form, the data must be transformed accordingly. At this point, data mining algorithms can be used to discover knowledge, e.g., trends, patterns, characteristics, or anomalies. The appropriate discovery or data mining algorithms should be identified, as they should be pertinent to the purpose of the analysis and to the type of data to be analyzed. Often, the data mining algorithms work more effectively if they have some amount of domain information available containing information on attributes that have higher priority than others, attributes that are not important at all, or established relationships that are already known. Domain information is often collected in knowledge base, a storage mechanism similar to a database but used to store domain information and other knowledge.

3. The Virtuous Cycle of Data Mining

The promise of data mining is to find the interesting patterns in the large amount of database. But merely finding the patterns is not enough. You must be able to respond to the patterns, to act on them, ultimately turning the data into information, the information into action, and the action into the value. This is the virtuous cycle of data mining in a nutshell. There are four stages of the virtuous cycle of data mining.

- Identify the business problem
- Use data mining technique to transform the data into actionable information
- Act on the information
- Measures the result

These steps are highly interdependent; the results of one stage are the inputs into the next phase, much like the steps in multi-step manufacturing process. The whole approach is driven by results. Each stage depends on the results from the previous stage.

4. Use of Data Mining

Data mining derives its name from the similarities between searching for valuable information in a large database. Granter group advanced technology research note listed data mining and artificial intelligence at the top of the five key technology areas that "will clearly have a major impact across a wide range of industries within the next three to five years." Granter also listed parallel architectures and data mining as two of the top ten new technologies in which companies will invest during the next five years [3].

In fact practical data mining can accomplish a limited set of tasks and only limited circumstances. The main important thing is that it can be used in many problems of intellectual, economic, and business interest. These problems can be phrased in terms of the following six tasks.

- **Classification-** classification consists of examining the features of newly presented object and assigning it to one of the predefined set of classes.
- **Estimation-** classification deals with discrete outcomes while estimation deals with continuously valued outcomes. Given some input data, we use estimation to come up with a value for some unknown continuous variable such as income, height, or credit card balance.
- **Prediction-** prediction is the same as classification or estimation except that the records are classified according to some predicted future behavior or estimated future value. In prediction task, the only way to check the accuracy of the classification is to wait and see.
- **Affinity Grouping-** the task of affinity grouping is to determine which things go together. Affinity grouping can also be used to identify cross-selling opportunities and design attractive packages or grouping of product and services. Affinity grouping is one simple approach to generating rules from data. If two items, say cat food and kitty litter, occur together frequently enough, we can generate two association rules:
    - People who by cat food also by kitty litter with probability P1.
    - People who by kitty litter also by cat food with probability P2.
- **Clustering-** clustering is the task of segmenting a heterogeneous population into a number of more homogeneous subgroups or clusters. Clustering differs from classification in the way that clustering does not rely on predefine classes. In clustering, there are no predefined classes and no examples.
- The records are group together on the basis of self-similarity.
- **Description-** some time the purpose of data mining is simply to describe what is going on in complicated database in a way that increases our understanding of the people, products, or processes

that produced the data in the first place. A good enough description of a behavior will often suggest an explanation for it as well. No single data mining tool and technique is equally applicable to all the tasks. In commercial application, data mining is usually employed on very large databases. The reasons for this are twofold.

- In small databases, it is possible to find interesting patterns and relationships by simple inspection of results from familiar tool such as spreadsheets and multidimensional query tools.
- Most data mining technique require large amount of training data containing many examples in order to generate classification rules, association rules, clusters, or predictions. Small datasets lead to unreliable conclusion based on chance patters.

5. The Algorithm: The Apriori algorithm

One of the most popular data mining approaches is to find frequent itemsets from a transaction dataset and derive association rules. Finding frequent itemsets (itemsets with frequency larger than or equal to a user specified minimum support) is not trivial because of its combinatorial explosion. Once frequent itemsets are obtained, it is straightforward to generate association rules with confidence larger than or equal to a user specified minimum confidence. Apriori is a seminal algorithm for finding frequent itemsets using candidate generation. It is characterized as a level-wise complete search algorithm using anti-monotonicity of itemsets, "if an itemset is not frequent, any of its superset is never frequent". By convention, Apriori assumes that items within a transaction or item set are sorted in lexicographic order.

Let the set of frequent item sets of size k be Fk and their candidates be Ck . Apriori first scans the database and searches for frequent item sets of size 1 by accumulating the count for each item and collecting those that satisfy the minimum support requirement. It then iterates on the following three steps and extracts all the frequent item sets. Generate Ck+1, candidates of frequent itemsets of size k +1, from the frequent item sets of size k. Scan the database and calculate the support of each candidate of frequent item sets. Add those itemsets that satisfies the minimum support requirement to Fk+1. The Apriori algorithm is shown in Fig. 3. Function apriori-gen in line 3 generates Ck+1 from Fk in the following two step process:

- Join step: Generate RK+1, the initial candidates of frequent itemsets of size k + 1 by taking the union of the two frequent itemsets of size k, Pk and Qk that have the first k−1 elements in common.

$$RK+1 = Pk \cup Qk = \{i\,teml \ldots i\,temk-1, i\,temk, i\,temk_\}$$
$$Pk = \{i\,teml, i\,tem2, \ldots, i\,temk-1, i\,temk\}$$
$$Qk = \{i\,teml, i\,tem2, \ldots, i\,temk-1, i\,temk_\}$$
$$\text{where, } i\,teml < i\,tem2 < \cdots < i\,temk < i\,temk_.$$

- Prune step: Check if all the itemsets of size k in Rk+1 are frequent and generate Ck+1 by removing those that do not pass this requirement from Rk+1. This is because any subset of size k of Ck+1 that is not frequent cannot be a subset of a frequent itemset of size k + 1. Function subset in line 5 finds all the candidates of the frequent itemsets included in transaction t. Apriori, then, calculates frequency only for those candidates generated this way by scanning the database.

It is evident that Apriori scans the database at most kmax+1 times when the maximum size of frequent itemsets is set at kmax. The Apriori achieves good performance by reducing the size of candidate sets (Fig. 3). However, in situations with very many frequent itemsets, large itemsets, or very low minimum support, it still suffers from the cost of generating a huge number of candidate sets

Algorithm 1 *Apriori*

F_l=(Frequent itemsets of cardinality 1);

for($k = 1; F_k \neq \phi; k++$) do begin

C_{k+1} = apriori-gen(F_k); //New candidates

for all transactions $t \in$ Database do begin

C'_t = subset(C_{k+1}, t); //Candidates contained in t

for all candidate $c \in C'_t$ do

$c.count++;$

end

$F_{k+1} = \{C \in C_{k+1} \quad | c.count \geq$ minimum support $\}$

end

end

Answer $\cup_k F_k$;

and scanning the database repeatedly to check a large set of candidate itemsets. In fact, it is necessary to generate 2100 candidate itemsets to obtain frequent itemsets of size 100.

6. The impact of the algorithm

Many of the pattern finding algorithms such as decision tree, classification rules and clustering techniques that are frequently used in data mining have been developed in machine learning research community. Frequent pattern and association rule mining is one of the few exceptions to this tradition. The introduction of this technique boosted data mining research and its impact is tremendous. The algorithm is quite simple and easy to implement.

7. Knowledge Discovery

Knowledge discovery can be either directed or undirected. Directed Knowledge Discovery is goal oriented. There is a specific field whose value we want to predict, a fix set of classes to be assigned each record, or a specific relationship we want to explore. The directed knowledge discovery method has several steps:

- Identify sources of pre-classified data
- Prepare data for analysis
- Build and train the computer model
- Evaluate the computer model
- Apply the Computer model to the new data.

In Undirected Knowledge Discovery the data mining tool is simply let loose on the data in the hope that it will discover meaningful structure. One common use of undirected knowledge discovery is market

basket analysis. Another application is clustering, where groups of records are assigned to the same cluster if they have something in common. The undirected knowledge discovery method has several steps:

- Identify source of data
- Prepare data for analysis
- Build and train a computer model
- Evaluate the computer model
- Apply the computer model to the new data
- Identify potential targets for directed knowledge discovery
- Generate new hypothesis to test.

You will notice that steps I through V are the same as for directed knowledge discovery. The two additional steps reflect the fact that undirected knowledge discovery is usually a prelude to further investigation via more directed technique.

8. Data Mining and the Libraries

Till now we have discusses about the data mining and it's working. Now we are going to explore how data mining can be useful in the field of library and information science. As per fifth law of library science "Library is a growing organization" [9] so the volume of the library data is also growing with an enormous rate. For efficiently and effectively doing the library administration and extending library services the need of library automation and e-Library occur. But simply automating the library or developing an e-Library is not the only solution unless and until we are not able to explore the hidden information from the large amount of database. This can be done by applying the data mining in the library data.

Now we take a glance on the possibilities opening in the new age of data mining in the field of library and information science.

9. Future of data mining in the library working

In future Data Mining can provide the new road map for the next generation of library by applying it for the following activities of library.

- Searching of Information (Reference Service)- Since the data of the library continuously growing with an exponential rate and the main problem is how one can reference the required information from the large amount of redundant information of the library. This can be possible by applying data mining techniques, so one can say that the data mining is the future of reference service.
- Classification- It will replace the manual classification of content of the library with the computer assisted classification, so that the classification task can be accomplished by less skilled person in a fast and efficient way. This will simplify the classification task of the library.
- Acquisition- As per third law of library science "Every book its reader" [9]. By applying the data mining in the library data it can be easily find out the required contents that are necessary to acquire next. This will reduce the work of library staff related to the acquisition as well as the efficient use of budget allocated to the library.

10. Conclusion

It can be concluded that there is the need of data mining techniques that will redesign and simplify the working of library like classification, acquisition, circulation and referencing. The main use of data mining is in referencing but it can be used for some other work of library as well. So it is urgently needed that systematic efforts have been take place to develop data mining techniques and algorithms for library database.

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Ethical Issues Concerned with the Knowledge Management in Libraries

Anil Kumar Dhiman **Sushil Kumar Sharma**



Libraries being the mirror of society contain contemporary collection along with other documents. However, the emerging ICT technology has changed the shape of libraries where they are converting themselves into electronic and multimedia libraries. Consequently, today librarians require changing their role from traditional librarians to information managers and information scientists by learning and applying new skills to understand the evolving technologies to manage and provide quality on-line information service to the knowledge society. Therefore, the libraries are opting knowledge management techniques to manage their collection and services. But knowledge management has raised new and often confusing ethical problems in front of them. This has become much true because of the challenges posed by the Internet and electronic resources to the protection of privacy and intellectual property. This paper discusses the concept of knowledge management and ethical issues possibly to be faced by the librarians in modern era.



Digital libraries, Ethical issues, ICTs, Knowledge management.

1. Introduction

Knowledge is defined as the familiarity with someone or something, which can include facts, information, descriptions, or skills acquired through experience or education. It can be divided into two types – tacit knowledge and the explicit knowledge (Polanyi, 1973). He says, tacit knowledge consists of hands-on skills, best practices, special know-how, heuristic, intuitions, and so on. Tacit knowledge is personal knowledge that is hard to formalize or articulate. Its transfer takes place by traditions and shared experiences; for example, through apprenticeship or job training. Tacit knowledge in an organization ensures task effectiveness-that the right things are being done so that the work unit could attain its objectives. It also provides for a kind of creative robustness - intuition and heuristic which can often tackle tough problems that would otherwise be difficult to solve. Whereas explicit knowledge is rule-based knowledge that is used to match actions to situations by invoking appropriate rules. Explicit knowledge is used in the design of routines, standard operation procedures, and the structure of data records. Explicit knowledge enables the organization to enjoy a certain level of operational efficiency and control. It also promotes equable, consistent organizational responses. Tacit as well as the explicit knowledge – both forms of knowledge are found in each and every organization.

2. Ethics in Knowledge Management

All the times, knowledge management is seen with positive connotation, like it will preserve expertise, it will enable greater efficiency among the workers and achievements and also it will generate valuable resources and support knowledge workers. But Land et. al. (2004) warns that there is necessarily a threat to this promise. They warn that inspite of positive connotations; knowledge management can be both a benign and malign thing. Copyrights, intellectual property, and privacy laws that are concerned with an individual's condition of life characterized by exclusion from publicity, are most important elements which come in the way of knowledge management mostly and they restrict the use of knowledge commodities to be processed and shared to advance the needs of the organizations. These constitute ethical issues which are most important to take care while going for implementing knowledge management strategy in any organization including library and information centres.

Ethics is a subject of study that is concerned with moral principle or framework (Hawker, 2002). These are related to the moral principles that govern a person's behaviour or the conducting of an activity. Its purpose according to Spinello (1995) is to help us behave honourably and attain those basic goods that make us more fully human.

Ethics issues pervade all environments where information or any other form of content is generated, stored, communicated, applied and owned. Mason (1986) observed that people's intellectual capital is impaired whenever they lose their personal information without being compensated for it, when they are precluded access to information which is of value to them, when they have revealed information they hold intimate, or when they find out that the information upon which their living depends is in error.

Mason (1986) has listed some of the major ethical threats which are to be posed by technology. They are:

- **Privacy:** What information about one's self or one's associations must a person reveal to others, under what conditions and with what safeguards? What things can people keep to themselves and not be forced to reveal to others?
- **Accuracy:** Who is responsible for the authenticity, fidelity and accuracy of information? Similarly, who is to be held accountable for errors in information and how is the injured party to be made whole?
- **Property:** Who owns information? What are the just and fair prices for its exchange? Who owns the channels, especially the airways, through which information is transmitted? How should access to this scarce resource be allocated?
- **Accessibility:** What information does a person or an organization have a right or a privilege to obtain, under what conditions and with what safeguards?

Laudon and Laudon (2007) have further elaborated these issues in the form of ethical, social, and political issues that can be raised by information systems. These are :

- **Information Rights and Obligations:** What information rights do individuals and organizations possess with respect to themselves? What can they protect? What obligations do individuals and organizations have concerning this information?
- **Property Rights and Obligations:** How will traditional intellectual property rights be protected in a digital society in which tracing and accounting for ownership are difficult and ignoring such property rights is so easy?
- **Accountability and Control:** Who can and will be held accountable and liable for the harm done to individual and collective information and property rights?
- **System Quality:** What standards of data and system quality should we demand to protect individual rights and the safety of society?
- **Quality of Life:** What values should be preserved in an information-based and knowledge-based society? Which institutions should we protect from violation? Which cultural values and practices are supported by the new information technology?

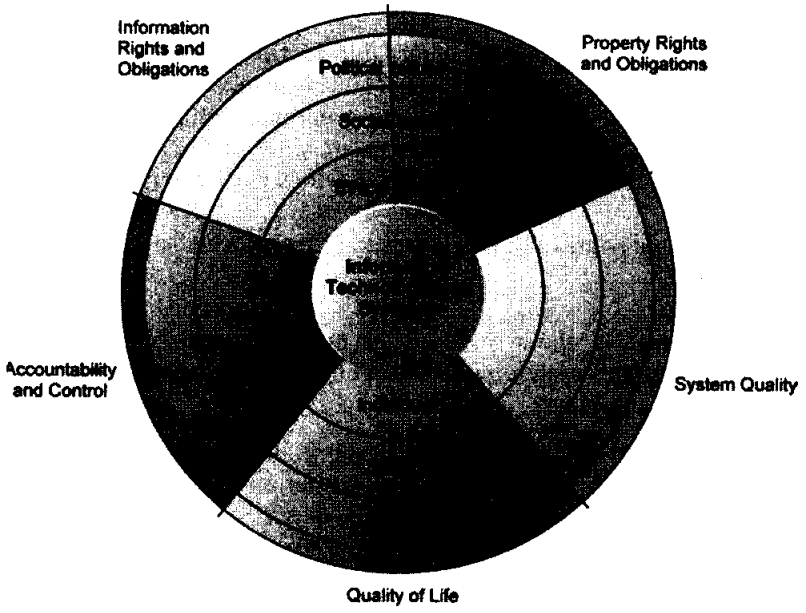


Figure 1 - Relationship between Ethical, Social and Political Issues in Information Society
(Source: Laudon and Laudon, 2007)

It is also seen that the introduction of new information technology has a ripple effect, raising new ethical, social, and political issues that must be dealt when opting for knowledge management.

3. Knowledge Management in Libraries

Brophy (2001) observed that the library and information sectors have experienced massive discontinuous changes within the last three decades. Dhiman (2003a) and Dhiman and Rani (2012) also mention that ICT has affected each and every sphere of human life. Library & information centres are not untouched to this effect. Thus, technological advances have changed the face of librarianship and have posed serious questions for libraries and the library professions. But these emerging challenges of acquiring and providing access to electronic knowledge resources require librarians to change their role from traditional librarian to information scientist by learning and applying new skills to understand the evolving technologies to manage and provide quality on-line information service to the knowledge society (Thamaraiselvi, 2009).

It is a fact that tacit knowledge resides within individuals or it becomes embedded in organizational routines and procedures. It is not verbal and so is difficult to articulate, codify, measure, spread and store. But explicit knowledge is less dependent on people and it can be codified, measured, spread or stored (Sangeeta and Suleta, 2007). The libraries have to apply knowledge management principles to provide effective library services and user satisfaction through the use of tacit and explicit knowledge. Sangeeta and Suleta further add that nowadays , there has been a significant advanced in ICT, which offer new possibilities to the knowledge management processes in libraries and enhanced traditional knowledge management methods and sources by new models and methods such as Digital library, Internet, Library Consortia and Expert System.

Library and information centers as the institutions are responsible for the collection, processing and storage of recorded knowledge for the purpose of reading, study and consultation; and the librarian as the professional is concerned with the collection, storage, processing and dissemination of recorded knowledge in a library (Aina, 2004). Here, knowledge management helps the librarians and library and information centers in providing efficient services to their users and also in improving the same for the benefits of their users.

The promotion of relationships in and between libraries, between libraries and users, and the strengthening of knowledge, Internet working, and increasing the pace of knowledge flows are some potential benefits of knowledge management (Shanhong, 2000). That is why; White (2004) argues that knowledge management is increasingly becoming a crucial tool in helping to provide a dynamic and effective service to library users in the 21st century.

4. Suggestions to Overcome the Problem

Digital libraries that have emerged due to the advancement of ICTs (Dhiman, 2003a; Dhiman and Rani, 2012) are the institutions which organize for the preservation of literature, their collection, organization and access in digital form. Vlădoiu and Negoiţă (2007) have defined the digital libraries as the focused collection of digital objects, along with methods for access and retrieval, as well as for selection and organization, and for maintenance of the collection.

Digital libraries are providing many advantages over traditional libraries, but simultaneously they have opened numerous challenges in front of librarians (Dhiman and Gupta, 2010). Basically, digital libraries contain the documents in two types of electronic form - offline and online. The documents can be born digital or converted digital. There is no problem in having born digital contents as they are created giving due consideration to the ethical issues, but the actual problem arises in converting old printed documents in digital format. Here, digital libraries have to take care of various issues as accuracy, intellectual property rights, confidentiality, integrity, and copyright law etc.

Mutula (2011) has elaborated some of the ethical issues which are of concerns in digital environment. These are narrated below.

- Library websites that contains errors will not meet the needs of users who may feel that their interests and needs are not being taken care of by content providers.
- Information on research portals may also link to information that does not necessarily belong to institutions offering the content, such institutions need to ensure that those accessing such information are insulated from any copyright violations arising thereof.
- Confidentiality must be there which ensures that only those with sufficient privileges and a demonstrated need may access certain information. Integrity, on the other hand, relates to the protection of content/information against corruption or the alteration of information. The integrity of information is threatened when it is exposed to corruption, damage, destruction or other disruptions to its authentic state.
- Trust building is important in a digital environment because users will be encouraged to operate in an e-environment where for instance the information they search for and access is accurate and reliable. Trust has its foundation in different disciplines based on some theoretical frameworks, such as the social-psychological model, the social cultural model or the institutional performance model. Trust is also implied in the various cross disciplinary models dealing with service quality and user satisfaction, information systems success, user acceptance model and the integrated trust building generic model.

So, we the librarians should take care of above issues positively. Lastly, the truth, freedom and human rights should not be violated at all while library and information centers go for opting knowledge management.

5. Conclusion

We see that knowledge management has been emerging as a trend of leading organization with transformation from manufacturing- oriented economy to service-oriented economy, where the role of

information and knowledge has become more prominent for all organizations. Therefore, knowledge management seems to be essential to manage resources and to handle different activities of libraries (Dhiman, 2003b; Dhiman and Gupta, 2008; Dhiman and Sharma, 2009) and it can help the libraries to achieve library's goals, but it requires a holistic and a multidisciplinary approach to management processes and an understanding of the dimensions of knowledge work.

It is worth to mention that Davenport and Prusak (1998) rightly observed a long time back that the awareness and application of knowledge have always been at the centre of librarians' work and, therefore, it is important that companies pursuing knowledge management should exploit the skills of people within librarianship. But their activities are to be shaped by ethical and legal norms. So, we should respect them in implementing knowledge management in libraries.

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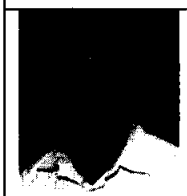
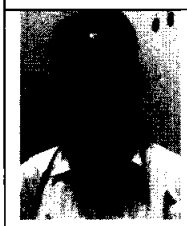
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File Format Selection for Digital Preservation

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Useful information is present in various forms comprising of analog and digital forms. These collections of information must be preserved for some uncertain future uses. The factor of "ease of use" of digital objects has directed the effort of preservation towards digital preservation of both born digital information and analog information converted into digital information. The fast-changing nature of the computer industry and the ephemeral nature of electronic data storage media are at odds with the key purpose of an archival system: to preserve information over a long period of time. To overcome these odds, one of the areas of current research is preservation file format of digital information. Newer formats are coming up with the objective of facilitating preservation over an indefinitely long time. In this work various requirements and challenges of digital preservation are discussed and suitability of file formats with regard to their potential for long term preservation is discussed and criteria for selection of preservation file format is identified

Digital Preservation, Preservation File format, Digital Migration

1. Introduction

Societal development depends largely on the use of information by scholars. The information content had been created in various forms comprising of analog and digital forms. The creators of information content are the hopefuls of its possible use in future by some scholar attempting to align his thinking with the content. Librarians bear the responsibility of preserving these information resources over a long indefinite time.

Since the start of the use of computers, hardware and software vendors are striving to squeeze each other out of the market, and thus, are continuously changing their products. As a consequence, there arises the problem of transferring data and programs from one computer to another and from one storage media to another. The destination computer or storage media might be supporting a completely different set of data and instruction formats. Taking into account the rapid evolution of technology, the life expectancy of the hardware, software versions and file formats, it is clear that migrations and conversions of all sorts are inevitable. No matter how well an archival system maintains its current holdings, it will eventually need to migrate much of its holdings to different media (which may or may not involve changing the bit sequences) and/or to a different hardware or software environment to keep them accessible. Digital preservation aims to keep digital objects accessible over long periods of time, ensuring the authenticity and integrity of these digital objects. While users have unmediated access to the content of an analog object such as books or photographs. A digital object always needs a software and hardware environment to render it. The arguments and issues related to the long term preservation of e-print and other institutional archives are outlined in Penfield & James (2003).

Digital archiving and preservation present unique research challenges because of concern with the long-term viability of digital information, where "long-term" may simply mean long enough to be concerned about the obsolescence of technology, or it may mean decades or centuries. Digital objects require constant and perpetual maintenance, and they depend on elaborate systems of hardware, software, data and information models, and standards that are upgraded or replaced every few years. The storage media, input and output devices, programming languages, software applications, and standards that are necessary to retrieve and interpret digital information are revised and replaced every few years.

Digital preservation for a long term requires a definite strategic planning. Walton (2003) suggests five categories11:

- Preserve old technology

- Emulate old technology
- Format migration
- Standardize formats
- Persistent object preservation

For the purpose of long-term preservation, generally, there are two approaches that are widely followed. They are (i) Migration approach, and (ii) Emulation approach.

Emulation strives to maintain the ability to execute the software needed to process data stored in its "original" encodings. Emulation uses a special type of software, called an emulator, to translate instructions from original software to execute on new platforms. The old software is said to run "in emulation" on newer platforms. This method attempts to simplify digital preservation by eliminating the need to keep old hardware working 9.

Migration changes the encodings overtime so that we can access the preserved objects using state-of-the-art software in the future. Data migration approaches abandon the effort to keep old technology working or to create substitutes that emulate or imitate it. Instead, these approaches rely on changing the digital encoding of the objects to be preserved to make it possible to access those objects using state-of-the-art technology after the original hardware and software become obsolete.

This paper intends to highlight the points to be considered while selecting the file format for digital preservation. For this purpose it is essential to understand the requirements and challenges of digital preservation.

2. Requirements of Digital Preservation

In order to define the scope and establish the context and objectives of digital preservation, we will identify the main requirements of digital preservation. Although the requirements of digital preservation depend upon the type, size and amount of data along with the preservation goals of the specific organization, a general outline of requirements is presented here based on what someone in the future would require from information stored today 5.

- **Reliability:** The system of digital preservation should be a reliable one so as to store data for an indefinite period without any data loss. Digital preservation requires that a copy of any preserved digital object survives over and above the system's lifetime, which is usually unknown, but may be as long as decades or even centuries.
- **Authenticity:** A digital object preserved over a long time is like an artefact, and thus, the authenticity of digital objects needs to be assured to the users along with its provenance, which is a common requirement for artefacts.
- **Integrity:** The information content of the digital object should remain intact and should not be let disturbed by its transfer from one system to another during its lifetime.
- **Scalability:** Dynamic nature of collections of digital preservation requires technical scalability to face technology evolution allowing, for instance, the addition of new components through incremental updates. Although it will not be necessary to add new components to increase the storage capacity, it may be necessary to replace components by others with more recent technology (in order to achieve lower maintenance costs or simply because the initial technology was disrupted). This also implies a requirement for supporting heterogeneity.

3. Challenges of digital preservation

Digital objects to be preserved include diversity of information with its long-term value and may include databases, text documents, sound and video recordings, images and dynamic multimedia productions. These objects are created on varied types of media and stored in a variety of formats in varied types of digital storage media.

The difficulty and expense of preserving digital information is a potential impediment to digital library development. Preservation of traditional material became more successful and systematic after libraries and archives integrated preservation into overall planning and resource allocation. Digital preservation is largely experimental and replete with the risks associated with untested methods. Digital preservation strategies are shaped by the needs and constraints of repositories with little consideration for the requirements of current and future users of digital scholarly resources. Some of the major challenges highlighted by Singh (2013) are discussed bellow.

- **Technical problems:** Hardware, software and file formats are continuously changing with rapid advancements in technology. These changes have posed challenges with information manager to frequently adapt to the newer technical setup.
- **Legal issues:** Maintaining integrity, authenticity, and provenance of digital material along with issue of copyright poses serious legal issues to be looked into carefully.
- **Organizational problems:** A prominent challenge with digital preservation is to organize the relationship between creators, providers and owners of digital organization. The workflow among these entities as well as preservation workers needs to be carefully looked into to carry a long term preservation strategy.
- **Context and metadata:** How should it be possible for someone in the future to understand the context of the information and the processes that created it? So, metadata of digital information needs to be stored along with the metadata related to preservation tools and processes. Preservation metadata is required for future preservation works.
- **Migration:** Migration is the most commonly used preservation strategy, especially for non-interactive digital objects such as images, databases or textual documents. Migration strategy and methods needs to be carefully looked into.
- **Authenticity and Context:** Probably, the biggest challenge in digital preservation is the preservation of the authenticity of the document's content within the context in which it was created.
- **Established Standards:** Another challenge is the absence of established standards, protocols, and proven methods for preserving digital information. With few exceptions, digital library research has focused on architectures and systems for information organization and retrieval, presentation and visualization, and administration of intellectual property rights.
- **Skills and Education:** The level of education of the general population in many developing countries is also a problem. This creates a challenge for digital preservation both in terms of collection building, especially for end-user submissions, and dissemination. Novel solutions are needed for both these problems to make digital archives effective.
- **Cost:** The cost implication has an important bearing on digital preservation because no institution has access to unlimited funds.

4. Selecting a digital file format for preservation

A format is a set of semantic and syntactic rules governing the mapping between abstract information and its representation in digital form. Handling file formats is an essential part of a long-term

archive. Most file formats fall out of fashion within a few decades, and unless action is taken at an early stage, many archived files will be incomprehensible blocks of bits.

The wide and constantly growing variety of file formats currently available ranges from simple formats like plain text, which consists of simple ASCII or Unicode characters, to more complex or compound file types. PDF or Microsoft Word files, for instance, can contain additional formatting information or images and tables, all of which have special properties. Going further, multimedia presentations add to this complexity, the characteristics of all kinds of embedded objects like image, video, or audio files.

For complex document types that are often used, we typically have a variety of different formats in competition with each other. Even for a simple text document with embedded graphics, there are many formats involved, e.g., M.S. Word, PostScript, DVI, PDF, LATEX and XML. The essential problem still to be solved is how to interpret the enormous variety of multimedia formats which give "meaning" to the conserved binary or text-based data streams. For interactive documents like hypertext, animations, or spreadsheets, we additionally require that reactions to user inputs be true to the original. The selection of file formats for creating electronic records should therefore be determined not only by the immediate and obvious requirements of the situation, but also with long-term sustainability in mind. Hendley (1998) has enumerated and analyzed a large number of document categories and their corresponding data formats 4, given below in Table 1.

Table.1: Document categories and standard formats; Source: Hendley (1998)

Category	**Data types**	**Standard File Formats**
Data	Alphanumeric data	PDF, PostScript, ASCII, CSV, SQL
Structured text	Alphanumeric, Image references, Markup	PostScript, PDF, TeX, DSSSL, SGML, HTML, XML
Office documents	Alphanumeric, Bitmap, Vector graphics, Animated graphics	PostScript, PDF, DSSSL, RTF, ASCII, SGML, TIFF, CGM
Design documents	Bitmap and Vector graphics, Alphanumeric data	HPGL, PostScript, EPS, DXF/DWG, IGES, CGM, TIFF, ASCII/RTC
Presentation graphics	Bitmap and Vector graphics, Alphanumeric data, Animated graphics	PostScript, PDF
Image	Bitmap graphics	PostScript, PDF, TIFF, GIF, JPEG
Audio	Audio data	MPEG-1 audio layers 1/2/3, MP3, MIDI
Video	Video data	MPEG-1, MPEG-2, MPEG-4
Geographical data (GIS)	Bitmap and Vector graphics, Alphanumeric data	PostScript, EPS, HPGL, TIFF, ASCII, CGM
Interactive multimedia	All	MPEG-1, MPEG-2

One of the problems with long-term preservation is that when unpacking an information package retrieved from an archive, we do not know the exact document format. For illustration, consider the following future scenario: The problem of physically storing digital data in a permanent way has been solved. However, what originally was a digital document has meanwhile become a mere bit-stream. The original document formats do not exist any more. A long time ago, we went over to have historic documents to be read out (or played) to us.

Preservation is defined as the activities required to keep materials in usable form for a long period of time. Long-term has no specific time limit; it is long enough to be concerned about changes in technology and changes in the user community. Preservation formats are those file formats that provide the best chance to achieve preservation, including the ability to capture the material into the archive and render and disseminate the information now and in the future. In some cases, this may be only a few years, while in other cases it may be for the life of the civilization. Arms & Fleischhauer, 2006 outlines the list of seven "sustainability" factors, given below, now contained in the digital Preservation website of Library of Congress, to evaluate the sustainability of any given format.

- **Disclosure:** Degree to which complete specifications and tools for validating technical integrity exist and are accessible to those creating and sustaining digital content. A spectrum of disclosure levels can be observed for digital formats. What is most significant is not approval by a recognized standards body, but the existence of complete documentation.
- **Adoption:** Degree to which the format is already used by the primary creators, disseminators, or users of information resources. This includes use as a master format, for delivery to end users, and as a means of interchange between systems.
- **Transparency:** Degree to which the digital representation is open to direct analysis with basic tools, such as human readability using a text-only editor.
- **Self-documentation:** Self-documenting digital objects contain basic descriptive, technical, and other administrative metadata.
- **External Dependencies:** Degree to which a particular format depends on particular hardware, operating system, or software for rendering or use and the predicted complexity of dealing with those dependencies in future technical environments.
- **Impact of Patents:** Degree to which the ability of archival institutions to sustain content in a format will be inhibited by patents.
- **Technical Protection Mechanisms:** Implementation of mechanisms such as encryption that prevent the preservation of content by a trusted repository.

Apart from "Sustainability" factors there are some "Quality and functionality" factors pertaining to the ability of a format to represent the significant characteristics of a given content item required by current and future users. These factors will vary for particular genres or forms of expression for content.

5. Conclusion

We have seen that there are various choices of file formats for each of the data types. Creators of information select the format as per their convenience. Their choice may not be fit for the purpose of preservation. So, it is the responsibility of professionals involved in digital preservation work to transform the users' format to a limited number of formats known as preservation formats.

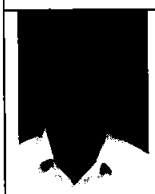
To disseminate the information and strive for standardization of formats among information producers, there are some registries of file formats functioning with their well defined objectives. The two popular registries are (i) Unified Digital Format Registry (UDFR) maintained by Library of Congress, and (ii) PRONOM developed by National Archives (UK). The objectives of these registries include assessing the risk associated with a digital format, collection audit, validating the ingest of a digital object with a new format, monitoring for technology obsolescence, identifying rendering conditions for a digital object, determining the appropriate migration path for a digital object, determining the format of a given digital object, and identifying the migration pathway for a format.

On the basis of discussions, it can be safely concluded that the choice of formats should be based on at least four basic criteria, i.e. (i) the specification must be freely available, (ii) there must be no patents or

licenses on the format, (iii) other established digital repositories should be using or have endorsed the format, and (iv) there should be a variety of writing and rendering tools available for the format.

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Knowledge Management Tools and Techniques in Changing Perspective

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Explosion of information and knowledge has impacted all organizations including library and information centre also. Conversion of knowledge from tacit to explicit and explicit to tacit is a high degree of personal commitment, and they will typically involve mental models, personal beliefs and values, and a process of reinventing yourself, your group, and the organization as a whole. In this dynamic era a systematic approach to the capture, structure, management, and dissemination of knowledge throughout an organization in order to work faster, reuse best practices, and reduce costly rework from project to project is most important. New technology innovations have been playing a vital role in knowledge management. This paper mainly focuses on the knowledge management tools that are supporting Integrated KM cycle and the process of Knowledge Conversion model.



KM tools, Knowledge conversion model, Integrated KM Cycle, Knowledge marketplace and Knowledge café.

1. Introduction

The advent of the Internet and the World Wide Web has made unlimited sources of knowledge available to us all. All of these developments have created a strong need for a deliberate and systematic approach to cultivating and sharing an organization's knowledge base. In other words, in order to be successful in today's challenging organizational environment, every organization need to learn from their past errors and improve their present as well as future. The ability to manage knowledge is becoming increasingly more crucial in today's knowledge society. The creation and diffusion of knowledge have become ever more important factors in competitiveness. Knowledge is being regarded as a valuable commodity that is embedded in products (especially high-technology products) and in the tacit knowledge of highly mobile employees. Although knowledge is increasingly being viewed as a commodity or an intellectual asset, it possesses some paradoxical characteristics that are radically different from those of other valuable commodities.

2. Tools and Techniques

Knowledge management, in practice, reflects a hierarchical view of knowledge to match the hierarchical view of the organization. Knowledge may originate anywhere in the organization, but under knowledge management it is channeled and gathered together in a knowledge base where it is distributed based on a predefined set of channels, processes and protocols. Knowledge management tools can be defined as tool, which support the performance of applications, activities or actions such as knowledge generation, knowledge codification or knowledge transfer. Not all tools are computer base but much emphasis is placed on these electronic tools due to their dynamic capabilities, quick evaluation, and organizational impacts. Seminars, meetings, symposiums, conventions and other informal social activities are the traditional KM tools. Some other important KM tools and techniques are supporting integrated KM cycle, following given-

- **Blogs:** A Blog is a very simple 'journal style' website that contains a list of entries, usually in reverse chronological order. The entries are typically short articles or stories, often relating to current events. However, the entries do not have to be just plain text. They could also be photographs, videos, audio recordings, or a mixture of all the types. A typical blog combines text, images and links to other blogs, web pages and other media related to its topic. The ability for readers to leave comments in an interactive format is an important part of most early blogs. Most blogs are primarily textual although some focus on photographs (photoblog), sketchblog, videos (vblog), or audio (pocasting), and are part of a wider network of social media. In essence, blogs offer an easy way for individuals, teams,

and entire organizations to capture and publish information about specific topics and to make this information available, automatically, to as wide an audience as they want.

- **After Action Review:** An after action review (AAR) is a tool to evaluate and capture lessons learned. It takes the form of a quick and informal discussion at the end of a project or at a key stage within a project or activity. It allows project team members to discover for themselves what happened, why it happened, and how to sustain strengths and improve on weaknesses. In the organization, much work results in the creation of new knowledge. By formalising the way this knowledge is extracted and recorded, it can readily be made available to colleagues and other organisations facing similar challenges. An AAR provides a quick way of making an informed decision about how to approach the next action. After action reviews were originally developed and are extensively used by the U.S. army. Their use has now extended to business as a knowledge management tool.

- **Knowledge café:** A knowledge café brings people together to have open, creative conversation on topics of mutual interest to surface their collective knowledge, to share ideas and to gain a deeper understanding of the subject and issues involved. It can be organised in a meeting or workshop format, but the emphasis should be on flowing dialogue that allows people to share ideas and learn from each other. It encourages people to explore issues that require discussion in order to build a consensus around an issue.

  A Knowledge Café is a way to have a group discussion, to reflect, and to develop and share any thoughts and insights that will emerge, in a very non-confrontational way. A Knowledge Café suspends all judgment and normally leads to developing deeper insights and sharing than usual.

  Participants arrange themselves into groups to discuss the question. Each participant in turn shares their knowledge and experience without interruption, giving everyone an opportunity to talk. Alternatively, a 'talking-stick' can ensure only the person holding the stick can speak, thus avoiding the discussion becoming dominated by one or a few speakers. After each participant has shared, the group continues the discussion together. The groups should eventually reconvene to exchange ideas and findings – these could be captured electronically or on paper.

- **Knowledge marketplace:** A knowledge marketplace could be seen as a 'dating service' for knowledge. It identifies what people know and what they need to know on a particular subject, then connects them appropriately. The knowledge marketplace can be facilitated online, via email or face-to-face. It can be used in many situations, and is particularly useful when delegating roles and responsibilities within a new project team. Success depends on the willingness of participants to both contribute and benefit in equal measure from exchanging knowledge. It is highly dependent on the degree of trust between individuals.

- **Knowledge Clusters:** Knowledge Cluster is a term given to a group that—as a result of coming together in this new way—create, innovate, and disseminate new knowledge. In other words, different individuals, teams, and organizations can now come together, virtually, on the Internet, to better communicate, collaborate, learn, and share knowledge through the cluster. The term is used, for example, to represent a group of companies in the same industry sector, e.g., high technology knowledge cluster, biotechnology knowledge cluster. There are Regional Knowledge Clusters where groups of organizations come together, regardless of their size, around specific topics. Often, there is a high incidence of innovation centres linked to local universities.

- **Communities of Practice:** Dr. Etienne Wenger and his team of social scientists were one of the early pioneers to establish the concept of Communities of Practice (COPs) through their study on apprenticeship as a learning model. They found that complex set of social relationships in apprenticeship that enabled learning effectively and named them Communities of Practice.

  A community of practice is a network of individuals with common problems or interests who get together to explore ways of working , identify common solutions , share good practice and ideas. Typically, they pool resources related to a specific area of knowledge. Informal communities exist in

some form in every organisation. The challenge is to support them so they can create and share organisational knowledge.

A CoP provides an environment (virtual and or face-to-face) that connects people and encourages the development and sharing of new ideas and strategies. This environment supports faster problem solving, cuts down on duplication of effort, and provides potentially unlimited access to expertise. Technology now allows people to network, share and develop practice entirely online. Virtual communities overcome the challenges of geographical boundaries. They encourage the flow of knowledge across local government and enable sustainable self-improvement.

- **Content Management System:** A Content Management System (CMS) is a computer application used to create, edit, manage, search and publish various kinds of digital media and electronic text. CMSs are frequently used for storing, controlling, versioning, and publishing industry-specific documentation such as news articles, operators' manuals, technical manuals, sales guides, and marketing brochures. A CMS is a software tool that enables group of (Centralised) technical and (de-centralised) non technical staff to store, create, edit, manage and publish a variety of digital content types to an intended audience, while being constrained during the content process by a centralised set of rules, process and workflows that ensure coherent, validated and managed electronic content is produced. These are some CMS software: Drupal, Joomla, Mediawiki and Zope.
- **Data Mining and Knowledge Discovery:** The data mining and knowledge discovery processes automatically extract predictive information from large databases based on statistical analysis (typically, cluster analysis). Using a combination of machine learning, statistical analysis, modelling techniques, and database technology, data mining detects hidden patterns and subtle relationships in data and infers rules that allow the prediction of future results. It is also possible to apply this technique and use these tools to mine content other than data—namely, text mining and thematic analysis and web mining— to look at what content, how often, for how long (e.g., number of hits), which is very helpful in content management. Similarly, skill mining or expertise profiling can be used to detect patterns in online curriculum vitae of organizational members. Expertise location systems can be automatically created based on the content that has been mined.
- **Groupware:** Groupware represents a class of software that helps groups of colleagues *(workgroups)* attached to a communication network (e.g., Local Area Networks [LANs]) to organize their activities. This technology may be used to communicate, cooperate, coordinate, solve problems, compete, or negotiate. While traditional technologies like the telephone qualify as groupware, the term is ordinarily used to refer to a specific class of technologies relying on modern computer networks, such as email, newsgroups, videoconferencing, teleconferencing, chat rooms, instant messaging, and phone text messaging (SMS). Groupware technologies are typically categorized along two primary dimensions:
    - Whether users of the groupware are working together at the same time ("real-time" or "synchronous" groupware) or different times ("asynchronous" groupware), and
    - Whether users are working together in the same place ("collocated" or "face-to-face") or in different places ("non-co-located" or "distance").
- **Peer Assist:** The Peer Assist is a tool which supports a 'learning before doing' processes in which advice is sought from someone else, or a group that has/have done something similar. This tool encourages participatory learning, by asking those with experience in certain activities to assist those wishing to benefit from their knowledge, through a systematic process, towards strengthened mutual learning. People can use a peer assist to gather knowledge and insight from other teams before embarking on a project or activity. It partners those seeking assistance ('receivers') with a peer or group of peers who have expertise in a desired area.
- **Knowledge Bank:** Knowledge Banks are online services and resources which hold information, learning and support: giving power to improve the council. They are typically used to showcase the

work of an organisation and provide signposts to documents, articles and toolkits. Examples of knowledge banks include:

- IDeA Knowledge (www.idea.gov.uk), see below
- Improvement Network (www.improvementnetwork.gov.uk)
- LGA data access initiatives (www.lgar.local.gov.uk), (www.local.gov.uk)
- Cochrane Collaboration in Health (www.cochrane.org)
- Teacher Training Resource Bank (www.ttrb.ac.uk)

- **Knowledge exchange:** A knowledge exchange takes place when someone is moving on from their current position. It aims to recover unique and valuable information from them before they leave. The knowledge exchange occurs between a knowledge holder and a facilitator. The knowledge holder is the person who is departing. The facilitator is typically a line manager or trusted team member – someone who is close to the leaver and can ensure the questioning is of sufficient depth and relevance. Ideally, the knowledge exchange will also involve the person replacing the knowledge holder or carrying out the tasks they leave behind. They will benefit from any useful tips and knowledge and from asking their own questions.

- **Collaborative Physical Workspace:** Readers may wonder why physical workspace is selected as one of top KM tools/techniques. Physical workspace in this context literally means the settings in which we actually work - or simply, physical aspects of our office. When we share or create knowledge, we usually interact with other people through face-to-face communication –we discuss, dialogue, or simply just ask a question. The physical workspace is where such human interactions take place – and it can support knowledge sharing/creation if it is well-designed. You may think "we have desks for everyone, meeting rooms for internal meetings, and space for business talk. What else do we need?" Actually, physical workspace works much more than that.

- **Wiki** :A wiki is a type of editable website that allows users to add, remove, or otherwise edit and change most content very quickly and easily, sometimes without the need for registration by using relatively easy to use wiki syntax. This means that everyone can edit, change or delete text in the wiki. Originally it is called as "Quickweb". Wiki is a composition system; it's a discussion medium; it's a repository; it's a mail system; it's a tool for collaboration. A wiki is one special type of knowledge base with very powerful uses in an organization. A wiki typically contains a page for each knowledge topic (a discussion page and an editing page for each knowledge topic, and a page to capture history of changes and revisions). A wiki tends to be open to many/all to collaborate, develop, and access new knowledge. The best example of a wiki is Wikipedia, the encyclopedia created by mass collaboration throughout the world. For all types and sizes of organization, the wiki is an extremely powerful KM tool for creating, maintaining, and accessing knowledge bases. Since the introduction of the wiki technology in the early 2000s, many organizations have adopted the wiki for many of their knowledge bases. For small and medium-sized enterprises (SMEs), in particular, the wiki is a key KM tool.

- **Collaborative Virtual Workspaces:** The Collaborative Virtual Workspace (CVW) is a prototype collaborative computing environment, designed to support temporally and geographically dispersed work teams. From a user's point of view, CVW provides a persistent virtual space within which applications, documents and people are directly accessible in rooms, floors and buildings. From a Technical point of view, it is a framework for integrating diverse collaborative capabilities.

- **Knowledge Mapping:** Knowledge mapping is a process by which organizations can identify and categorize knowledge assets within their organization –people, processes, content, and technology.It allows an organization to fully leverage the existing expertise resident in the company, as well as identify barriers and constraints to fulfilling strategic goals and objectives. It is

constructing a roadmap to locate the information needed to make the best use of resources, independent of source or form.

- **Brainstorming:** Brainstorming is a simple way of helping a group of people to generate new and unusual ideas. The process is actually split into two phrases: divergence and convergence. During the divergent phase, everyone agrees to delay their judgment. In other words, all ideas will be treated as valid. During the convergent phrase, the participants use their judgment but do so in a 'positive' manner—that is, they look for what they like about the ideas before finding flaws.

  Brainstorming works by focusing on a problem, and then deliberately coming up – without a predefined order- with as many original solutions as possible, pushing ideas to the limit. The basis of brainstorming is generating ideas, individually or in a group, based on principle of suspending judgment: a principle which scientific research has proved to be highly productive in individual efforts as well as in group effort.

3. Conclusion

Knowledge management has been identified as the major and important initiative that is helping organizations, institutions and information centres to utilize the very fruit of information technology in fulfilling the objectives of parent organization. The availability of new IT offshoot technologies, particularly Internet and WWW, has been instrumental in catalyzing the knowledge management. To conclude it would be say that Knowledge Management is not managing or organizing books or journals, searching the internet for clients or arranging the circulation of materials only but also sharing the ideas and experience of employees, customers. IT based Knowledge Management tools and techniques are increasing in knowledge sharing which is facilitated through information and communication technologies (ICTs) including computers, telephones, e-mail, databases, data-mining system, search engine, video-conferencing equipment and many more.

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Metadata Standards for Open Educational Resources

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One of the most important components of an e-learning system is the learning material. The widespread adoption of e-learning has led to the development of many learning object repositories that store high quality learning materials specifically created for e-learning. Resource discovery of learning materials can be made effective by semantically tagging them with standard metadata. This paper highlight the use of metadata in e-learning systems with a review of the most widely used metadata standards for Open Educational Resources.



Metadata Standards, Open Educational Resources, Learning Objects, E-learning, Learning Resource Metadata Initiative, Dublin Core, IEE LOM

1. Introduction

An e-learning system should ensure the maximum use of these learning objects through efficient retrieval mechanisms. To increase the visibility of learning objects it should be properly tagged with a set of metadata which describes educational artifacts such as the subject content, intended user group etc. Metadata is fundamental to effective retrieval and use of digital materials, as well as the organization, preservation, and management of those materials in the digital environment. To fulfill the above purposes different types of metadata can be used. Descriptive metadata can be used for describing or identifying information resources. Structural metadata documents relationships among objects. Administrative metadata provides information to help manage a resource and "Use metadata" tracks the level and type of use of information resources (Gilliland, 1998).

However, sharing and reuse of learning objects across various repositories or learning management systems can be achieved only by using a common metadata standard for describing the learning object. For the description of learning objects there are several metadata standards available and the selection of an ideal metadata standard is very important for ensuring maximum visibility and interoperability between learning object repositories. Use of metadata standards, automatic metadata generation, staff capacities and interoperability are some important areas of research related to metadata and metadata management.

2. Open Educational Resources

In 2002, UNESCO convened a group of academics to study impact of the OpenCourseWare initiative of the Massachusetts Institute of Technology (MIT) on higher education institutions in developing countries. The forum coined the term 'Open Educational Resources (OER)' and they defined it as "The open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for noncommercial purposes" (UNESCO, 2002).

In its simplest form, the concept of Open Educational Resources describes any educational resources (including curriculum maps, course materials, textbooks, streaming videos, multimedia applications, podcasts, and any other materials that have been designed for use in teaching and learning) that are openly available for use by educators and students, without an accompanying need to pay royalties or license fees (Butcher, 2011).

The major difference between OER and any other educational resource is its license. Thus, an OER is simply an educational resource that incorporates a license that facilitates reuse, and potentially adaptation, without permission from the copyright holder.

3. Importance of Metadata in E-Learning Systems

ALCTS (Association for Library Collections and Technical Services) Task Force on Metadata (2000) defines metadata as "structured, encoded data that describe characteristics of information-bearing entities to aid in the identification, discovery, assessment, and management of the described entities". Moreover metadata is also a tool for the management of information resources, whether they are electronic and available on the Internet or in physical format; metadata enables the management of the lifecycle wherein the resources are created, modified and used.

One of the requirements for a federated information system is interoperability, the ability of one computer system to access and use the resources of another system (Komatsoulis, 2008). The interoperability between e-learning systems will ensure wider reach of the learning objects to the intended users. Properly provided metadata can act as a key to interoperability (Haynes, D, 2004). Similar to traditional cataloging and indexing, metadata performs three main functions. It supports resource discovery, locates the specific resource by inclusion of a digital identifier, and organizes electronic resources into collections bringing similar resources together and distinguishing dissimilar resources. In addition it provides information needed to administer and manage the collection. Technical metadata is needed to allow digital objects to be re-presented in new technical environments.

A metadata scheme has three components – semantics, content and syntax. An extension adds elements to an existing scheme to describe a particular resource type, handle material on a particular subject, or address the needs of a particular user community. Profiles are subsets of a larger scheme that are implemented by a particular user community. Metadata can be embedded in an electronic resource or stored in a separate file.

4. Important Educational Metadata Standards

Metadata standard is the set of metadata elements and rules for their use that have been defined for a particular purpose. In common usage, the terms scheme, schema and standard are used interchangeably. A metadata scheme is the set of descriptor types available to be applied to information. Numerous standard schemes have been developed to address specific information use and management needs. These standards have emerged from the needs of specific interest groups to standardize how they classify information. Many different metadata schemes are being developed in a variety of user environments and disciplines.

Several educational metadata standards have been proposed over time in order to better describe learning objects. A widely adopted metadata element set for this purpose is IEEE Learning Object Metadata (LOM), a standard which has been designed especially for the description of educational resources. Apart from LOM, other well known metadata standards designed to be used in the field of education are IMS and Dublin Core. The latest entrant in this category is the Learning Resource Metadata Initiative (LRMI) which is an extension of the Schema.org.

It is observed that, in practical scenarios a single metadata schema may not be adequate for efficiently describing learning objects. In order to overcome this problem, the use of "Application Profiles" is proposed. According to Rachel Heery and Manjula Patel (2000) application profiles consist of data elements drawn from one or more namespace schemas combined together by implementors and optimised for a particular local application. Application profiles are useful as they allow the implementor to declare how they are using standard schemas. The goal is to efficiently fulfill the application's special needs and to retain interoperability with its base schema. Therefore, applications that utilize application profiles can benefit by exploiting the features of an existing schema and by enriching them with desired characteristics. Some popular application profiles are CanCore and Sharable Content Object Reference Model (SCORM).

- **The IEEE Learning Object Metadata:** The IEEE 1484.12.1 – 2002 Standard for Learning Object Metadata is an internationally recognised open standard published by the IEEE Learning Technology

Standard Committee (IEEE LTSC) for the description of learning objects. IEEE 1484.12.1 is the first part of a multipart standard, and describes the LOM data model. The LOM data model specifies which aspects of a learning object should be described and what vocabularies may be used for these descriptions; it also defines how this data model can be amended by additions or constraints.

For this standard, a metadata instance for a learning object describes relevant characteristics of the learning object to which it applies. The conceptual data schema specified in this part permits linguistic diversity of both learning objects and the metadata instances that describe them. This conceptual data schema specifies the data elements which compose a metadata instance for a learning object.The LOM defines the minimal set of attributes to manage, locate and evaluate learning objects. These attributes or Data Elements are grouped in to nine categories:

- **General category** groups the general information that describes the learning object as a whole.
- **Lifecycle category** groups the features related to the history and current state of this learning object and those who have affected this learning object during its evolution.
- **Meta-Metadata** category groups information about the metadata instance itself (rather than the learning object that the metadata instance describes)
- **Technical category** groups the technical requirements and technical characteristics of the learning object.
- **Educational category** groups the educational and pedagogic characteristics of the learning object.
- **Rights category** groups the intellectual property rights and conditions of use for the learning object.
- **Relation category** groups features that define the relationship between the learning object and other related learning objects.
- **Annotation category** provides comments on the educational use of the learning object and provides information on when and by whom the comments were created.
- **Classification category** describes this learning object in relation to a particular classification system

Within each category is a hierarchy of data elements to which the metadata values are assigned. Examples of learning-related metadata elements found in the Education category are Typical Age Range (of the intended user), Difficulty, Typical Learning Time, and Interactivity Level.

IEEE 1484.12.3 - 2005 Standard for eXtensible Markup Language (XML) Schema Binding for Learning Object Metadata Data Model defines how LOM records should be represented in XML; it does so not by providing a single XML Schema but by providing several options which can be tailored to particular application profiles of the data model.

- **IMS Metadata:** The IMS Global Learning Consortium (http://www.imsglobal.org/) develops and promotes the adoption of open technical specifications for inter operable learning technology. Their Meta-Data Information Model Specification is based on the IEEE LOM scheme with only minor modifications. The latest version of the IMS Learning Resource Meta-Data specification (Version 1.3) adopts the IEEE data model and XML binding, and provides best practice guidelines for their use. These guidelines allow the software developers and the implementers to create instructional materials that are inter operable across authoring tools, learning management systems, and run time environments.
- **Dublin Core:** The Dublin Core Metadata Initiative (http://dublincore.org/) is an open forum engaged in the development of interoperable online metadata standards that supports a broad range of

purposes and business models. The Dublin Core standard includes two levels: Simple and Qualified. The simple Dublin Core contains fifteen elements. The elements are Title, Subject, Description, Type, Source, Relation, Coverage, Creator, Publisher, Contributor, Rights, Date, Format, Identifier and Language. The qualified Dublin Core includes three additional elements Audience, Provenance and Rights Holder, as well as a group of element refinements (also called qualifiers) that refine the semantics of the elements in a way that may be useful in resource discovery.

The Dublin Core metadata contains metadata elements useful for general purpose applications but it does not contain attributes describing the pedagogical perspective of a document. In order to cope with educational concerns, DC-Education Application Profile has been proposed.

The DC Education Working Group has proposed a schema for describing educational resources. Along with that a joint DCMI/IEEE LTSC Task Force was also constituted. The recommendation of the DC Education Working Group suggests a schema incorporating:-

- Various standard DC elements and recommended qualifiers
- DC Education 'namespace' (domain specific) extensions such as
    - DCEducation Element: audience
    - DCEducation Audience qualifier: mediator
    - DCEducation Element: standard
    - DCEducation Standard qualifier: identifier
    - DCEducation Standard qualifier: version
    - DCEducation Relation qualifier: conforms to
- Various IEEE Learning Object Metadata (LOM) elements such as
    - InteractivityType
    - InteractivityLevel
    - TypicalLearningTime

We can see from this schema extract that it consists of DC 'standard' elements, domain specific additions to recommended standard DC elements, and particular elements from name spaces such as IEEE LOM.

- **Learning Resource Metadata Initiative:** In June 2011, major search engines Bing, Google, and Yahoo (later joined by Yandex) formed Schema.org to create a standard method of tagging webpages across the Internet with descriptive and semantic metadata, sometimes called microdata. The goal is to create a standardized schema for webmasters to use for markup to ensure the maximum benefit for their efforts and to aid users who utilize these tags in online search queries. On - page markup helps search engines understand the information on web pages and provide richer search results. A shared markup vocabulary makes easier for webmasters to decide on a markup schema and get the maximum benefit for their efforts. Search engines want to make it easier for people to find relevant information on the web. Markup can also enable new tools and applications that make use of the structure.

  The Learning Resource Metadata Initiative (LRMI) is a project led by Creative Commons (CC) and the Association of Educational Publishers (AEP) to establish a common vocabulary for describing learning resources. The project has developed a standard metadata framework for tagging learning resources online. The vocabulary is the first independently developed industry-specific framework addressing education that is designed to work with schema.org, thereby improving the practical search and discovery of learning resources online. A common framework for tagging and organizing learning resources will increase the interoperability and transparency of OER repositories.

5. LRMI Specification

The LRMI specification is a collection of properties to describe educational resources. It builds on the extensive vocabulary provided by Schema.org, and predominantly, Schema.org/Creative Work and the LRMI-created Educational Audience. Version 1.1 of the LRMI specification has been accepted into Schema.org with the exception of use Rights Url. Different properties of learning resources as defined by the LRMI specification Version 1.1 is shown in the Table 1.

Table 1 - LRMI specification - Version 1.1

Property	Expected Type	Description
educationalRole	schema.org/Text	The role that describes the target audience of the content.
educationalAlignment	schema.org/AlignmentObject	An alignment to an established educational framework.
educationalUse	schema.org/Text	The purpose of the work in the context of education. Eg: "assignment", "group work"
timeRequired	schema.org/ Duration (ISO 8601)	Approximate or typical time it takes to work with or through this learning resource for the typical intended target audience. Eg: "P30M", "P1H25M"
typicalAgeRange	schema.org/Text	The typical range of ages the content's intended end user. Eg: "7-9", "18-"
interactivityType	schema.org/Text	The predominant mode of learning supported by the learning resource. Acceptable values are active, expositive, or mixed. Eg: "active", "mixed"
learningResourceType	schema.org/Text	The predominant type or kind characterizing the learning resource. Eg : "presentation", "handout"
useRightsURL	schema.org/URL	The URL where the owner specifies permissions for using the resource. Eg:"http://creativecommons.org/licenses/by/3.0/"
isBasedOnURL	schema.org/URL	A resource that was used in the creation of this resource. This term can be repeated for multiple sources.
Name	schema.org/Text	The title of the resource.

Schema.org already defines the metadata schema for basic information about material on the Web, such as a "Creative Work" in the form of a "Book," which has metadata like author, publisher, datePublished, etc. It also defines specific metadata for types like Article, ImageObject, AudioObject, VideoObject, and so forth. LRMI identified five properties that are already covered by schema.org which are relevant to learning objects. The properties already defined by schema.org and identified by LRMI as relevant to learning objects are shown in the Table 2.

Table 2: Properties of learning resource that are currently covered by Schema.org

Property	Expected Type	Description
Name	schema.org/Text	The title of the resource.
About	schema.org/Text	The subject of the content.
Date Created	schema.org/Date	The date on which the resource was created.
author	schema.org/ Person	The individual credited with the creation of the resource.
publisher	schema.org/ Organization	The organization credited with publishing the resource.
inLanguage	schema.org/ Language	The primary language of the resource.

LRMI extends the work being done by Schema.org that aims to standardize website markup in general. LRMI can become the de facto standard for tagging educational content online, it's what the search engines will look for when they crawl the web for learning resources.

6. Conclusion

The development and adoption of new xml schema based metadata standards shows the influence that search engines, like Google, have in making open educational resources discoverable. In this new scenario it becomes the responsibility of the individual and the institution to ensure the OERs they create are appropriately described and that metadata is optimized for search and retrieval. The better an OER is tagged with proper metadata the more it reaches to the intended audience.

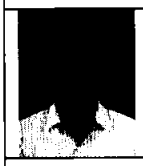
The development of Linked Data technologies based on RDF (Resource Description Framework) specifications has also made its impact on the way in which educational resources are described for the semantic web. Dublin Core vocabularies have been represented in an RDF Schema and hence Dublin core continues as an important metadata standard for describing educational resources.

As all the major search engines are using schema.org for semantic indexing and LRMI specification is accepted into Schema.org it seems that LRMI will soon become the de facto metadata standard for Open Educational Resources. As search engines begin using the LRMI specification and as a critical mass of educational content is tagged in a consistent manner, filtering this content will become substantially easier, allowing educators, students, and others to find relevant educational resources.

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Ongoing Development of Digital Preservation: an Indian Perspective

Dr. O.N. Chaubey



This paper presents an overview of the coordinated efforts of Department of Electronics and Information Technology, Govt. of India and C-DAC Pune in envisaging the Indian National Digital Preservation Programme. It also describes tools, techniques, standards for digital preservation along with draft national policy in this regard.



Digital Preservation; Digital Preservation-Tools and Techniques; Knowledge Management

Introduction

The digital universe in India is expected to grow 23 fold between 2012-2020. The digital bits captured or crated each year in the country is expected to grow from 127 exabytes to 2.9 zettabytes between 2012 and 2020. Asia's giants India and China together would account for the 29% of the total digital universe in 2020 which is estimated to be 40 zettabytes. The explosion of digital information has caught most of Institutions unprepared to handle the threats posed by rapidly changing technologies and digital obsolescence of computer hardware, software, file formats and storage media. The possibilities of data corruption, physical damage and disasters continue to endanger digitally encoded information. The legal, financial, and administrative consequences of loss of digital information pose major concerns.

In this context, the need and relevance of digital preservation is already recognized by UNESCO which has decided to play active advocacy role to make digital preservation frameworks and practices as per the Vancouver Declaration. It is challenging to ensure the accessibility, readability, usability, reliability and authenticity of such digital information over a long period. The ephemeral and intangible nature of digital information demands continuous and active management for its long term preservation. It requires the development of digital preservation best practices, methods, tools, systems, and infrastructural setup including trusted and sustainable digital repositories.

The R&D in IT Division, Department of Electronics and Information Technology, Government of India recognized the need of digital preservation way back in 2007 and decided to involve the R&D team at Centre for Development of Advanced Computing(C-DAC), Pune in envisaging the National Digital Preservation Programme. Since then several millstones have been accomplished which are briefly reported as under.

National Study Report on Digital Preservation Requirements of India, 2010

During this study, it was observed that with the ever increasing proliferation of Information Technology, the volume of digital information generated by the government, private and social sectors is exponentially growing. This digital content, thought ephemeral and non-tangible in nature, forms a significant part of human heritage for future generations which is contently threatened due to digital obsolescence and frequent changes in the technologies. In this context, long term digital preservation has emerged as a new interdisciplinary area of research and development to ensure that the digital information preserved in its original, readable and trustworthy form in spite of obsolescence of everything: hardware, software, processes, format, people, etc.

The study revealed that India is extremely vulnerable to loss of digital information and bitter legal consequences in the absence of national digital preservation infrastructure and policy, as Government of India is hugely investing in the computerization and digitalization of its departments at national, state and district. The Information Technology Act, Public Records Act, Right to Information Act and several other laws categorically specify the statutory obligation to retain or preserve the e-records and the digital surrogates produced using computer or other devices by the government organizations. In case of failing to reproduce

the digital information in its original, authentic, reliable form and within stipulated time-frame it can lead to penal consequences. Therefore, Government of India must equip itself in the defense of the digital information by creating long-term digital preservation policies, techniques, tools and infrastructures for the benefits of all organizations across diverse domains.

This report includes the overview of international digital presentation projects, study of legal imperatives, various technical standards, and the consolidation of recommendations given by the national expert group which included archivists, technologists and stakeholders representatives of 30 organizations from diverse domains such as e-governance, government records, audio, video, and film archives, cultural heritage, health, science and education, insurance and banking, law, etc. It specifies the short term and long term action plans with specific R&D projects to be initiated under the National Digital Preservation Programme. The report provided to be recommendation to establish the Centre of Excellence for Digital Preservation to develop the necessary technical competencies, pilot digital repositories and international collaborations.

Centre of Excellence for Digital Preservation, 2011

As recommended in the national study report, as a flagship project under the Indian National Digital Preservation Programme, Department of Electronics and Information Technology (DeitY) approved the Centre of Excellence for Digital Preservation project to be executed by C-DAC Pune with the following objectives.

Objectives

- Conduct research and development in digital preservation to produce the tools, technologies, solutions and infrastructures to ensure that the digital information remains discoverable, accessible, readable, usable, reliable, authentic and trustworthy on long term basis.
- Develop the digital preservation repositories and provide help in nurturing the network of Trustworthy Digital Repositories (national digital preservation infrastructure) as a long-term goal.
- Define the digital preservation standards by involving the experts from stakeholder organizations, consolidate and disseminate the best practices generated through various digital preservation projects implemented across India.
- Build the technical competencies, necessary for the audit and certification of trustworthy digital repositories, curriculum design and training for data managers, e-records keepers and archivists.
- Spread awareness about the potential threats and risks due to digital obsolescence, the digital preservation best practices and maintain technology watch on continuing basis.

Collaborations

In the pilot projects, C-DAC Pune has established collaborations with National Archives of India (Pilot Digital Repository of Government Archives), Computer Aided Registration of Documents (CARD) project of Stamps and Registration Department, State Government of Andhra Pradesh (Pilot Digital Repository of CARD data), e-District Mission Mode Project of NeGP, and Indira Gandhi National Centre for the Arts (Pilot Digital Repository of Cultural Digital Data). As part of this project, C-DAC Noida is also developing the pilot digital repository for e-Court Mission Mode Project.

Digital Preservation Tools and Technologies

The team of Centre of Excellence for Digital Preservation at C-DAC, Pune has undertaken the development of following digital preservation tools and technologies:

e-Records Digitalaya

e-Records Digitalaya is a specialized archival system being designed and developed for the preservation and repository management of electronic records produced through various e-governance applications. In the current scope, this system is being developed for the pilot digital repository at Computer Aided Registration of Documents (CARD), C & IGRS, Hyderabad, Andhra Pradesh, India and e-District pilot project.

Datantar for Capturing of e-governance Records

Datāntar word is a fusion of two words from English and Hindi languages. 'Data' means digital object and in Hindi language 'antar' means transformation. Therefore, 'Datāntar' means to convey transforming the data in order to make it preserved. Datantar is a software which can connect with the e-governance database and capture the electronic records along with preservation metadata as per the eGOV-PID standard.

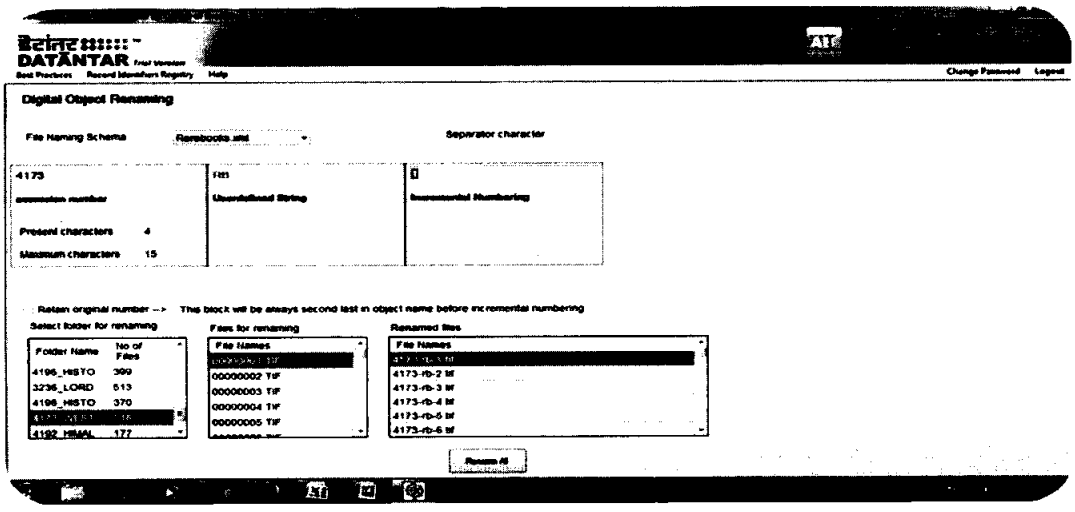
Abhilekh Digitalaya

Abhilekh Digitalaya is a specialized archival system designed and developed for the preservation of digital copies of government records, microfilms, cartographic maps, photographs and various types of documents available with national, state and district level archives. This system is being developed for the pilot digital repository at National Archive of India, New Delhi, India which is expected to receive digital records from ministries and central government organizations.

Datantar for Reformatted Digital Content

*Datāntar software provides a set of best practices such as content organization, watermarking, OCR, naming conventions, tagging, structuring, production of low resolution copy for dissemination, etc. for image, audio and video formats. It delivers the valid Submission Information Package (SIP) as per the requirements of OAIS.*This software can be applied for aligning and reformatting the digital content in terms of images, audio, video, PCDs etc for preservation purpose.

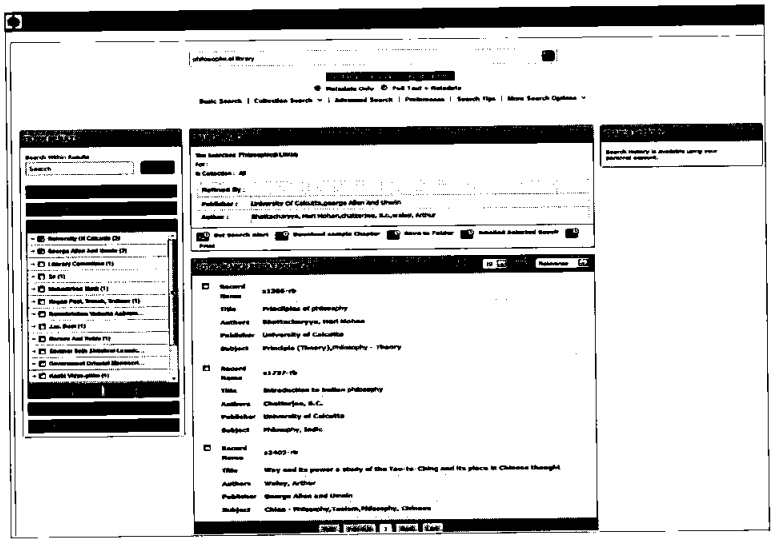
Datāntar system



Sanskriti Digitalaya

Sanskriti Digitalaya is a specialized archival system designed and developed for the preservation of cultural digital data in terms of images, audio, video, PCDs, 3D models etc. This system is being developed for the pilot digital repository at Indira Gandhi National Centre for the Arts, New Delhi, India.

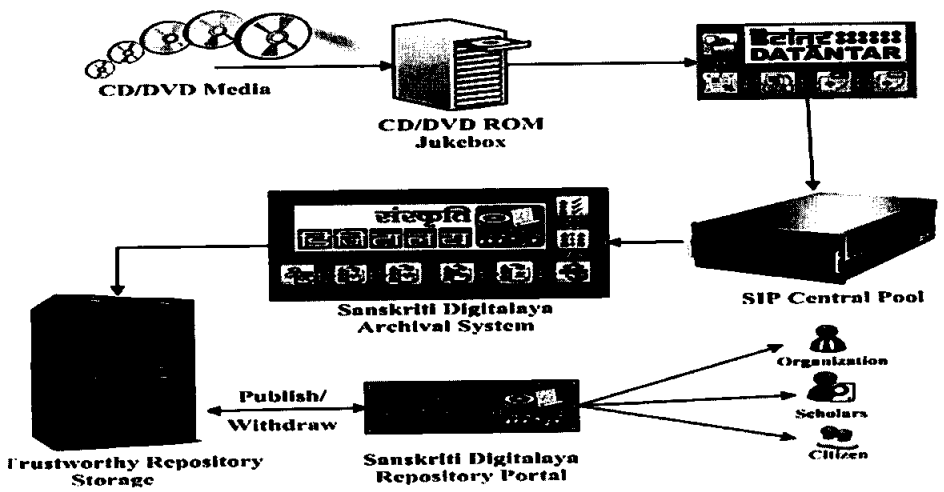
Sanskriti Digitālaya Repository Portal



Before processing digital data through Sanskriti DigitālayaTM Archival System, data is required to be organized in the form of Submission Information Package (SIP) using DatāntarTM system. These SIPs are generated by Producers and sent to the Archival system. Producers are participating institutes having cultural digital data which deliver SIPs to the Archival system. Sanskriti DigitālayaTM Archival System fully complies with ISO standard on Open Archival Information System (OAIS) reference model. If any digital content is need to be preserved then it should follow the guidelines of OAIS model. Under the OAIS model, digital content is transmitted to the Archival system in a form called a Submission Information Package (SIP).

The system's ingest process validate, accepts and analyze the SIP and archives its contents according to a specific preservation plan for long-term preservation. Our system produces the Archival Information Package (AIP) and manages to ensure its integrity, security and future accessibility. When a user requests for a particular digital object or a group of objects from the Sanskriti DigitālayaTM Repository Portal, then Dissemination Information Package (DIP) is configured comprising the object and relevant metadata, as per the assigned rights and privileges of the user. Sanskriti DigitālayaTM system is aimed at supporting all the file formats used in the cultural heritage domain such as images, audio, video, slides and manuscripts and metadata schemas like MARC21, MODS, Dublin Core, METS, etc.

Architecture Of Digital Preservation Process



Digital Preservation Planner (Pre-Planner)

Digital preservation planner software provides a searchable database of records retention rules and policies formulated by various ministries and departments of government of India. It also allows the users to define file format specifications for images, audio and video data for estimating the digital storage requirements.

The above mentioned software tools are being developed adequate compliance with the guidance provided in various ISO standards. The functional prototypes of some of these tools are currently in the testing phase.

Digital Preservation Standards and Best Practices, 2013

The team of Centre of Excellence for Digital Preservation at C-DAC, Pune along with the Expert Committee has developed the following digital preservation standard and best practices for e-governance to ensure that the electronic records are produced in a preservable manner. The digital preservation standard has been notified and adopted for all e-governance applications by the Ministry of Communications and Information Technology, Government of India.

Best Practices and Guidelines for Production of Preservable Electronic Records

This standard provides the best practices and guidelines for production of preservable electronic records and its management in the context of e-governance. It is applicable for those e-records that need to be retained for long durations (e.g. 10 years, 25 years, 50 years and beyond) and the e-records that need to be preserved permanently. The core concepts of 'preservability' are based on the requirement specified in IT ACT, ISO/ TR 15489-1 and 2 Information Documentation-Records Management and ISO 14721 Open Archival Information Systems (OAIS) Reference Model. It introduces 5 distinct steps of e-record management i.e. e-record creation, e-record capturing, e-record keeping, e-record transfer to trusted digital repository and e-record preservation which need to be adopted in all e-governance projects.

Standard for Preservation Information Documentation (eGOV-PID) of Electronic Records

It provides the standard metadata dictionary and schema for describing the "preservation metadata" of an electronic record. This standard proposes to capture most of the preservation information (metadata) automatically after the final e-record is created by the e-governance system. Such preservation information documentation is necessary only for those e-records that need to be retained for long durations (e.g. 10 years, 25 years, 50 years and beyond) and the e-records that need to be preserved permanently. This standard allows to capture the preservation metadata in terms of cataloging information, enclosure information, provenance information, fixity information, representation information, digital signature information and access rights information. The implementation of this standard helps in producing the valid input i.e. Submission Information Package (SIP) for archival and preservation purpose as per the requirements specified in the ISO 14721 Open Archival Information Systems (OAIS) Reference Model.

Draft national digital preservation policy and digital preservation rules under the IT Act 2000/ 2008

As instructed by Department of Electronics and Information Technology (DeitY), the team of Centre of Excellence for Digital Preservation at C-DAC, Pune has drafted the National Digital Preservation Policy and Digital Preservation Rules under the IT Act 2000/ 2008. DeitY is expected to organize the consultations with various experts and government departments to finalize the policy and rules.

The policy and rules are meant to offer an overarching mandate across various domains and organizations and help in developing the national digital preservation infrastructure in the form of Trusted Digital Repositories in India.

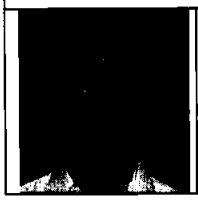
Conclusion

The paper establishes a benchmark in the domain of national digital preservation infrastructure. This will guide and give directions to all the future initiatives in digital preservation landscapes. Draft National Rules and policy in this regard requires to be finalized on high priority. National digital preservation policy and digital preservation rules under the 2000/ 2008 Act should be finalized.

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Overview of Knowledge Management and Academic Libraries

Mrinal Kanti Mondal **Narender Singh Shokeen** **Kiran Lata**



The emerging field of knowledge management offers academic libraries the opportunity to improve effectiveness, both for themselves and for their parent organizations. This article provides an overview of the concept of knowledge management with its different dimensions, the transformation process from data to knowledge, the knowledge creation model and some definitions. Some applications in academic libraries and higher education system as well as the similarities and differences between knowledge management and academic library practices have been discussed.



Knowledge, management, knowledge management, Information Audit, knowledge management strategy, knowledge management system, Academic Libraries

1. Introduction

Knowledge Management (KM) is the hottest topic today's knowledge based societies in both the industry world and the information research world. In this society the human knowledge is the prime source of power. KM is very essential to get the right knowledge to the right person at the right time. This in itself may not seem so complex, but it implies a strong tie to corporate strategy, understanding of where and in what forms knowledge exits, creating process that span organizational functions and ensuring that initiative are accepted and supported by organizational members. KM may also include new knowledge creation, or it may solely focus on knowledge sharing, storage, and refinement.

It is important to remember that KM is not about managing knowledge for knowledge's sake. The overall objective is to create value and to leverage, improve, and refine the organizational competences and knowledge assets to meet organizational goals and targets. Implementing KM thus has several dimensions.

2. Different dimension of KM

The first dimension consists of the activities that are critical to knowledge creation and innovation, knowledge exchange, capture, reuse and internalization. Collectively, these processes build a learning organization where one can capable of creating, acquiring, and transferring knowledge as well as adapting its actions to reflect new insights and innovations. The second dimension consists of those elements that enable or influence knowledge creation activities. These include KM Strategy, Measurement, Organization Policy, Organization Culture, Organization Process, Management and Leadership, Technology etc.

- **KM Strategy:** KM strategy must be dependent on corporate strategy. The objective is to manage, share, and create relevant knowledge assets that will help meet tactical and strategic requirements. "Knowledge Management encompasses both the management of information and the management of people. Knowledge cannot be managed directly - only the information about knowledge processed by people in organizations can be managed" (Streatfield and Wilson, 1999). This statement is an example of the emerging recognition that sound information management practices create a solid foundation on which successful knowledge management strategies can be developed.

The first step in any knowledge management program is to identify where knowledge is being created, where it already exits and where it is needed to support decisions and actions. There is no generic model for developing a knowledge management strategy as each organization has unique needs that must be identified and understood. For developing or improving the knowledge management strategy information audit may be regarded as the first step.

- **Information Audit:** Information audit is the systematic process through which an organization can understand its knowledge and information needs, what it knows, the information flow or goals.

Though there is no universal accepted definition of an information audit yet Aslib (the Association for Information Management, UK) defined it as "a systematic evaluation of information use, resources and flows, with verification by reference to both people and existing documents in order to establish the extent to which they are contributing to an organization's objectives".

An information audit is a process used to:

- Identify the information needs of the organization and assign the level of strategic importance to those needs;
- Identify the recourses and services currently provided to meet those needs;
- Map information flows within an organization and between an organization and its external environment;
- Avoid inefficiencies and duplication of information;
- Avoid information overload;
- Save real time and money through efficiencies;

So the ultimate result of an information audit is to create a "Information Map "which can be used as the basic for designing the solutions, as well as for the foundation of a corporate information strategy or a knowledge management strategy.

- **Measurement:** The measures or metrics captured to determine if KM improvement is occurring or if a benefit is being derive;
- **Organizational Policy:** The written policy or guidance provided by the organization;
- **Organizational Culture:** The organizational culture influences the way people interact the context within which knowledge is created, the resistance they will have towards certain changes, and ultimately the way they share (or the way they do not share) knowledge
- **Organizational Process**: The right processes, environments, and systems that enable KM to be implemented in the organization.
- **Management and Leadership:** KM requires competent and experienced leadership at all levels. Here the technical skill and competences are an important part of the portfolio of knowledge manager or worker, but it is effective only if it is used to work with people and their ideas.
- **Technology:** The systems, tools, and technologies that fit the organization's requirements - properly designed and implemented. Knowledge management is not about technology, but the role of Information Technology (IT) is an enabler, a tool which allows for scalability and global scope. Without proper IT is extremely difficult to implement a knowledge management system. Here the technology or tools does not make the knowledge management system work; it can facilitate and enable connections and communications only. We can divide the technology support, and the relevant competences into the two groups:
- Transfer and exchange systems which refers to databases, document repositories, pointers to expertise, document exchange etc;
- Data analysis and performance support which includes data to knowledge conversion system, data and text mining, data warehousing, intranets, extranets, decision support and real time intelligent data analysis etc;

Although a variety of technologies can be used to fulfill the tasks but the technology choices depend on what it is that the organization is trying to achieve, differently in different sections.

3. Data, Information And Knowledge

In order to understand KM, it is important first to know about the meaning and relationship of data, information and knowledge. The nature and the relationship between data, information and knowledge have

been discussed as the cornerstone for understanding KM theory in organizations (Alavi & Leidner, 2001). It has been common practice to take a hierarchical view of the relationship between data, information and knowledge. As per this view the value of data, information and knowledge are not equal in terms of utility and application. These are evaluated in an ascending scale of values. Here data having least value and knowledge is the greatest. Theirauf (1999) defines these three components as: data is the lowest point, an unstructured collection of facts and figures; information is the next level, and it regarded as structured data; finally knowledge is defined as information about information.

- **Data:** Data is unorganized pieces of facts or raw materials or constituents of information which may or may not convey any logical meaning. When data is processed and presented in an organized form and their relationship among data is established than it becomes information. "Data is represented as an item or event out of context with no relation to other things." (Bellinger, 1997).
- **Information:** Information is organized, processed and systematized data which conveys logical and proper understanding about a situation, topic or issue. So, data is collected, systematized and interpreted to generate information. It is the building block of knowledge.

  In a hierarchical view, information is data transformed by value-adding processes of contextualization, categorization, calculation, correction and condensation (Davenport & Prusak, 2000). When data is organized in logical, cohesive format for a specific purpose, it becomes information (Gandhi, 2004).
- **Knowledge:** Knowledge is what that knower knows. It is specific to the knower, created from information, integrated with experience and interpreted in a particular context. Outside it exits as in the form of documents, man-made artifacts, cultural practices etc. It is renewable, reusable and increasing its value with proper use. It may be defined as it is an organized set of statements of fact or an idea, presenting a reasoned judgment or an experimental result, which is transmitted to others through some communication medium in a systematic form. It is closely linked to doing and implies know-how and understanding. The knowledge processed by each individual is a product of his experience and encompasses the norms by which he evaluates new inputs from his surroundings. (Davenport & Cronin 2000).

In order for KM to succeed, one needs a deep understanding of what constitutes knowledge. Now, that we have set clear boundaries between knowledge, information and data, it is possible to go one step further and to look the forms/ type in which knowledge exists and the different ways that it can be accessed, shared and combined.

4. Types of knowledge

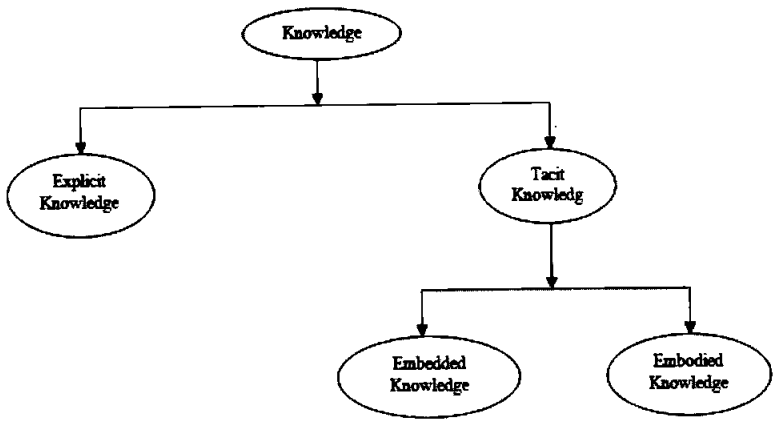
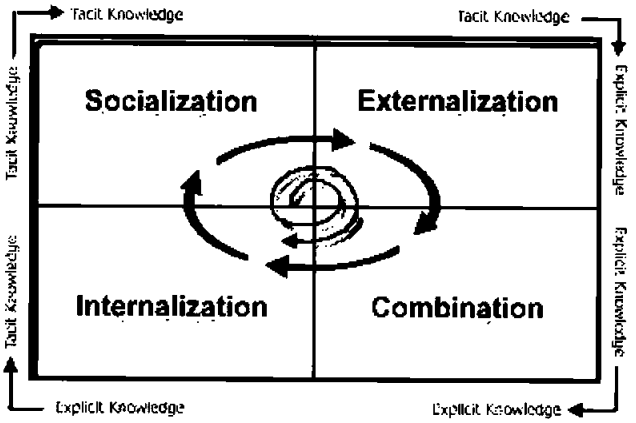


Figure 1 – Types of Knowledge

Two forms of knowledge popularized by Japanese scholars Ikujiro Nonaka and Hirotaka Takeuchi (1995), have dominated discussion on the nature of the knowledge in KM. based on the work of Michel Polanyi (1996) they promoted recognition of the tacit-explicit knowledge classification, that has been widely cited in the literature.

- **Explicit Knowledge:** This knowledge is also called social knowledge or public knowledge. It can express to others orally or in a recorded form. It is tangible in nature and can codify into documents, databases or other tangible forms. This knowledge is easily handled in Knowledge Management System KMS).
- **Tacit Knowledge:** This knowledge is also called personal knowledge or private knowledge. It is highly personalized and subjective. It is intangible in nature and cannot be codified into document or databases. It is based on personal experience, aptitudes, perceptions, insights, and know-how that are implied or indicated but not actually expressed. It is made up of best practices, experience, wisdom and un recordable intellectual property that live within individuals and teams. Tacit knowledge has two forms:
- **Embodied Knowledge:** It cannot not detach from its knower. It is difficult to articulate.
- **Embedded Knowledge**: it is resides in the things created by individuals or teams. Generally it is found in rules, processes, manuals, organizational culture, code of conduct, ethics, products etc. it is important to note that:
- **Knowledge Creation Model (SECI):** In 1995, Ikujiro Nonaka and Hirotaka Takeuchi, in their book The Knowledge Creating Company: How creates the Dynamics of Innovation, presented the following SECI (Socialization, Externalization, Combination and Internalization) Model of how tacit and explicit knowledge interact with knowledge creation process, which has become the cornerstone of knowledge creation and transfer theory. The proposed four ways that knowledge types can be combined and converted, showing how knowledge is shared and created in the organization.



Spiral of Knowledge Creation
by Nonaka & Takeuchi (1995)

Figure: 2

The four types of knowledge transformation are given below:

- Socialization : from tacit knowledge to tacit knowledge
- Externalization : from tacit knowledge to explicit knowledge
- Combination : from explicit knowledge to explicit knowledge
- Internalization : from explicit knowledge to tacit knowledge

Here socialization involves social conversion to share experience from tacit knowledge to tacit knowledge i.e. individual tacit knowledge is conveyed to other by showing and doing. Thus socialization is used in sharing learners' experience and know-how with other learners. Externalization involves the conversion of tacit knowledge to explicit knowledge. This process attempts to rationalize tacit knowledge and articulate it into explicit concepts and formal models. Simply we can say here social knowledge is captured and codified and made explicit. Combination involves converting explicit knowledge into more complex and systematic sets of explicit knowledge. In other word we can say the codified knowledge is combined to create new knowledge.

Internalization is a process of embodying explicit knowledge into tacit knowledge and internalizing the individual experiences gained through the other models of knowledge creation in the form shared mental models. Through internalization, the created explicit knowledge is shared though an online learning community and converted into tacit knowledge by individuals.

In this model knowledge is continuously converted and created as users practice and learn. Both explicit and tacit knowledge are extremely valuable to any enterprise. Therefore, KM focuses on business processes related to both. Since explicit knowledge can be rendered into digital artifacts that can be communicated, stored and retrieved, a superficial view is that KM is only concerned about software automation which facilitates explicit knowledge. Tacit knowledge can, however, be addressed by software in the following ways:

- Pointing to the people who hold knowledge
- Supporting and catalyzing collaborative processes of exchanging knowledge
- Helping convert a portion of tacit knowledge into explicit knowledge.

Tacit knowledge represents an immense asset of value within an organization. There are times that the loss of only a few key people "walking out the door" with their essential knowledge and skills can put at risk the net worth of an entire organization. In the early stage development of an organization, key individuals' tacit knowledge embodies the vision and mission, as well as the core competencies. Their loss can put at risk the viability or survivability of the corporation. One of the thrusts of KM is to protect and enhance these valuable assets by creating infrastructure and a culture of knowledge sharing.

5. Transformation Process: from Data to Knowledge

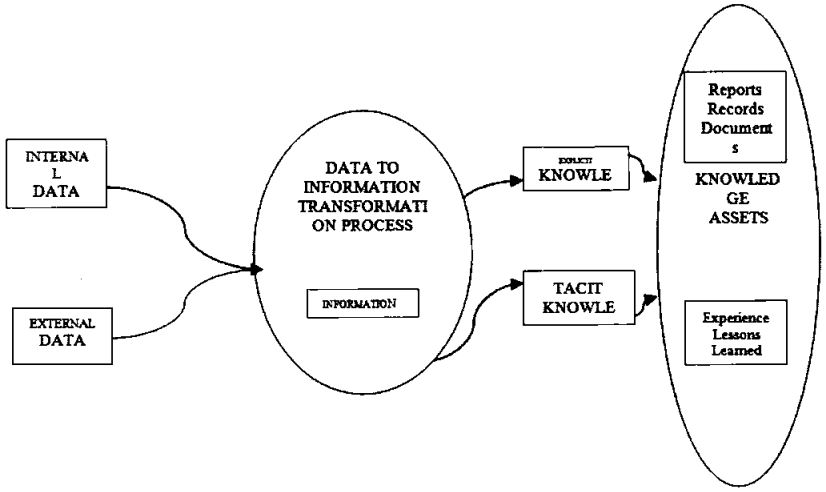


Figure: 3 from data to knowledge

The above figure illustrates the data to information to knowledge process that occurs in every organization. Moving from left to right, data is used to enable and support the tasks and activities of its units,

section or departments. The data can originate inside the organization or be acquired from external sources. Here data is transformed into information which is then filtered, further transformed, reused, stored, or transferred. The process of creating information, the data to information transfer process, is a knowledge creating process that creates both explicit and tacit knowledge. Both explicit and tacit knowledge are required for creating any knowledge management strategy.

6. KM And Academic Libraries

The emerging field of KM offers academic libraries the opportunity to create knowledge to improve organizational effectiveness, both themselves and their institutions. Colleges, Universities and their libraries are social organizational organization where workers transform resources for use by users through the functions of teaching, research and service. Today the higher educational institutions are beginning to adopt the idea of managing their organizational knowledge assets.

Independently, librarians have developed and applied many KM principles in the provision of academic library services. Reference, cataloguing and other library services are designed to encourage the use of scholarly information and thus increase the amount of academic knowledge used in higher education. Questions in a reference interview and the point of access a catalogue both are intended to reinforce the ways that scholars work to create new academic knowledge. However, libraries have done little to use organizational information to create new knowledge that can be improving the function of library and higher education processes. In many ways, KM incorporates principles that academic librarians have developed and used with scholarly information for many years.

In knowledge organization, Prusak (1997) outlines six environmental issues those are forcing organizations to focus on knowledge. These are given below:

- An accelerating world means rapid knowledge decay and the need to create new knowledge more quickly. Knowledge must be managed consciously if the workers are to learn fast enough for on organization to remain competitive.
- Smart products, such as selective dissemination of information services offer knowledge as part of product;
- Globalization is creating distributed systems of production;
- Turn-over is increasing throughout academia. Knowledge that used to be embedded in one person for a career now leaves as individuals change jobs with greater frequency;
- Virtual operations require more embedded knowledge to work effectively;
- Finally knowledge begets knowledge. As system become more knowledgeable and interactive, new opportunities to use new knowledge proactively and generated.

Given these parameters and needs, it is clear that KM has a significant future in academic libraries and in the academic institutions they serve. Through KM, libraries have an opportunity to collaborate with other units to increase both their effectiveness and that of higher education.

KM is one of the ways to develop and apply the organizational knowledge needed to improve library operations and ultimately, library effectiveness. It also enables libraries to generate organizational knowledge for higher education institutions. In the dynamic world of academic libraries, no library will succeed for very long when it is not managing its most valuable resource, its knowledge, as effectively as possible. This part of the article addresses what libraries can do to improve their KM in all of the key areas of library services.

Academic libraries can create knowledge repositories composed of explicit knowledge that has been documented and organized in such a way for easily access. Often these are called data warehouses or data malls. External knowledge repositories also can be used to achieve organizational objectives.

KM process is one that improves access to and transfers of organizational knowledge. This often takes place by creating expert networks where individuals with desired expertise are organized formally into a network and put into contact with others, creating community of interest.

Today most of the academic library has created digital or virtual library to complement and reinforce existing library services and to encourage increased knowledge transfer. The virtual library emphasizes services that are proactive, such as selective dissemination of information and document delivery. In addition, research consultants combine tacit knowledge drawn from working directly on research teams with knowledge of the virtual library to identify and transfer useful research information directly to users.

In the corporate community, special libraries have been involved in KM from its beginnings. In the same way, academic librarians can benefit their institutions, their libraries, and themselves by undertaking a campus wide role in managing organizational knowledge. They can use knowledge management as a way to expand the library's role to areas such as administration or support services, where libraries have had little impact in the past. Moreover, they can develop cross-functional teams with units such as computing, instructional technology, institutional planning, and personnel to create collaborative organizations that have major institutional missions and responsibilities.

Higher education is in the midst of major change as accountability, technology, faculty aging, distance education, and many other pressures come to bear. KM offers an opportunity to manage some of these issues and achieve institutional goals by using organizational knowledge. Libraries can bring specific skills in the selection and organization of knowledge, training, and user support to cross-functional teams. By doing so, they can create increased interest and support for their other missions.

Although these are only beginnings, they give an indication of the ability of KM to expand the role of libraries within the academic institution. The rewards for libraries include enhanced goal attainment, increased visibility and standing within the institution, strengthened partnerships with administrative and service units, and better funding opportunities. The rewards for institutions of higher education include increased goal attainment, increased competitiveness, and more cost-effective knowledge services. For users, KM will mean more knowledge that can be obtained more quickly and that is more closely related to achieving work related goals.

7. Similarities and Differences

In some important ways, knowledge management is merely putting a new name to things that librarians have done for centuries. It is primarily a social, not a technological, technique. The service function and good relations with users, which are the keys to successful librarianship, are central to KM as well. The selection, organization, and weeding of knowledge are necessary prerequisites for the successful operation of both services. Commitment to staff training is an important part of both KM and library services. Library functions will be at the heart of a knowledge-based organization and a knowledge-based organization such as an institution of higher education will insist on effective library and knowledge services.

Moreover, there are differences between knowledge management and the practices of most academic libraries.

- First, KM is almost entirely goal oriented. If the academic goal changes, knowledge management will change rapidly to address the new goal. On the other hand, academic libraries tend to provide services as long as they are used.
- Second, KM tends to be much more proactive in terms of users. It is more willing to initiate a dialogue than libraries have been in the past.
- Third, libraries traditionally try to be everything to everybody, whereas KM tends to be very focused and selective.

- Fourth, KM is committed to the time value of knowledge, a concept unknown in academic libraries until recently.
- Finally, KM is outcomes based, whereas libraries are people based. These differences, though at times profound, need not be overwhelming. As libraries adopt more aspects of the learning organization, and as knowledge management learns more about organizing and supporting knowledge, it is likely that the differences will begin to blur.

8. Conclusion

KM is a new field drawing on several disciplines, including library and information science. Higher education and academic libraries can use KM to achieve organizational goals. It can be incorporated into many library operations to improve effectiveness. In addition, it offers the opportunity to expand the role of libraries in an academic community in order to strengthen relationships with related units inside and outside the university.

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Resource Description and Access (RDA) and Functional Requirements for Bibliographic Records (FRBR): *A General Introduction*

Madan Lal Jat



Resource Description and Access was quickly realized that substantial revision of Anglo American catalogue Rule-2 was required, which encouraged the opinion of a new for what has been envisaged as a third edition of AACR FRBR relates user of retrieval and Access in online library catalogues and bibliographic database. This paper is theoretical and Importance for LIS Professionals, Information Scientists, Research Scholar and Students.



RDA, JSC, AACR2, FRBR, IFLA, Bibliographic and ISBD.

1. Introduction

RDA is a standard for cataloguing that provides instructions and guidelines on formulating data for resource description and discovery, intended for use by libraries and other cultural organizations such as archives and measures, RDA is the successor to the Anglo-American Cataloging Rule-2. The current cataloging standard set for English libraries.

RDA was initially released in June 2010. The library of congress announced in March 2012. It will have fully implemented RDA Cataloging by March 31, 2013. Its have been implements. Several other national libraries including the British library, Library and Archives Canada National library of Australia and Dautsche National bibiothek also planned to implement Resource Prescription and Access (RDA) in 2013.

2. History of RDA

RDA immerged from the International Conference on the Principles & Future Development of AACR held in Toronto in 1997. It was quickly realized that Substantial revision of AACR2 was required, which encouraged the adoption of a new title for what had been envisaged as a third edition of AACR.

RDA is published jointly by the ALA, the Canadian Library Association and the Chartered Institute of Library and Information Professionals (CILIP) in the UK. RDA instructions and guidelines are available through RDA Toolkit, an online subscription site and in a print format.

Maintenance of RDA is the responsibility of the Joint Steering Committee f or the Development of RDA (JSC). The JSC is composed of representatives from the American Library Association, the Australian Committee on Cataloguing. CILIP, Deutsche National bibiothek and the Library of Congress. The primary distinction between RDA and AACR is structural. RDA is organized based on the FRBR. These principles identify both the user tasks which a library catalogue should make perusable and a hierarchy of relationships in bibliographic data. Descriptions produced using the instructions of RDA are intended to be compatible with any coding schema, including the data environments used for existing records created under the AACR2 rules.

3. Opposition of RDA

In the United States, the cataloguing community expressed reservations about the new standard in regard to both the business case for RDA in depressed economy and the value of the standard's stated goals. Michael German, One of the authors of AACR2, was particularly vocal in expression of his opposition the new guidelines, claiming that RDA was poorly written and organized and that the plan for RDA unnecessarily abandoned established Cataloguing practices. In response to these concerns, the three United States national libraries (Library of Congress, National library of Medicine and the National Agricultural Library) organized a nation-wide test of the new standard.

4. U.S. RDA Rest Coordinating Committee Report

On 13 June 2011, the library of Congress, the National Agricultural Library and the Library of Medicine released the results of their testing. The test found that RDA to some degree met most of the goals that the JSC put fourth for the new code and failed to meet a few of those goals. The coordinating committee admitted that they "wrestled with articulating a business case for implementing RDA."

Nevertheless the report recommended that RDA be adopted by the three National libraries, contingent on several improvements being made. The earliest possible date for implementation was given as January 2013. As the consensus emerging from the analysis of the test data showed that while there were discernible benefits to implementing RDA, these benefits would not be realized without further changes to current Cataloging practices, including developing a successor to the MARC format.

5. International Reception

RDA abs developed to be an international standard and is in step with the statement of International Cataloguing Principles published by IFLA in 2009. RDA is also in step with established international display and encoding standards. The emergence of the European RDA Interest Group (EURIG) and the addition of the Deutsche National bibiothek as a member of the JSC signaled interest in RDA beyond the English Speaking library community.

6. RDA Vocabularies

The first sets of RDA Vocabularies were published on the open Metadata Registry in August 2011. The creation and publication of stable forms of RDA elements and controlled Vocabularies/Concepts makes RDA elements and controlled Vocabularies/Concepts makes RDA-created data accessible as open linked data for builders of applications. Alan Danskin, Chair of the Joint Streeting Committee in 2011, noted, "The RDA Vocabularies are a fundamental component of RDA, prompting consistent description and discovery of bibliographic resources. The committee is committed to publishing and maintaining the content of the RDA Vocabularies, synchronized with the text of RDA, in order to support their use by the resource description community and by developers of semantic web applications."

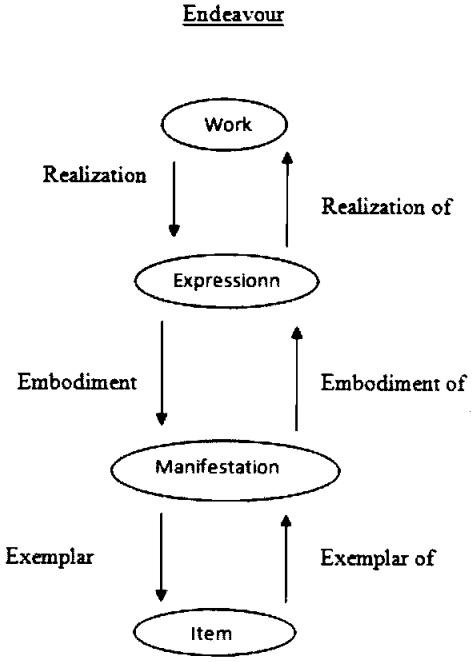
7. Functional Requirements for Bibliographic Records

Introduction:-FRBR is a conceptual entity relationship model developed by IFLA that related for user tasks of retrieval and access in online library catalogues and bibliographic databases from a user's perspective. It presents a more holistic approach to retrieval and access as the relationship between the entities provides links to navigate through the hierarchy of relationships. The model is significant because it is separate from specific cataloguing standards such as AACR2 or ISBD.

- **FRBR Entities:**
- **FRBR Group Entities are steps:-**
- Group one entities and basic relations (RDF versions)
- Group two entities and relations.
- FRBR comprises groups of entities: Group one entities are work, expression; manifestation and item (WEMI).They represent the products of intellectual or artistic endeavor.
- Group two entities are person, family and corporate body, responsible for the custodianship of Group ones intellectual or artistic endeavor.
- Group three entities are subjects of Groups one or two's intellectual endeavor and include concepts, objects, events, places.

8. Group/Entities are the foundation of FDBR Model:

- **Work:** is a distinct intellectual or artistic creation. For example, Beethoven's Ninth Symphony apart from all ways of expressing it is a work, when we say, "Bethoven's Ninth is magnificent!" We generally are referring to the work.
- **Expression**: Expression is "the specific intellectual or artistic from that a work takes each time it is realized." An expression of Beethoven's Ninth might be each draft of the musical score he writes down (not the paper itself, but the music therapy expressed).
- **Manifestation:** Manifestation is "the physical embodiment of an expression of a work. As an entity, manifestation represents all the physical objects that bear the same characteristics, in respect to both intellectual content and physical form." The performance the London Philharmonic made of the Ninth in 1996 is a manifestation. It was a physical embodiment even if not recorded, through of course manifestation are most frequently of interest when they expressed in a persistent from such as a recording or printing. When we say, "The recording of the London Philharmonics 1996 performance captured the essence of the Ninth." We are generally referring to a manifestation.
- **Item:** Item is "a single example or a manifestation. The entity defined as item is a concrete entity." Each copy of the 1996 pressings of that 1996 recording is an item. When we say, "Both copies of the London Philharmonic's 1996 performance of the Ninth are checked out of my local library." We are generally referring to items.



Part : Part of related Endeavour

Diagram: Group entities and basic relations

(RDF version)

Diagram: Two Entities and Relations

- **Relationships:** - FDBR is built upon relationships between and among entities. "Relationships serve as the vehicle for depicting the link between one entity and another and thus as the means of assisting the user to 'navigate' the universe that is represented in a bibliography, Catalogue or bibliographic database." Examples of relationship types include, but are not limited to.

- **Equivalence relationships:** Equivalence relationships exist between exact copies of the same manifestation of a work or between an original item and reproductions of it, so long as the intellectual content and authorship are preserved. Examples include reproductions such as copies, issues, facsimiles and reprints, photocopies and microfilms.
- **Derivate relationships:** Derivate relationships exist between a bibliographic work and a modification based on the work.

Summary:

RDA and FRBR represents a more holistic approach to retrieval and access as the relationships between the group entities is second and third, or provide links to navigate through the hierarchy of relationships.

The model is significant because it is separate from specific cataloguing standards such as AACR2 or International standard Bibliographic Description. RDA and FRBR emerging standard based on: AACR2 and ISBD.

Examples include:

- Editions, versions, translations, summaries, abstracts and digest
- Adaptations that become new works but are based on old works
- Genre changes
- New works based on the style or thematic content of the work.
- Descriptive relations: - Descriptive relationships exist between a bibliographic entity and a description, criticism, evaluation or review of the entity, such as between a work and a book review describing it. Descriptive relationships also include annotated editions, casebooks, commentaries and critiques of an existing between entities of relationships.

> "Classification, broadly defined, is the act of organizing the universe of knowledge into some systematic order. It has been considered the most fundamental activity of the human mind."
>
> **— Lois Mai Chan**

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The Heart of Knowledge:
Shifting Paradigms in the Knowledge Management in Non-Profit Organizations

Dinesh Rathi **Lisa Given** **Eric Forcier**

At the intersection of Knowledge Management (KM) and Web 2.0 lies a deep well for scholarly inquiry, with insights essentially valuable not just for libraries in India and worldwide, but for all Non-Profit Organizations (NPOs). The ever-increasing ubiquity of social media tools and technologies (e.g., blogs, wikis, and social networking sites) represent a fundamental shift in the knowledge ecology; this paradigm shift is noteworthy in part because of how it transforms our understanding and application of KM. The study has focused on the use of social media as tools for knowledge management in non-profit organisations (NPOs), including public libraries in both urban and rural communities. Through qualitative interviews with managers and staff members in NPOs operating in western region of Canada, as well as an ongoing pan-Canadian survey of NPOs, the current research has undertaken founding work on the current adoption and use of social media tools in creating, assimilating and disseminating organisational knowledge of primary importance to these organisations. Among findings is the particular collaborative and generative value of these tools noted by participants, especially social networking sites like Facebook and Twitter, in capturing community-generated knowledge, as well as the benefits and challenges of embedding these tools into pre-existing organisational and KM practices. These findings including some insight into the results from libraries as examples and more will be the focus of discussion at the Indian Library Association International Conference.

Knowledge Management. Non profit organizations, Social Networking media

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Major Tools of Knowledge Management: *An Overview*

Pankaj Kumar Singh



Knowledge Management wrists in recognizing, generating documenting, distributing and transferring of explicit and tacit knowledge between people in order to enhance the efficiency of organizations. Knowledge management includes cultivating a system for the collection and maintenance of data, information and experience. So that there may be a smooth and easy communication and interaction may be facilitated, for this to happen, tools and methods of knowledge management will not be successful in its objective.



Knowledge Management. Keywords: Knowledge Management (IM), KM tools

1. Introduction

In the present age of modern technology knowledge management has become a very easy task. Today knowledge can be captured and shared in no time by using such tools as search engines, meta & web crawler, data and text mining, taxonomy and ontological tools, Internet and Internet tools and portals etc. These tools facilitate developing a system for collecting and maintaining data, information, experiences and lessons as well as establishing a healthy and advantageous social interaction among the people of society. This paper aims to study the various tools that facilitate knowledge management and help people obtain and spread knowledge for the benefit and betterment of mankind .

Knowledge management emphasizes technology- the capture, storage and transfer of codified information such as statistics, presentations and reports using an internet or other type of computer network or the technology. This emphasis on technology misses a key ingredient of knowledge management- facilitating workplace learning and generating knowledge. However, the three dominant streams of research into knowledge Management can be identified on the basis of knowledge management research.

The first stream focuses primarily on research into the theory of knowledge, the knowledge of the firm, organizational culture, measurement of intellectual capital and learning organizations.

The Second stream is represented by the work on corporate memories (aka organizational memories and organizational memories and organizational memory information (OMIS)) for enhanced decision making. A corporate memory embraces all forms of institutional knowledge, whether formally encoded within the current information systems, or tacit (informal) knowledge used by individuals in professional practice.

The third stream, with a strong contribution from computer scientists and artificial intelligence (AI) researchers in particular, tackles the areas of intelligent agents, ontologies or taxonomies, data mining, knowledge modeling and computer-mediated collaborations.

2. Categorization of KM Tools:

Most of the commercial knowledge management of KM supports one or both of the above approaches. In order to better understand the origin and the characteristics of these software, it is necessary to reflect upon the major KM research streams stated above. All the research streams in KM, especially the third have spawned the development of tools for supporting various knowledge processes (e.g., capturing, encoding, organizing, searching, distributing and measuring) at the individual level and virtual collaborations at the group and organizational levels. In a wider sense, the objectives of developing and deploying a KMS are:

- Capture, create and share knowledge assets
- Locate relevant information knowledge

- Provide an environment for knowledge exchange
- Connect people with relevant interest and/ or skills
- Facilitate and/or support intelligent problem solving (e.g., decision making)

3. Intelligence

The computational part of the ability to achieve goals in the world is intelligence. It involves mechanisms and Artificial intelligence research that discover how to make computer carry out some of them. If doing a task requires only mechanisms that are well understood today, computer programs can give very impressive performances on these tasks.

4. Applications of Artificial Intelligence:

Artificial Intelligence programmes are applied in many fields. They are:

- Game playing
- Speech Recognition
- Understanding Natural Language
- Computer Vision
- Expert Systems etc.

- **Game Playing:** One can buy machines that can play master level chess for a few hundred dollars. There is some AI in them, but they play well against people mainly through brute force computation-looking at hundreds of thousands of positions.
- **Speech Recognition:** In the 1990s, computer speech recognition reached a practical level for limited purposes. Thus United Airlines has replaced its keyboard tree for flight information by a system using speech recognition of flight numbers and city names.
- **Understanding Natural Language**: Just getting a sequence of words into a computer is not enough. Parsing sentences is not enough either. The computer has to be provided with an understanding of the domain the text is about, and this is presently possible only for very limited domains.
- **Computer Vision**: The world is composed of three-dimensional objects, but the inputs to the human eye and computer's TV cameras are two dimensional. Some useful programs can work solely in two dimensions, but full computer vision requires partial three dimensional information that is not just a set of two-dimensional views.
- **Experts system**: A knowledge engineer' interviews experts in a certain domain and tries to embody their knowledge in a computer program for carrying out some task.

5. Tools

The following tool categorizations are increasingly becoming evident in the market focusing on the origin, alignment with business processes, and capabilities of commercial K M software.

- **Search Engines-**In the present electronic and Internet age, search engines have occupied a very important place due to their hole in exchanging and spreading information are very important. This information explosion is due to two major influences. First, the general availability of inter-networked databases and information repositories has expanded user's access to information. Second, the rapid acceptance of network access as a standard business and home tool is energizing organizations to add information to online databases.
- **Meta/Web Crawler-**Web crawlers are very important tools that make intelligent searching by extensively using meta data and indexing make easy. Data are not limited to texts and numerals, but often involve multimedia formats (i.e., voice, graphics, video, etc.) A common feature of Web crawlers is the ability to place "hooks" on targeted locations on Web, detect changes in the content, and notify

the user of applications, such tools are especially suited for performing research on the Web and the gathering of market and competitive intelligence.

- **Process Modeling And Mind Mapping**-Process modeling and mind mapping offer a visual environment for ideas to be such offer a received and exchanged received communicated both at the individual and group levels. Some of the advanced tools also allow business processes to be defined and modeled. Such tools greatly enhance the conceptualization of procedural and declarative knowledge. However, up to now nearly all the tools in this category are stand-alone products rather than "plug-in" to other existing information/communication systems.

- **Case-Based Reasoning (CBR)**-Case –based reasoning (CBR) makes it possible for the past cases to be reused in unseen and new situations makes it possible for the many CBR systems have been developed for help desk (e.g., call centre) and software development application. In the product development area, organizations are, packaging their "case bases" (which contain product development and product support knowledge) when new products/ services are launched. In some cases, these "case-bases" (a form of "organizational experience") are connected in a self-help systems that is bundled into a new product.

- **Data And Text Mining**-Data and text mining are another tools of this category which are helpful in enabling meaningful patterns and associations of data words and phrases to be identified from one or more large databases. It has been around for more than a decade. They form part of a KM solution as many developers and researchers consider data and text mining to be a type of "micro" knowledge strategies (as opposed to Knowledge Program Management as a suite of "macro" knowledge strategies) for an organization. Data and text mining systems are being used largely in business intelligence, direct marketing and customer relationship management applications.

- **Taxonomy Ontological Tools**-A taxonomy, to put it in simple words is a collection of terms/ keywords commonly used in an organization or industry. More often then not, the relationship (s) between these terms are also captured. Examples of a relationship are 'hierarchical' – where one term is more general hence includes another term; 'functional' where one term is more general based on their functional capabilities, and 'networked'- where they are multiple links between the terms defined in the taxonomy. An ontology can be a far more elaborate framework than a taxonomy. In addition to the definition and linkages between terms (concepts), an ontology also supports deep (refined) representation of each of the concepts as well as defined domain theory or theories that govern the permissible operations with the concepts in the ontology.

- **Messurement And Reporting**-Measurement of Intellectual Capital (IC) is an important strategy taken up by organization as a tools of KM for these organizations, KM is tackled from a strong human resources focus and criteria are defined to quantify the value of human capital, intellectual assets, and the Return-On-Investment (ROI) for KM-related projects/investments. Established methods include, but are not limited to, monitoring the growth in infrastructural assets (e.g., best practices, process knowledge), tracking the flow and speed of an idea from conception to becoming an intellectual property and surveying "grass- roots" support of the corporate KM environment (e.g., personal adoptions of knowledge communities, portals). Tools are now available to measure, track and report on the value of intellectual capital (i.e., non-financial assets) in an organization.

- **Internet and Intranet Tools**-Internet and Intranet are very important tools of information technology infrastructure which may in corporate distance learning, Web-based learning, e-libraries and simulations, These technologically based forms of knowledge management can be highly effective in communicating embedded knowledge, through many types of interactive sessions, to other employees. Also, the structured environment provided by Internet-or Intranet-based knowledge management technology helps employees to coordinate their activities.

  Science intranets and the Internet are getting more popular in organizations, Web-based Training and E-Learning are increasingly being used for sharing and transferring knowledge. Web-based training refers to instructional programs that use the attributes and resources of the World Wide

Web to create a learning environment. All instruction is delivered over the Web-trainers may be electronically linked to the students to serve as resource persons but thy do not deliver instruction.

- **Portals**-The portals provide for people spots to get relevant information and links to many other sources of information. Their central benefit is the organization and structured presentation of information from a variety of sources. Portals act as a single point of access to information. There are different types of information, such as - validated archival content (policies, form); current awareness (news, announcements); open source; content (yellow pages); external links; and group messaging (email, chat rooms, Communities of Practice). Each of these information types can also be in unstructured text and multimedia files, or in structured databases. In addition, portals can cover a broad set of topics, such as for a general corporate Intranet, or a specific job function, such as Human Resources.

6. Conclusion

In conclusion, it can safely be argued that in the present scenario the tools like search engines, meta/web crawler case based reasoning, data and text mining, Taxonomy/ ontological tools, Internet and Intranet tools and portals one very essential and indispensable for knowledge management and its success in its objective. These tools enhance the efficiency of the people associated with knowledge management and also equip the organizations with every facility that is necessary for the dissemination of knowledge and information between persons. Thus, the importance of these tools of KM is established.

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E-Granthalaya - Pre & Post Automation problems faced by the Users of ITM University, Gwalior: *A Study*

Pawan Kumar Sharma **Hemant Sharma**

Abstract

The present study examines the use of e-Granthalaya software and pre & post automation problems faced by the library staff and users of ITM University, Gwalior. A well structured questionnaire was designed to know the opinions from the Staff /users of e-Granthalaya. 100 questionnaires were distributed among the students and research scholar out of which, 75 were received back duly filled in. The results of the survey provide useful information about the awareness of e-Granthalaya, purpose of using e-Granthalaya, satisfaction level of students and research scholars with available library management software in the library. On the basis of the results of the survey some suggestions have been forward for effective use of automated environment.

E-Granthalaya, ITM University, Gwalior

1. Introduction

E-Granthalaya is library automation software from National Informatics Centre, Government of India. The software has been designed by a team of experts from software as well as Library and Information Science discipline. Using this software the libraries can automate in-house activities as well as user services. The software can be implemented either in stand-alone or in client-server mode where database and WebOPAC are installed on the server PC while the data entry program is installed on client PCs. The software runs on Windows platform Only, UNICODE Compliant, thus, supports data entry in local language.

2. Genesis of E-Granthalaya

E-Granthalaya was started as an in-house project at 'Karnataka State Centre of NIC, Bangalore' and first version of the software was designed for the Public Libraries in the State. Later, NIC HQs 'Library and Information Services Division' took over the designing of the software where library professionals were involved in the designing process and, thus, improved the software with enhanced user interface and simplify the work-flow of library functions so that it can suit all kinds of libraries.

Table: 1 shows the release of various versions of e-Granthalaya

Technology/Platform used	Version	Year	Database Management System
Visual Basic 6/ASP/HTML	1.0	2003	MS SQL Server 7
Visual Basic 6/ASP/HTML	2.0	2005	MS SQL Server 2000
VB.NET/ASP.NET 2.0	3.0	2007	MS SQL Server 2005
ASP.NET 4.0/AJAX/ SilverLight (Hosted in NIC Server in Cloud Computing Environment) (*Under Development)	4.0	2013	MS SQL Server 2008R2/PostGresSQL

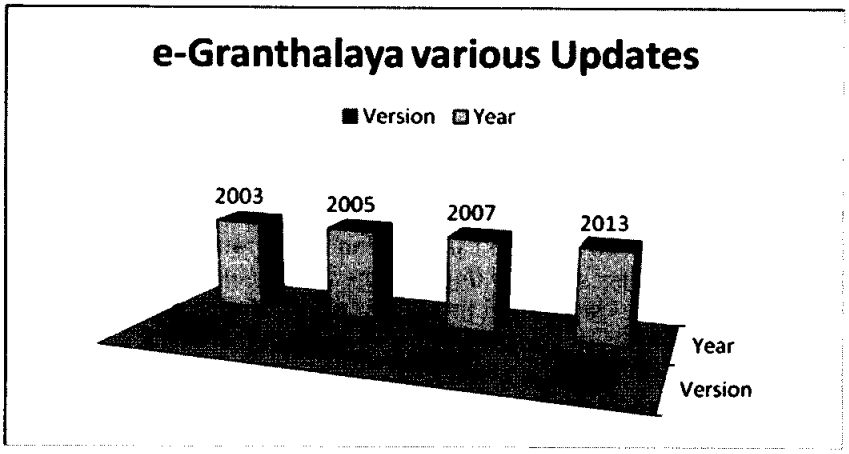


Figure-1: Various version of e-Granthalaya Software

3. Development in ITM University Library System

ITM University was established in 2011, is a multidisciplinary university known for its quality of research and teaching across the academic spectrum, with subjects spanning the sciences, engineering, management, fine arts, social sciences, arts, nursing etc. "ITM University-Gwalior", is sponsored by Samata Lok Sansthan, a registered charitable Trust.

ITM University has one of the largest library space in the state. University has been continuously enriching & updating library resource center in both way (print as well as online) with more than 58,406 textbooks and more than 11,921 reference books and 2751 CDs & DVDs on relevant subjects such as Management, Computer Science, Information Technology, Electronics & Telecommunication, Electronics & Instrumentation, Mechanical, Civil, VLSI, Humanities, Education, Biotechnology, Agriculture etc.

It includes CD-ROM databases, Video Lectures, CD's & DVDs. It subscribes to 13000 journals (200 Indian Journals and 12800 International E-journals through various publishers i.e. IEEE, EBSCO, J-Gate, ASCE, Springer, Gale, Sciencedirect etc).

The organization library is computerized with the support of E-Granthalaya software packages. Circulation, Newspaper Clipping, OPAC and Cataloguing Modules of Software was fully implemented in the library and all the students, teachers transition is done by bar-coded system. An exclusive online facility with Wi-Fi connectivity has been generated to facilitate students and faculty pursuing their higher studies at M.Tech & Ph.D level.

4. Objectives

The survey has been undertaken with the following objectives

- To know the extent of the use of automated library.
- To know the pre & post automation problems faced by the users as well as organization.
- To find out the problems faced by the users & staff while using automated library.
- To ascertain the purpose/s for which automation is done.
- To suggest ways and means for the effective use of automated library.

5. Review Of Literature

Kushawah, Gautam & Singh (2008) describes the observations and makes comparisons on the basis of discussion had with the library community using automation software in India. It also includes the information available in related literature. Features of library automation software, which are mostly in practice by libraries i.e. Libsys and SOUL, are compared with open source system KOHA. **Sangeeta & Sarika (2008)** highlights the present status of academic libraries of Manipur particularly of college libraries of valley areas on varied aspects like-ICT based services, automation status and others including problem in ICT application. It also disclosed some suggestions to improve the service conditions of the college libraries. **Rao (2009)** studied on library automation facilitation in NIT libraries in India. He found that automation makes the library system, resources, and services more attractive and interactive, helping libraries to meet their users' expectations. In order to see the true picture of the provision of automation facilities among NIT libraries, this study has been conducted. There certainly was hopeful news provided by libraries have acquired ILS, and the majority of the libraries have automated their libraries is still in the developmental stages due to various technical, professional, and administrative reasons. Despite this, the NIT libraries will continue to manage their library systems, functions, and services both manually and electronically with limited resource facilities as they always. **Rajput & Gautam (2010)** Carried out to know the status of library automation and problems in their implementation in special libraries of Indore city, Madhya Pradesh. The study explained the various problems faced by authorities and the staff during the process of automation. The tool adopted to conduct the study is a well structured questionnaire. The staff hesitancy and lack of attitude towards automation and unsatisfactory library software problems are the major hindrances to speedy automation. It finally highlights the key suggestions for better implementation of library automation and to overcome the hurdles faced during pre and post automation. **Wodeyar & Hadagali (2011)** attempt has been in this study to know about the status of ICT infrastructure in the engineering college libraries in the Hyderabad-Karnataka region. Some measures have also been suggested for the improvement of existing ICT based resources and services.

6. Scope and Limitations of the Study

The study was about the pre & post automation problems faced by the users of ITM University, Gwalior. The implementation of the system will reduce the time and effort of the users in terms of adding, editing, searching, deleting and printing of records. The system can also help in reducing the expenses of the library such as papers, folders, pens and other materials needed in their current system. The system is LAN-based that enables me to share the records of the student such as the borrowing books, returning books, search books, and prescriptions of the librarian. The student's personal information/data may be stored upon the request of authorized librarian. The assigned librarians are the only one who can share any of the records/data of the students.

7. Analysis and Interpretation of Data

In past years problems of computer - based library systems have arisen from poor communication between librarians and computer professionals. The attitudes of the library staff and library users can also be potential problems. Staff may be afraid of losing their job with the installation of computer based system.

In Library case, automation problems can be categorised into two major classes:

- Pre automation problems
- Post automation problems
- **Pre Automation Problems:** In any Institutional library, there are so many problems and hidden hurdles being associated before automation process and activities. These problems may be in the form of administrative, financial resources, trained library professionals, organisation resources, etc. Some of these problems included to highlight their condition under present study.

In response to questionnaire regarding pre-automation problems, where level of problems are discussed in terms of low, average and high, data received by staff & users are analysed and classified into table-2 and in figure-2 & 3.

Table -2: Pre-Automation Problems of Users (Software V/s User friendly)

S. NO	Problems	Low	Average	High
1	Lack of computer trained personnel	46	25	4
2	Hesitancy / Lack of attitude toward learning computer	20	37	18
3	Fear of losing employment concern to Staff	25	9	41
4	Lack of Administrative support	45	28	2
5	Lack of Space	35	25	15
6	User population willingness	38	26	11
7	Unfamiliarity with IT	33	11	31
8	Training Program	10	35	30

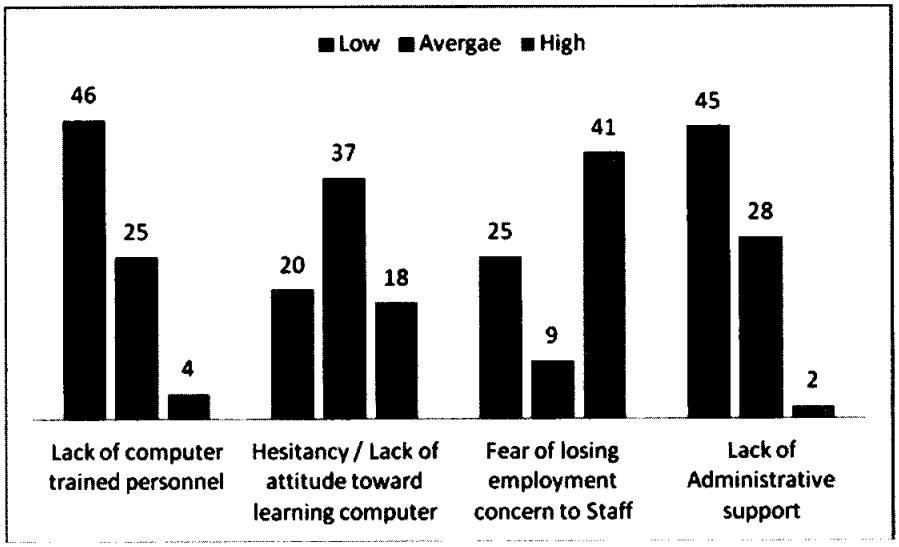


Figure-2: Pre-Automation Problems of Users (Software V/s User friendly)

In response to 'non-availability of computer-trained personnel' majority of users expressing low level problems. In response to 'hesitancy /lack of attitude of existing staff toward learning computer' user expressed it as average level problem, Trend of data indicates that the existing library personnel are tending to learn computer and try to work within the automated atmosphere.

In response to 'fear of losing employment' majority of users & Staff expressing it is high level problem. In response to 'lack of administrative support' Problem university staff express it as low level problem.

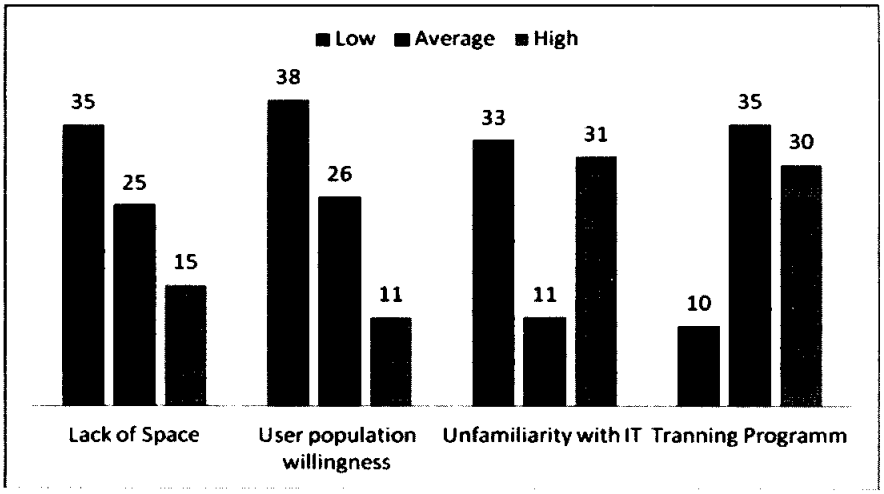


Figure-3: Pre-Automation Problems of Users (Software V/s User friendly)

In response to 'lack of space' majority of users indicate it as low level problem. In response to 'user population' who do not want the library should be automated (based on any survey conducted), users 75 out of 38 users experienced low significance problem.

In response to 'unfamiliarity with IT tools' problems, majority of library staff indicate as average level problem. In response to "training program" majority of users indicate it as average level problem

In brief, as above trend of data indicates that pre-automation problems are of lower significance experienced by majority of users.. The library staff and users are willing to automated library and enjoyed to join the environment. Computer literacy among staff & users as accelerate with coming pace of time interval, they will be familiar with this environment and working knowledge slowly & steadily.

- **Post-Automation Problems:** In post automation problems; users expectation toward computerisation, expectation of organisation, problems faced by in-house staff, lack of user awareness, lack of standardization & incompatibility with hardware, staff cost Vs computerisation, use of collection ability, staff health problem and software Vs user friendly are considered as focal issues to discuss the facts revealed by data presented by Table 3 and also from Figure 4 & 5. Significance of problems are experienced by library professionals represented in three levels i.e. low, average and high in above tables.

Table 3: Post Automation Problems (Software V/s User friendly)

S.No.	Problems	Low	Average	High
1	User expectation toward computerisation	9	11	55
2	Expectation of Organisation	11	14	50
3	Serious problems faced by the in-house Staff.	50	14	11
4	Lack of User Awareness	45	13	17
5	Retrieval Time Factor.	55	5	15
6	Lack of Standardization & incompatibility with Hardware	57	10	8
7	Staff Cost Vs Computerization	57	10	8
8	Collection use & Computerisation	10	11	54
9	Staff Health Problem.	58	9	8
10	Software is not user friendly	55	15	5

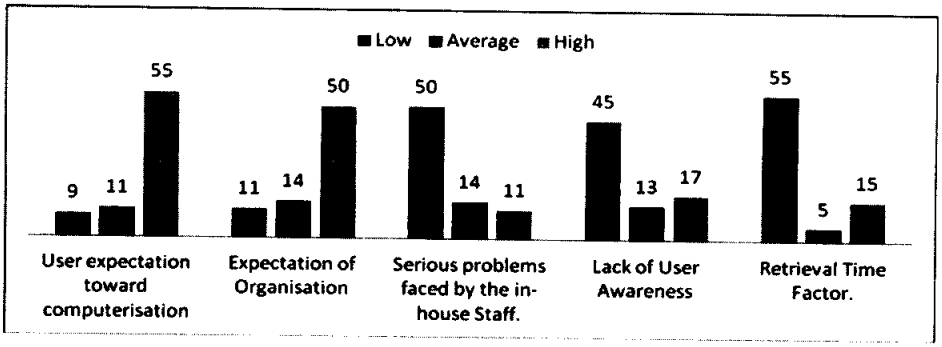


Figure-4: Post Automation Problems (Software V/s User friendly)

In response to "user expectation toward computerization" majority of user indicate it as high level problem. In case of "expectation of organization" problem majority of users shows it as high level of problem. Concern to "serious problems faced by the in-house staff," user feel low level of problems. In response to "retrieval time factor" majority of users shows it as low level problem due to the arrival of latest gizmos/ gadgets.

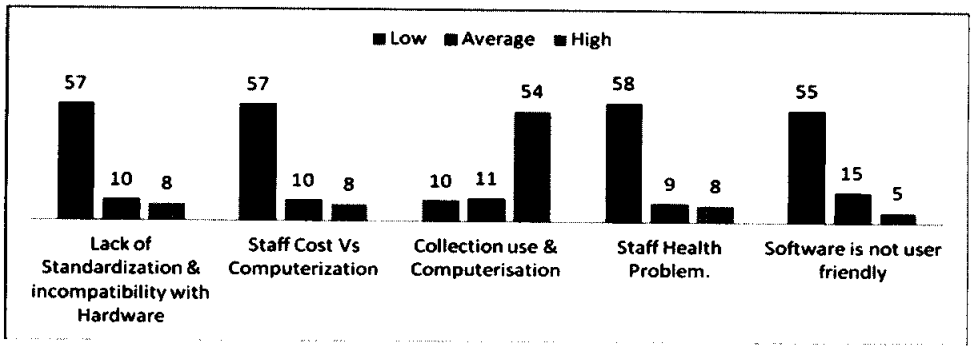


Figure-5 : Post Automation Problems (Software V/s User friendly)

In case of "lack of standardization & in compatibility" through questionnaire revealed that Low level problems due to the use of latest gadgets. Concern to "staff cost Vs computerisation" majority of users shows it as low level problem. Problem about computerization was not able to increase use of collection "realise by majority users as a low significance.

In connection with health problems among staff" users data received through questionnaire indicated that majority of user experienced it at low level significance. Software is not user-friendly, problem indicated that maximum users feel it low level significance of problems.

8. Finding of the Survey

The findings of the study can be summarized as follows:

- Almost all the users of University well versed with the latest technology and help library staff in automating their library..
- Resource sharing concept should be adopted by all the libraries to utilize each and every part of available information for the economy of University.
- It has been found that institutional repositories are not developed in the university library, it is therefore suggested to develop institutional repositories to preserve the information for the future generation.

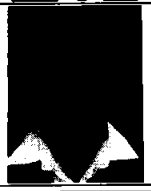
- Users of library were fully satisfied with the circulation services of Library.
- For effective collection use, book of the week and latest arrival mailing facility was already started earlier.
- Grey literature should be collected and properly organized by the libraries for the sake of their organizations and users.
- Parent organizations should encourage their library staff to attend in-service training programs, seminars, refresher courses, workshops etc. to keep them update with the latest development in their own fields.
- Due to the tremendous growth and development in information technology tools and techniques, no one can be easily acquainted with all the latest platforms and technologies. Hence computer literacy must be provided by the libraries to their users.

9. Conclusion

In the age of Information Highway, the traditional concept of acquiring information is gradually replaced by accessing information online or offline in bibliographical form. In this context the students for their academic pursuits mostly demand the bibliographic references and pin pointed information. Thus the use pattern of this category of users should be improved. Accordingly library staff should also take necessary steps for developing such facilities so that the use of automated library can be made to its fullest extent. Consortium/ resource sharing has really proved a great boon for boosting up research activities in the technical colleges and universities. The UGC, AICTE and state governments should come forward to provide financial assistance (some fund should also be available to private colleges and universities) to strengthen the infrastructure for providing effective access to books, journals e-journals, e-books, newswires etc.

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Implementation of "Koha" at IISER Mohali: *an Innovative Experience*

Visakhi, P



This paper aims to explain the circumstances, methods and outcomes of Indian Institutes of Science Education and Research (IISERs) Mohali library in implementing "Koha" in its newly established Institute. The IISER Mohali library installed, tested, and configured "Koha 3.0" to match with its existing policies and procedures. Since the IISER Mohali would like to enhance its features and facilities, identified the areas of improvement for Koha which were not available in existing version. The IISER Mohali library installed new version of "Koha 3.06.04.000 " and implemented its enhanced features with customization as per requirement in phased manner. This paper also discussed the problems faced by library during migration, lessons learned while implementation and future plans of their library by using "Koha"



IISERs ; IISER Mohali ; Library automation ;" Koha 3.06.04.000

1. Introduction

Information access is an area of research spanning over Informatics, Information Science, Computer Language, Information Technology, Computer Science and Library Science. Timely access to right information has become more and more vital in every sphere of life. Quick access to right information has become absolutely essential and crucial to optimize the education and research output. Therefore, the demand for fast access to right, authentic and credible information sources has become important and indispensable for any institution.

In the era of Library 2.0 and 3.0, the paradigm of library services has become more user interactive and user driven. Maintaining a traditional form of library with hard copies of catalogues is becoming more difficult and outdated. Apart from being labour-intensive, it does not have enough appeal to attract users. Now days no library can work in isolation and also cannot survive without taking advantage of sweeping changes taking place all around us. The Online Union catalogue, digital repository and digital libraries are the new paradigms which have been taken up under ICT initiative to facilitate researchers, teachers, students and extension professionals. The services of libraries were static and one sided (non-interactive), but now services have been changed fundamentally over the past couple of decades into dynamic, interactive and virtual. The services being provided by computerized libraries are much timelier, active and accurate that brings improvements in research performance and effectiveness. New resources, services and technologies continue to emerge and creates new opportunities, new challenges for the library professionals and new expectations by users.

As per fifth law of Library Science, the library is an ever growing organism. Maintaining ever growing organism in ancient methods is no longer effective. A properly computerized library will help its users with quick , timely and prompt services. Library automation refers to the use of computer and networking technologies in the library. The most commonly known places of automation in library are housekeeping operations such as acquisition , serials control, cataloguing, classification, circulation , Reporting and Online-Public Access Catalogue etc.,.

This paper aims to explain the circumstances, methods and outcomes of automation of Indian Institute of Science Education and Research Mohali's (IISER Mohali) library and also to describe various challenges faced by library in implementing Library Management software. During 2010 our institute was just three years old when our library initiated to computerize basic services of library. There were many Open Source , free and Commercial Library Management software were available around the globe. However since our Institute was very new and yet to establish completely, the authorities have decided to test with Open source

Softwares available with nature of flexibility for customization, Virus free, Secure, release of frequent updates etc. So our Institute has opted to go "Linux based " Operating systems, Open office , Open Sources LMS, Open Source software for Repository , Open Sources e-learning Platform like "Moodle" etc.,
After evaluating features, functionalities, having consultations and feedback from various librarians who implemented Open sources LMS , we decided to implement "Koha" in our library.

"Koha" is a Māori word (not an acronym for anything) for "gift," but not just any gift, it's a gift with expectations.7 It is really a "GIFT" to the library community. With "Koha" the expectation is that you will contribute back to the project in some way. With open source software people often think that the only way to contribute is to write code, this is not true. By simply using the product, reporting problems and suggesting improvements you're contributing. What makes open source software so much better than proprietary software is the back and forth that takes place between those using the software and those writing it. With "Koha" the developers are very open to suggestions from those using the ILS and always use these suggestions as the building blocks for the next release.

2. Attractive side of Koha

Following are the key features which attracted our library to select "Koha" as our first priority :

- Full-featured ILS
- Ensures interoperability
- Library standards compliant
- Supports MARC21 and UNIMARC bibliographic framework
- Z39.50 Protocol complaint to import / export the bibliographical records
- Customization of circulation
- Generation of e-mail reminders as well as SMS as per our policies
- Creation of patron privileges as per our library policies
- Generation of "Fine Structure' on various slabs
- Web based interfaces
- Free software (Licensed under GNU General Public License)
- No vendor lock in
- Active development process
- Community decides what they want
- Frequent software releases
- Integration with "Google" book covers images
- Integration of " Google Preview" with titles
- Writing of review on a " Book"
- Creation of "My Library"
- Virtual shelving
- Customization of "OPAC" page as per our requirements
- Customization of barcode and spine Labels
- Not only standard format but customized reports generation
- RFID enabled
- Inbuilt SIP2 server
- Biometrics and access controlled enabled

- Generation of patron cards as per our design
- User friendly search tools
- Refining search results by using many friendly factors
- Clouds tags by readers
- Subject tags by readers
- Carting of search results
- Making the search results, public and private
- Displaying of search results most popular to least and vis-vis
- Cataloguing and indexing of e-resources like linking e-books through OPAC with URLs
- Separation of record information from item information to hide library local information
- from public
- Saving of bibliographical record in various format like " MODS (XML), Dublin Core (XML) MARC XML, MARC (non Unicode /MARC8), MARC (Unicode /UTF-8), MARC(Unicode /UTF-8 Standard)
- Bibliographical information can be seen "Normal " "ISBD" and MARC" format and many
- More features are attractive.
- Latest technology like FRBR is also supported
- OPAC (Online Public Access Catalogue) : 'The Face' of the library, this where users see
- Not only the collection but how the collection is managed. International standards like MARC21, FRBR, ISBD, etc, is more visible on OPAC. User's preference of display is monitored by these standards.

  Features like Tagging, Comments suggesting resources to the libraries, help the users to play active role in the development of the collection. Most importantly users are able to see their library account to check the status of books, reading and search history, etc.

- **Future Upgrades :** "Koha" up gradation compare to many other product is much faster and much of the bugs are resolved very fast by the Koha Community. LinkedIn, Face book along with existing Google books / Amazon book cover, etc will bring library to social network.

Integration with any third party discovery tools like Solr, VuFind, will give robust and faster earch engine. Fully compatible with any RFID as SIP2 is default feature. Any RFID hardware can be configured with "Koha" without the support of vendor, provided RFID hardware support SIP2. Partial implementation of digital library is possible with the 856 MARC tags where url location of the digital content can be mentioned and also digital content indexed through this software Koha is working to develop a hourly fine system; this is especially important for research where resources are lend out on hourly basis.

3. Discouraging Side of "Koha"

Open source Integrated Library Systems (ILS) are a new phenomenon in library automation industry. The main barrier between library professionals and Open Source software are lack of computer skills, proper awareness, Maintenance, supporting and training.

- **Installation:** Implementation of Open Source ILS is difficulty for library professionals because of its complex installation procedure. Most of the Open Source software suitable for libraries works only with Linux operating system. Installation of Open Source Library Management System in Linux operating system is not easy as like the installation of a user friendly Windows based software. Installation of Koha in libraries needs either the help of an expert or the library professionals should acquire expertise in Linux operating system.(BijuV.V). Nowadays many trainers are providing "Live CDs". However they have its own implications. Most important challenge is to install different

supporting PERL modules, etc.

- **Configuration:** Configuration of "Koha' is not user friendly for library professional. Locating the file and fixing of bugs, needs the Software skills "when" error " messages flashes. Koha has two parallel settings of with similar features i.e. configuration and administration which brings lot of confusion. Administration is more of library, users, item setting, etc. Configuration is more about how the system will function based on setting and vis-versa. .
- **Parameters Setting:** Though modules "Koha Administrative" and "System Preferences" are user friendly, the support of Computer Professional is advisable while setting the parameters. Sometimes the ambiguity of terminology creates lot of chaos and disaster. Many of the parameters are defined for the library's functionality but many are defined how the backend system will work.
- **Testing:** IT Professional support is always required to create Firewall settings, Proxy setting etc., support of IT professional is required as many of the system need to configured at the system level or coding level.
- **Datasheet;** Initially the cataloguer will get disappointed once s/he see the default MARC Bibliographical frame work. Koha standard / default data entry sheet displays 9 pages with 999 MARC21 tags, which create lot of confusion and discouragement to the librarian / cataloguers. However it can overcome by customizing/configuring the data entry template by selecting the limited number of tags as per initial requirement and MARC fields and subfields can be added later to input more information. It is recommended to start with 10-15 fields initially and later progress to add 2-3 tags after a gap.
- **Standards:** MARC21, Z39.50, ISO2709, SIP/NCIP Protocol, FRBR, etc. Many have theoretical knowledge about the standards but very important to know that what are the standards and how they are related to each other in practically way. For example if MARC21/USMARC is used in the data entry , Z39.50 or ISO2709 support will be there at the backend and 'Cataloguing masking' should not be done for MARC21 fields.
- **Acquisition:** Acquisition module of "Koha" is not straight forward compare to other standard software in India. Lot of customization /configuration need to be done before actually starting to use the acquisition module. . But feature like getting Online approval, no provision of online shooting of supply order to the vendor like other LMSs available in India. "Koha" is designed for general / broader library management system and not for specific market / demography / library. However benefits like multiple currencies, exchange rate, budget and expenses, can help libraries to manage.
- **Serial Control:** Serial management again is not straight forward like many local softwares. Serial management module is used to link the subscription details, frequency, vendors, etc. But good part is the prediction option, routing system, etc which help librarian and users alike. Few of the standard frequency is not covered in the Serial Management.

4. Indian Institute of Science Education and Research (IISERs) Mohali

The present scenario of higher education in India is changing drastically and it is more inclined towards computer related subjects by pushing the science education and research a back seat. As a result, the Government of India had to pay attention and feel its significance to constitute a committee under Chairmanship of renowned scientist and Scientific Advisor to the Prime Minister of India, Prof. C.N.R. Rao, (Bharat Ratna awardee). As a result creation of five new institutions devoted only to science education and research to be named "Indian Institute of Science Education and Research" broadly on the lines of the "Indian Institute of Science (IISc,), Bangalore" across India under the Ministry of Human Resource Development (MHRD), Government of India as autonomous body with the aim to create world class institutes in frontier areas of science education and research. They have been designed to reach the prestigious position in the global setting that IISc, IIMs and IITs presently enjoy.

Indian Institute of Science Education and Research Mohali (IISER Mohali) was established in 2007. As an autonomous Institution, the IISER Mohali awards B.S-M.S dual degree, M.S-PhD integrated and PhD degree in basic Sciences, i.e. mathematics, physics, chemistry and biology. It also offers courses in interdisciplinary areas like earth & environmental sciences, astronomy & astrophysics, computational sciences, humanities & social sciences, etc.

The selection of students for admission is on merit basis through qualifying any of the following examinations: (i) Kishore Vaigyanik Protsahan Yojana (KVPY) - a scholarship program funded by the Department of Science and Technology (DST), Government of India; (ii) IITJEE Merit List - Those who feature in the regular merit list and (iii) IISERs Common Aptitude / Screening Test - a common entrance exam conducted by all IISERs together for the students passed class XII in central or state boards and have got marks above the cut-off percentile available at DST website or INSPIRE fellowship certificate obtained from the boards.

For the PhD Programme, candidates who have passed one of the national level tests are admitted after conducting interview. Students of all courses including B.S-M.S dual degree, M.S-PhD integrated and PhD and Post Doctoral fellows get fellowship throughout their course period.

5. Implementation of "Koha" in IISER Mohali library

This part reveals only major steps taken by IISER Mohali library while implementing the "Koha", problems faced and lessons learned during the journey.

Initially the bibliographical data was in "Excel" format. We have installed 3.0 version of "Koha" in testing server and migrated the data from "Excel" to "Koha 3.0 staff client". The data was verified and the titles were cross checked with the Accession Nos. (Barcode number). Our library was only three years old when we installed "Koha", so we have limited number professional staff. Therefore the data entered by semi-professional staff in excel format contains many spellings, typos and grammatical mistakes etc., As a next step the category of items were created like "Books", "Periodicals " "Text Books " Reference Books " "CDs" " thesis" etc., and assigned items borrowing limits, holding period etc.. The search strategy in OPAC made our life easy to trace the mistakes in our data. So as soon as we were successful in migrating the data, the data was cleaned up by correcting / editing the errors.

Our next attempt was to create the profile of faculty and students. By creating different category of patrons like" Faculty, "MS", " PhD students, "Post Doctoral", "Project Staff" "Administrative" "Library Staff" etc., and assigned different privileges like number items against each category of Patron, No. of days , Fine structure and setting permission to view / edit their profiles etc., The softcopy of the patron images were uploaded as single file and verified for perfection.

The Librarian who is an Administrator of "Koha" has set up the permissions and login of Staff Client for library staff who attends various housekeeping activities of the library. The bibliographical MARC template was customized by using potentiality of fields and subfields. By using potentiality of fields and subfields, user can explore maximum facilities and features of "Koha". This type of extraordinary flexibility cannot be seen generally in commercial softwares and librarian can customize enhanced bibliographical template of his/ her library with more and more ability to facilitate more features as per client's requirement without depending on anybody else, even IT Professional.

The staff and librarian were trained and circulation was implemented with basic features. The bibliographical data was entered with mandatory information and original OPAC interface was made WEB OPAC and made available for testing for short period and was made on alive for public. Though we had teething problems initially like hanging up of the system, taking different "Due periods" for same category of patron etc., during the course of time the database was stabilized and the entire database was moved to production server. We made a customization in circulation module to create email "Over Due" reminders as

first reminder before "One month", second reminder "before One week" and third reminder before "One day" depend upon category of patrons.

Once the system was stabilized and library staff were familiar with the module where they are assigned the regular jobs and were also assigned to make a list of new requirement / modifications to be added in their specific area of work. The list was prepared and categorized into : 1. The features are already available 2. Features to be customized. We made the requirement as high / medium/ low priority

The features which available were implemented immediately and features to be customized were sent to out sourcing Company which is supporting "Koha" through our ERP (Enterprise resource planning) system.

6. The major issues to be addressed initially were :

- Customization of Barcode with caption of "IISER Mohali " and Accession No.
- Customization of Spine labels as per our requirement
- Categorization of Patrons issuing capacity
- Creating slab system for "Fine Structure"
- Generation of three types of e-mail reminders i.e "Advance" "Due on date" and "Over Due"
- Integration of "over Due " amount with e-mail reminders
- Integration Patron login to verify their profile, history of transactions through ERP system with "Single Sign Off"
- Customization of "WEB OPAC" into well featured, attractive, user friendly "Library Website" to avoid reader's inconvenience to search the cataloguing information through three layers of web pages. Proposed to have Online cataloguing search box on home page of library website itself to encourage the readers in searching of OPAC.
- To add three types of pricing information of an item in "Item level"
- To add "Indenter" name in item level information this should be retrievable
- Customization of "Modification log' of library staff
- Customization of a "Reserve the item" required by patron.

It was understood that some of these features which were not available in "Koha 3.0" version were available in the latest version. However during 2012, the "Koha 3.6" was in place but it is not bug free, so it was decided to install "Koha 3.06.04.000 version with freshly released "UBUNTU" of 12.04 and were installed in "Test ' server, tested and configured.

The following data was migrated in phase wise from Koha 3.0 version to 3.4 version, keeping the old version alive to the public as well as library staff to run the services. Whenever the data was shifting, the library services were interrupted for short period of time, otherwise both the servers were on and functional. While migrating the data, the date and time was noted to avoid redundancy, discrepancy of fresh data flowing to the database.

- All bibliographical data (Accession Register) was migrated from Koha 3.0.0 version to 3.06.04 Version successfully and verified the data randomly with old version as well as Accession register. Found that some of the titles did not carry accession numbers, Item types were missing in some records, Subject heading are missing in some records, but other details were in intact and order.

- The migration of patron records posed a separate, but equally tricky and challenge. All Patron data was migrated from Koha 3.0 version to 3.4 versions successfully and verified the data randomly. All the patron data transferred were intact except missing of some images of patron as well as blurring of images in some patrons profile and e-mails of some of the patrons were also missing.

- Circulation "Active" / 'Live" data: The data of patron who is active in circulation / holding the books under issue and also the "Items" under issue are comes under this category. The "active" meant either being created or having activity within the last two years, being in possession of library materials, or owing the library money. It is noticed that some discrepancy in the circulation history of the patron and reinstalled the module after fixing the problem.

- Circulation "Dead" / Passive Data: The data of patron who was passive in circulation and no holding of the item under issue and also the "Items" were also not under issue are comes under this category. It is verified and found that complete history of both Patron and "Item" was intact since inception of the database.

- Creation of original cataloguing agency Code : The name of our Institute was registered in " MARC complainant Institute 'and it was assigned by authorised body with unique code as "inmoiis ' as a original cataloguing agency

Again there were many teething problems in new version like assigning irregular "Due date", newly entered bibliographical details were missing, mismatch of subject headings , discrepancy in Barcode settings and spine labels, missing of e-mail id of patrons etc., These issues were addressed in high priority before moving forward. While bugs continued to crop up, we eventually established a better working relationship with IT professional and were able to communicate about these issues. The Firm has rectified the errors noticed by library. After the database was stabilized, the entire database was moved to "Production' server and taken it on regular track.

7. Creation of Authority files

In order to create uniformity and accuracy in data the following authority files were created:

- Publishers files
- Vendors file
- Subject heading by using Library of Subject headings
- Indenter file

The following customization were done in new version:

- The library has Customized of Barcode label with caption of "IISER Mohali " and Barcode No./ Accession No.
- The library has Customized Spine labels as per our requirement
- Different patrons were assigned with different capacity of (number of items) items issue as per our policy and different "Items" can be issued to different length of duration.

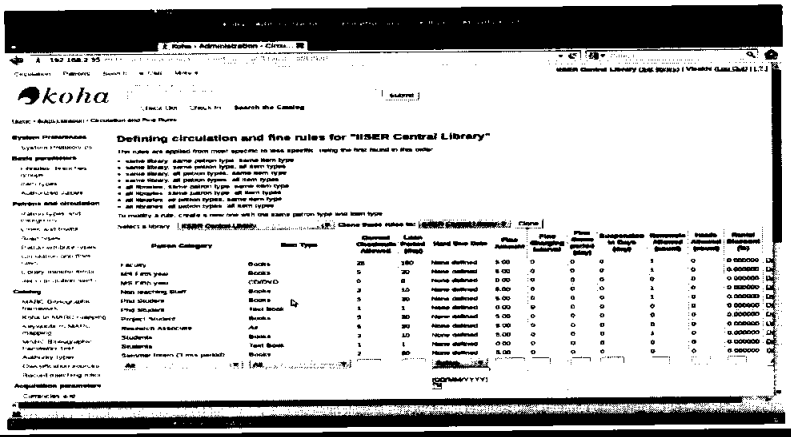


Fig. 1 Defined circulation and fine rules at "IISER Mohali Library"

Created different "Fine Structure "for different period of duration as slab fine system Except "TEXT BOOK" which are going to issue on hourly basis. The customized three types of "Advance Due " email reminder in previous version was failed in current version. Created three types of e-mail reminder i.e " Advance" "Due on date" and "Over Due" for each category of Patron and integrated with our Institute e-mail server to generate and shoot automatic emails every day at 4.00 am. Eg. faculty will get "advance reminder before 3 days" students will get two days etc.,

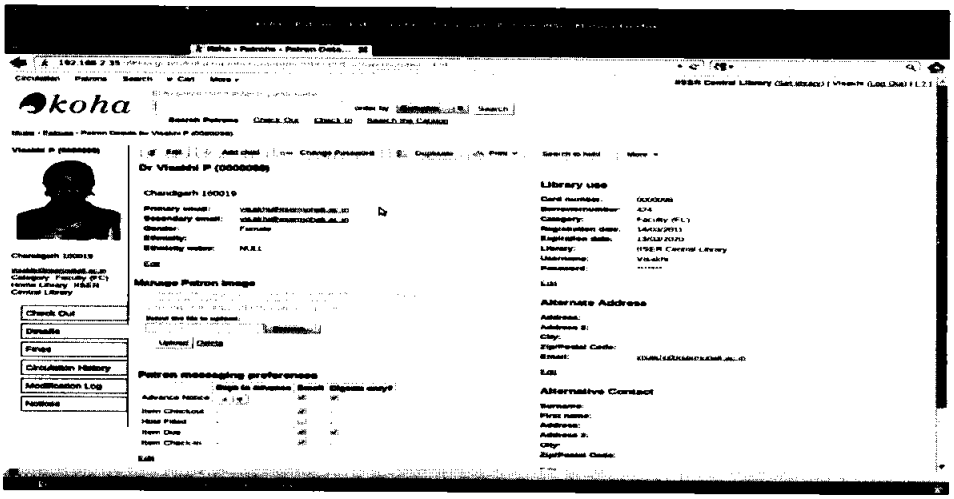


Fig.2 :Profile of Patrons with flexible email reminders

Email "Acknowledgement" after every issue and return of the "Item" within 60 seconds. Integrated the "over Due" amount along with e-mail reminders so that patron will come to know how much amount he has "Due" to pay.

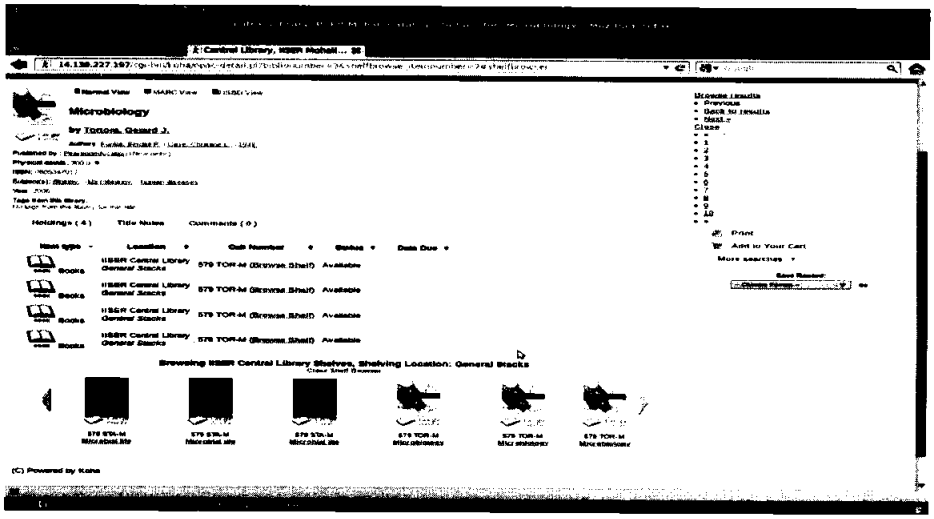


Fig.3 Virtual shelving of IISER Mohali library

The profile of Patron was integrated with ERP system of the Institute so that Patron can see his library transactions through ERP at single platform instead of remembering different logins i.e with "Single Sign Off".

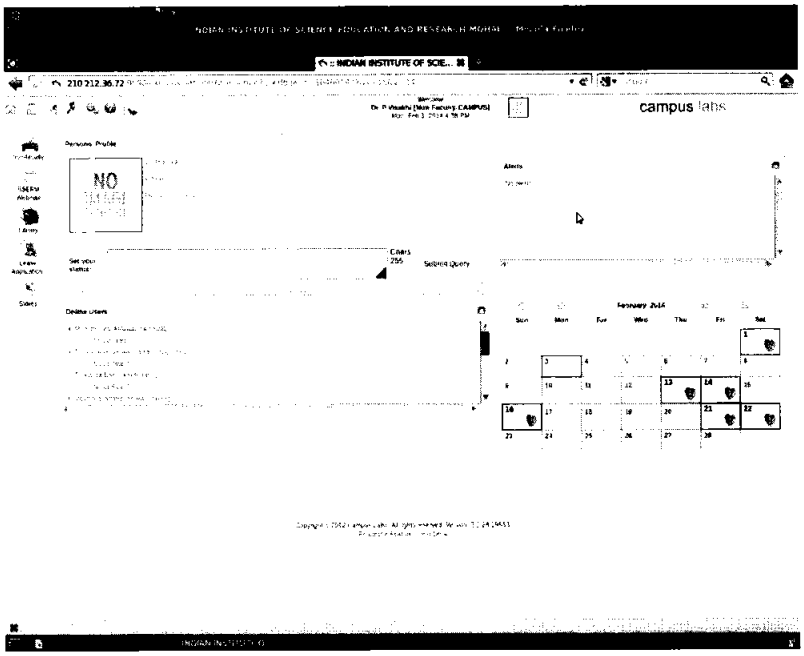


Fig.4 Integration of Koha Patron with ERP " Single Sing off"

Customized a simple "WEB OPAC" of "Koha" into well featured, attractive, user friendly "Library Website" to avoid reader's inconvenience to search the cataloguing information through three layers of web pages. Created Online cataloguing search box on home page of library website itself to encourage the readers in searching OPAC. All services and resources of library brought into this single library home page.

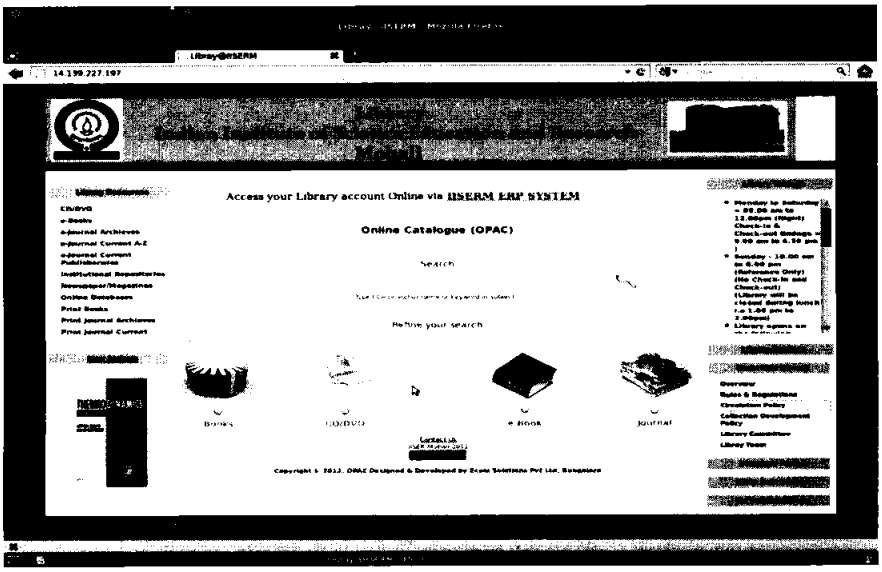


Fig. 5 Web OPAC of IISER Mohali library

Added three types of price information of an item in "Item details " : By using enhanced fields and subfields, the price information "List Price" "Price in Foreign Currency" "Price in INR after discount" etc., To add "Indenter" name in item information which is retrievable : To know the list of books Indented by any readers and also to track its usage rate etc.,

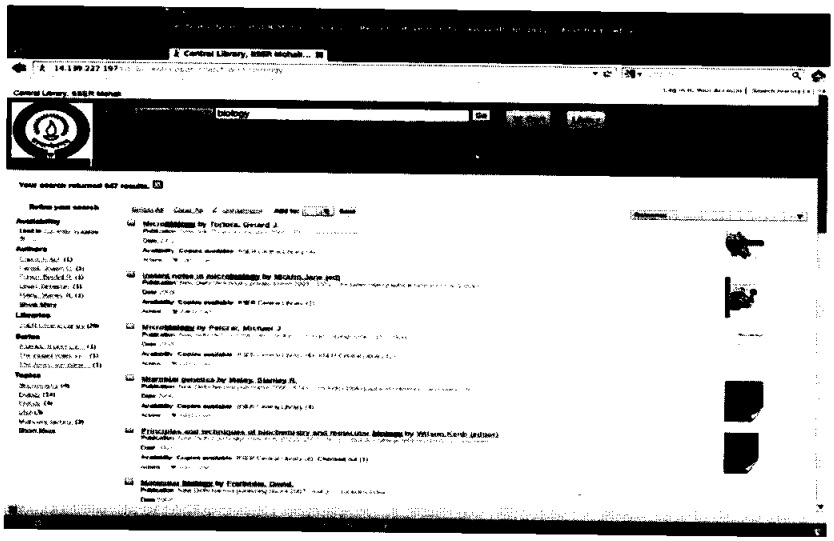


Fig.6 : Book images with user tagging facility through OPAC

Customization of "Modification log' of library staff : To know the activities chart of library Staff i.e transaction made, data entered / edited , profile created etc its time and date etc., Customization of a "Place hold" to reserve the item required by patron : The provision of "Reservation" of an item, was not available in' Koha 3.0" version.

8. Lessons Learnt

- "Koha" was designed to handle staff functions and public access, but it was not designed to handle federated search.(Karen) The lesson we learned was that we always have start the module with minimum basic fields, play on it, get better results and add the new requirement when we succeed in previous step rather than start in big way and end up with disaster.
- Liaison between library professionals and IT Professional is very crucial form implementation. Communication language between library professionals and IT professional is important and critical to understand the problem as well as solution attained. If Computer professional is not in position to understand the terminology and system of library being explained by library professional or vis-vis yields no results rather leads to frustration.
- We are lucky that the firm with which we are getting support has active , easily grasping library professional as team leader.
- Another major lesson was problem solving. Although librarians and IT professionals all problem-solve as part of their jobs, we found that the librarians wanted to look at the big picture, while the IT people wanted to start from specific examples .For example, many times the librarians felt they were not getting the results they expected to find in the catalogue, and a common request IT professional got was for the developer to explain to us how the search was working. From a developer's perspective, this question was too big and vague to answer. In response, the developer usually asked for an example, which sometimes looked to the librarians as if the developer was insisting that only one title was the problem rather than something larger. Once IT professional understood the developer's perspective, s/he was able to facilitate communication between the library and IT. (Karen)

9. Future Plans

- Customization of requirement under Acquisition
- Application of Access Control through "Biometrics"
- Application of RFID technology
- Application new format of "Fine Structure"
- Creation of Fine structure for hourly basis for text books and CDs

Note : Author is thankful to Mr R. Sunil Kumar and Ms Sangeetha who has helped in installation, testing and configuration.

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Implementing Web-Scale Discovery System: *Moving toward Open-Source*

Sam Popowich



The development of web-scale discovery systems in the last five years was initially led by proprietary integrated library system vendors. These products, however, proved to require a lot of time and energy to implement, and were not as flexible or as modern as we expected them to be. Since the early development of these systems, however, open-source alternatives arose based on the open-source model that had proved successful with institutional repository software. After doing an in-depth environmental scan of library discovery systems, we decided to leverage in-house skill and experience and develop our own system, using open-source software, and partnering with a third-party vendor for electronic journal content. In this presentation I will talk about our experiences in this implementation, what led us to make these decisions, and some setbacks that we experienced in the process.



Open Source Software, open-source model, web-scale discovery systems

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Open Source Movement in Indian Libraries: *An Analytical Study*

Rajeshwar Kumar, G



Open source software is, software that users have the ability to run, copy, distribute, study, change, share and improve for any purpose. The Open Source Software is currently one of the options preferred by the libraries, because the source code is available to users, who can change, modify the software to tailor it more closely to their own requirements. Open source library software's does not need the initial cost of commercial software and enables libraries to have greater control over their working environment. Library professionals should be aware of the advantages of open source software and should involve in their development. OSS is becoming an increasingly popular software development method. OSS has much potential for libraries and information centers and there are a number of open source projects available for automation of libraries and creation of digital libraries. This paper focuses on reviewing the currently available open source library management software's in India and highlights the features, advantages and need of open source software's in Indian libraries.



Open Source Software, Digital Library, Institutional Repositories, Content Management, OSI

1. Introduction

The Information and Communication Technology (ICT) has transformed the whole world into a global village. As of now the user can collect information even form the remote places with the help of Internet. The Open source software is currently one of the options preferred by the libraries, because of the services it offers for copying, modifying and distributing the absence of license restriction with other applications. In the phrase, Open source software, refers to two different related things namely: - Source Code and Object Code

- **Source Code:** It refers as a set of human readable and understandable instructions that comprised the receipt from which program can be made or else simply defined as a human readable computer code.
- **Object Code:** It refers an actual program which is complied of machine readable source code. It is then fed into computer microprocessor to perform various operations.

2. Open Source Movement

The history of open source software began with the early stages of computer and software development. At that, time programmers and developers frequently shared their software freely. Advent of companies in software development with the aim of profit making restricted the culture of sharing source code of software. Milestones in the history of open source Software is:

1983 - Richard Stallman formed GNU project.
1985 – Creation of Free Software Foundation.
1991 – Development of Linux kernel by Linus Torvalds.
1998 – Open Source Initiative (OSI) formed by Eric Raymond.

The two terms, "free" and "open source" has used synonymous for free distribution of software's. Popular licenses used for this purpose are the GNU General Public License (GPL), BSD license, GNU Lesser General Public License, MIT License, Mozilla Public License and Apache License. All these licenses have some

differences in their terms and conditions; they ensure users freedom to use, copying, distribution and improvement of software. Fundamentals of these licenses are similar to the philosophy of Free Software Foundation. "Free software is matters of the users' freedom to run, copy, distributes, study, change and improve the software" (Kumar, 2008).

3. Open Source Initiative (OSI)

The Open Source Initiative (OSI) is an organization dedicated to promoting open source software. The Open Source Initiative (OSI) is a non-profit corporation formed to educate about and advocate for the benefits of open source and to build bridges among different constituencies in the open-source community.

4. Advantages of Open Source Software

- **Lower software costs:** Open source solutions generally require no licensing fees. The logical extension is no maintenance fees. The only expenditures are for media, documentation, and support, if required.
- **Simplified license management:** Obtain the software once and install it as many times and in as many locations as you need. There's no need to count, track, or monitor for license compliance.
- **Lower hardware costs:** In general, Linux and open source solutions are elegantly compact and portable, and as a result require less hardware power to accomplish the same tasks as on conventional servers (Windows, Solaris) or workstations. The result is you can get by with less expensive or older hardware.
- **Scaling/consolidation potential:** Again, Linux and open source applications and services can often scale considerably. Multiple options for load balancing, clustering, and open source applications, such as database and email, give organizations the ability to scale up for new growth or consolidate to do more with less.
- **Support:** Support is available for open source—often superior to proprietary solutions. First, open source support is freely available and accessible through the online community via the Internet. And second, many tech companies are now supporting open source with free online and multiple levels of paid support. For example Liblime.
- **Escape vendor lock-in:** Frustration with vendor lock-in is a reality for all IT managers. In addition to ongoing license fees, there is lack of portability and the inability to customize software to meet specific needs. Open source exists as a declaration of freedom of choice.
- **Unified management:** Specific open source technologies such as CIM (Common Information Model) and WBEM (Web Based Enterprise Management) provide the capability to integrate or consolidate server, service, application, and workstation management for powerful administration.
- **Quality software:** Evidence and research indicate that open source software is good stuff. The peer review process and community standards, plus the fact that source code is out there for the world to see, tend to drive excellence in design and efficiency in coding.

5. Open Source and Libraries: The Principles and Philosophy

- Sharing Information Freely with no restriction
- In terms of user stratification both represent culture of collaboration and problem solving to fulfill internal and external needs.

- Both depend on human interaction to improve their respective services.
- Open access is the main philosophy behind both libraries and OSS

- **Widely Used OSS Applications**

Operating System	Linux
Web/ Proxy Server	Apache/Squid Cache
Web Browsers	Firefox,
Blogs	Word press, BlogSpot
Wikis	Media Wiki, TikiWiki
Open Software	Openoffice.org, PDF Creator
Content Management System	Drupal, Joomla
Instant Messengers	Gaim, Pidgin

6. Open Source Application for Libraries

- **Integrated Library Management Software:** When the library management system shares a common database to perform all the basic functions of a library, the system is integrated. An integrated library system (ILS)5, also known as a library management system (LMS) is an enterprise resource planning system for a library, used to track items owned, orders made, bills paid, and patrons who have borrowed usually comprises relational database with common modules like acquisition, cataloguing, circulation, serials OPAC, etc.
Examples: Koha, Evergreen, NewGenlib.

Integrated Library Management Software's

- **Koha:** Koha is the world's first open-source Integrated Library System (ILS) and it is distributed free of cost (open source, and so no license fee, ever). It was initially developed in New Zealand by Katipo Communications Ltd and first deployed in January of 2000 for Horowhenua Library Trust. Koha is built using library ILS standards and uses the OPAC (online public access catalog) interface. Currently being used by thousands of libraries all over the world. It includes modules for circulation, cataloging, acquisitions, serials, reserves, patron management, branch relationships, and more. Koha has web-based Interfaces. It is currently maintained by a team of software providers and library technology staff from around the globe and is in use worldwide in the libraries of all sizes. The name "Koha" comes from the Maori word for a gift or donation. It is distributed under the free open source general public license (GPL). It supports MARC 21 and UNIMARC support, Z39.50. It also has a provision for online reservations and renewals. The latest version of Koha is Koha 3.14.1 released in Nov, 2013.

- **NewGenlib:** NewGenLib, an integrated LMS is open source under the most widely used free software license, GNU GPL. NewGenLib is the result of collaboration between specialists in library automation and software specialists. NewGenLib is an integrated library management system developed by Verus Solutions Pvt Ltd. Domain expertise is provided by Kesavan Institute of Information and Knowledge Management in Hyderabad, India. NewGenLib version 1.0 was released in March 2005. On 9 January 2008, NewGenLib was declared Open Source Software under GNU GPL. The latest version of NewGenLib is 3.0.4 R1 released on 13 September 2012. Many libraries across the globe (mainly from the developing countries) are using NewGenLib as their Primary integrated library management system as seen from the NewGenlib discussion forum.
- **Evergreen**: Evergreen is open source library management software, freely licensed under the GNU GPL. Evergreen is an open source integrated library system, initially developed by the Georgia Public

Library Service for Public Information Network for Electronic Services (PINES), development began in June 2004. It was first launched in September, 2006. It is highly-scalable software for libraries that helps library patrons find library materials, and helps the libraries to manage, catalogue, and circulate those materials, no matter how large or complex the libraries are Evergreen has an active community that participates in its coding, documentation, and direction of the project.

- **PMB (PhpMyBibli): PMB (PhpMyBibli)** is a fully featured open source integrated library system. The project was initiated by François Lemarchand in October 2002, Director of the Public Library of Agneaux; it is now maintained by PMB Services (a French Company). The last 3.0 version was launched in September 2006, and since then frequent release updates were made and new features added to the existing version. PMB was initially licensed under GNU General Public License, which ensures the free availability of the software. Wiki, mailing lists and BerliOS hosting facilities allow communication between PMB developers and users. PMB is written using PHP programming language. It requires: PHP, Apache web server, MySQL database and Web browser.
- **Emilda:** Emilda is a complete Integrated Library System that features amongst others an OPAC, circulation and administration functions, Z39.50 capabilities and 100% MARC compatibility. MARC compatibility is achieved using Zebra in conjunction with MySQL.
- **Openbiblio:** Openbiblio is an open source integrated library management system, which was created in 2002 by Dave Stevens, who was interested in creating an easy-to-use, well-documented, easy-to-install library system. The current maintainer is Hans van der Weij. The software is popular with small and rural libraries worldwide due to its simplicity, extensive language support, and good documentation.

Table- 1: General features of selected Open Source Institutional Repository Software's

Software	URL	Developed by	Latest Version	License	Operating System	Language written	Functional Modules
Koha	http://koha-community.org	Katipo Communications for Horowhenua Library Trust	3.14.1 in 2013	GNU-GPL	Unix, Linux, Windows	Perl	OPAC, Full Catalogue, Circulation, Serials, Acquisition, Patron Management, Branch Mgt,, Reservations
NewGenlib	http://www.verussolutions.biz/web/	Verus Solutions Pvt Ltd	3.0.4R1in 2012	GNU-GPL	Windows, Linux	Perl	Acquisitions Cataloguing Serials Mgt, Circulation Administration, MISReports, End of Day Process
Evergreen	http://evergreen-ils.org/	Georgia Public Library Service, Public Information Network for Electronic Services (PINES)	2.4.4 in 2013	GNU-GPL	Windows, Mac, Linux	C, Perl, XUL, JS	Acquisitions Cataloguing, Circulation Administration, Inter-library Loan, OPAC

CDS/ISIS for Windows	www.unesco.org/isis	UNESCO	Winisis 1.5 build 3		Dos, Windows	Pascal, ISIS-DLL	Bibliographic Applications, Cataloguing
PhpMyBibli	www.pizz.net	Polerio Baboa	3.0 in 2006	GNU-GPL	Linux, Windows	PHP, PL/SQL, Python	Acquisition, Cataloguing, Circulation, WebOPAC
Emilda	www.emilda.org/Emilda	Realnode Ltd in cooperation with SDU	1.2.3 in 2005	GNU-GPL	Linux	MYSQL and Zebra	OPAC, Circulation, Administration
OpenBiblio	http://obiblio.sourceforge.net/	Open Biblio Community	0.71 in 2012	GNU-GPL	Windows, Linux,	PHP	Cataloguing, OPAC, Circulation, Report

- **Open source Institutional Repository Software's:**

- **Greenstone Digital Library Software (GSDL): Greenstone** is a suite of software for building and distributing library collections on the Internet or CD-ROM. It is open-source, multilingual software, issued under the terms of the GNU General Public License. Greenstone is produced by the New Zealand Digital Library Project at the University of Waikato, and has been developed and distributed in cooperation with UNESCO and the Human Info NGO in Belgium. Greenstone is an open-source system for the construction and presentation of information collections. It builds collections with effective full-text searching and metadata-based browsing facilities that are attractive and easy to use. Moreover, they are easily maintained and can be augmented and rebuilt entirely automatically. The system is extensible: software "plugins" accommodate different document and metadata types. The aim of the Greenstone software is to empower users, particularly in universities, libraries, and other public service institutions, to build their own digital libraries. Greenstone 2.86 is the latest version.

- **Dspace:** DSpace is freely available as open source software. Dspace is a groundbreaking digital institutional repository that captures, stores, indexes, preserves, and redistributes the intellectual output of a university's research faculty in digital formats. It is free and easy to install "out of the box" and completely customizable to fit the needs of any organization. It manages and distributes digital items, made up of digital files and allows for the creation, indexing, and searching of associated metadata to locate and retrieve the items. DSpace design and developed by Massachusetts Institute of Technology (MIT) Libraries and Hewlett-Packard (HP). DSpace was designed as an open source application that institutions and organizations could run with relatively few resources. It is to support the long-term preservation of the digital material stored in the repository. It is also designed to make submission easy. DSpace supports submission, management, and access of digital content. DSpace 4.0 is the latest version.

- **E-Prints: EPrints** is a free and open-source software package for building open access repositories that are compliant with the Open Archives Initiative Protocol for Metadata Harvesting. It shares many of the features commonly seen in document management systems, but is primarily used for institutional repositories and scientific journals. EPrints has been developed at the University of Southampton School of Electronics and Computer Science and released under GPL license. Version 3.3.12 is the latest version of Eprint released in July, 2013. EPrints which are preprints (before peer review) and post prints (after peer review), of research journal articles. "Eprints" = preprints + post prints.

- **Fedora: Fedora** (or **Flexible Extensible Digital Object Repository Architecture**) is a digital asset management (DAM) architecture upon which institutional repositories, digital archives, and digital

library systems might be built. Fedora was originally developed by researchers at Cornell University and the University of Virginia Library as an architecture for storing, managing, and accessing digital content in the form of digital objects inspired by the Kahn and Wilensky Framework. Fedora began as a DARPA and NSF-funded research project at Cornell University's Digital Library Research Group in 1997, where the first reference implementation and a CORBA-based technical implementation were built.[3] Since then, several modifications have been made to the architecture, and in late 2005, version 2.1 was released. In 2003 Red Hat, Inc. applied for trademark status for the name "Fedora" to be associated with their Linux operating system project. Fedora supports ingest and export of digital objects in a variety of XML formats. This enables interchange between Fedora and other XML-based applications and facilitates archiving tasks. Digital objects exist within a repository architecture that supports a variety of management functions. All functions of Fedora, both at the object and repository level, are exposed as web services.

- **Invenio:** Invenio is an open source software package that provides the tools for management of digital assets in an institutional repository. The software could typically be used for creating open access repositories for scholarly and/or published digital content, still with its great flexibility Invenio could also be used as a digital library. Invenio is developed by the CERN Document Server Software Consortium, and is freely available for download. There are free and paid support models are available. The service provider TIND Technologies was established in 2013 to accommodate the growing demand for support of Invenio. Invenio complies with standards such as the Open Archives Initiative metadata harvesting protocol (OAI-PMH) and usesMARC 21 as its underlying bibliographic format.

Table- 2: General features of selected Open Source Institutional Repository Software's

Software	URL	Developed by	Latest Version	License	Operating System	Language written	Logo
GSDL	http://www.greenstone.org	New Zeland Digital Library Project, with UNESCO and the Human Info NGO	2.86 in 2013	GNU (General Public License)	Windows, Linux	Perl	
DSpace	http://www.dspace.org	Massachusetts Institute of Technology (MIT) Libraries and Hewlett-Packard	4.0 in 2013	BSD License	Windows, Linux	JAVA	
Fedora	http://www.fedora-commons.org	Cornell University Information Science and the University of Virginia Library	3.71 in 2013	Apache License 2.0	Linux	JAVA	Fedora
EPrints	http://software.eprints.org	University of Southampton	3.3.12 in 2013	GPL	Unix, Linux	Perl	eprints

Invenio	http://invenio-software.org/	CERN Document Server Software Consortium	1.1.2 in 2013	GPL	Unix, Linux, Mac	Python	INVENIO
VuDL	http://vudl.org/	Villanova University's Falvey Memorial Library	0.4.1 in 2011	GPL Open Source License	Windows, Mac and Linux	Perl	

7. Conclusion

Libraries have a growing role in managing the output of their institution due in part of the open access movement. Open Source Software incorporates an interface that makes it easy for people to create their own library collections. The OSS has a solution to reduce the cost. OSS has much more potential for libraries and information centers, and there are numerous projects, including Koha, NewGenlib, Evergreen, etc. that demonstrate its practicability in this context. It gives library staff an option to be actively involved in enhancements and testing new versions. Koha and NewGenlib are among the top OSS which is widely used in India. Coming to the institutional repositories The Dspace is fairly powerful software. The major advantage of the software is that it allows submission of digital documents by it members. Other digital library software like Eprints is also widely used. Educational institutions dominate in the use of these packages. However, many institutions have implemented digital libraries, but not all are online. Open access of knowledge is possible only if these repositories has made online. India is benefiting well from the open source movement.

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Role of Open Source Library Automation Software's: *Special Reference to ILMS KOHA, NEWGENLIB, ABCD, E-GRANTHALAYA*

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Abstract

Library professionals should be aware of the advantages of open source software and should involve in their development. They should have basic knowledge about the selection, installation and maintenance. Open source software requires a greater degree of computing responsibility than commercial software. Library professionals do not think seriously about the advantages of open source software for automation and hence are reluctant to use it. They do not have the expertise to support open source software. This paper is focusing on reviewing open source library management system packages like Koha,NewgenLib,ABCD, & E-Granthalaya.

Open Source Software, Open Source Movement, Koha, NewgenLib, ABCD, & E-Granthalaya.

1. Introduction

Many Libraries do not have huge amounts of money to burn, and any that they do get usually goes to purchasing additional resources Because of this need for software (and the installation and training costs associated with any), and the lack of money available to spend on it, many libraries are left to fend for themselves when it comes to staying up to date with the latest technology. Unless, of course, they embrace the open source movement and use some of the countless software solutions available to help out. Most software that we all use every day is known as "**proprietary**", which in a nutshell means that it costs money and that the actual code of the software is restricted, in that the code of the software cannot be modified, copied, or changed from its original construction. The code is "unreadable" and pretty much is what it is. **Open source software**, on the other hand, is quite the opposite. The open source mentality revolves around sharing and collaboration, and these two important elements describe open source software perfectly. First and foremost, open source software is free for anyone to have; more importantly, not only is the software free, but it is also free for anyone to copy, hack, modify, etc. This increases the possibilities of a software program's potential because of this free-thinking model. Many large groups of programmers have customized basic open source programs into whatever they deemed necessary, and have in turn given these modifications back to the open source community for free where others can continue to build on their work. There are many different kinds of open source software solutions out there today that could be embraced by the library. There's basic operating system, document processing programs, Library Management Software (LMS) and Digital Library software.

2. Advantages of Open Source Software

- **Lower software costs**: Open source solutions generally require no licensing fees. The logical extension is no maintenance fees. The only expenditures are for media, documentation, and support, if required.
- **Simplified license management:** Obtain the software once and install it as many times and in as many locations as you need. There's no need to count, track, or monitor for license compliance.
- **Lower hardware costs:** In general, Linux and open source solutions are elegantly compact and portable, and as a result require less hardware power to accomplish the same tasks as on conventional servers (Windows, Solaris) or workstations. The result is you can get by with less expensive or older hardware.

- **Scaling/consolidation potential:** Again, Linux and open source applications and services can often scale considerably. Multiple options for load balancing, clustering, and open source applications, such as database and email, give organizations the ability to scale up for new growth or consolidate to do more with less.
- **Reliability and Quality**: When looking at improved quality, you have to compare the products themselves. It is impossible to say that open source software is better than proprietary software in terms of reliability and quality - both have a range of products. However, mature open source software is generally viewed to be of good quality and reliability. If your business is not familiar with open source software, you may only want to review some of the more mature products (e.g. Linux, Apache and Send mail).
- **Support:** Support is available for open source—often superior to proprietary solutions. First, Open source support is freely available and accessible through the online community via the Internet. And second, many tech companies are now supporting open source with free online and multiple levels of paid support. For example Liblime.

3. Open Source Library Automation Software

- **Koha: Integrated Library System:** Koha (http://www.koha.org), is the first open source fully featured Integrated Library System (ILS) written in the LAMP paradigm. Development of Koha, began in 1999, funded by a group of libraries in rural New Zealand that found proprietary software expensive and lacking in needed features [3][4]. The full featured Koha was developed initially in New Zealand by Katipo Communications Ltd and first deployed in January 2000 for Horowhenua Library Trust. Koha is currently maintained by a team of software providers and library technology staff from around the globe. For those of you out there unfamiliar of what an ILS is, well, it is a system of keeping track of the operations of a library - payroll, expenses, purchases, and most importantly, keeping track of the various media being checked out by the librarians patrons. Many smaller libraries cannot afford to purchase, install, and maintain an ILS, and Koha is a perfect alternative. Koha is built using library ILS standards and uses the OPAC (open public access catalog) interface. In addition, Koha has no vendor-lock in, so libraries can receive tech support from any party they choose.

- **Features of Koha:** Some of the key features of Koha are listed below:
  - Web Based.
  - Copy cataloguing and z39.50.
  - MARC21 and UNIMARC for professional cataloguers.
  - Manage online and off line resources with the same tool.
  - RSS feed of new acquisitions.
  - E-mail and/or txt patron's overdue and other notices.
  - Print barcodes.
  - Serials management module.
  - Full catalogue, circulation and acquisitions system for library stock management.
  - Web based OPAC system.
  - Simple, clear search interface for all users.
  - Simple and comprehensive acquisition options.
  - Multi-tasking and enables updates of circulation, cataloguing and issues to occur simultaneously.
- **The NewGenlib Open Source Software:** The NewGenlib Has appeared as open source software during 2005,the latest version of which is 2.0. According to the homepage of this software "it is the

result of collaboration between domain specialists in library automation and software specialists" (http;www.verussolutions.biz/web/node/18 Accessed on 01.07.2008) The Kesavan institute of information and knowledge management, a professional body at Hyderabad has provided the said domain knowledge. The software development expertise has come from a company called Verus Solutions Pvt.Ltd. A Memorandum of Understanding between above- mentioned organizations has been signed to keep the product up to date both by domain specialist's ans software professionals. It has the capability to create fully automated library. The download count of this software, as on 23 march 2008, is 5172.

- **Features of Newgenlib Software:** Some the Features of this open source software are listed below:
  - **Licensing**: The NewGenlib open source is covered under the most widely used open source software licensing system called GNU General Public License.
  - **Source Code & User Manual**: The open source binaries and source code of Newgenlib open source software are downlodable. Installation notes for Linux and windows are also available at the the user Manual is also downloadable.
  - **User's Feedback:** The users of the software can post their feedback with views, Problems, solutions, Discussions,etc to the organization.
  - **Architecture & Backend:** it is web-based and has a multi-tier architecture; it uses Java (a swing-based librarian's GUI), the JBoss (J2EE-based Application server) and PostgreSQL as default backend.
  - **Functional Modules:** NewGenlib's functional modules are : acquisition management (monographs and serials); technical processing; circulation control; system configuration; a desktop reports application and an end-of-day process (scheduler) application.
  - **Data Create & Exchange Format**: it is compliant with MARC-21 format. It has a MARC editor. It allows seamless bibliographic and authority data import into cataloguing templates.
  - **Mail Server**: SMTP mail servers can be configured for e-mails and that can be sent form functional modules.
  - **Open Access Compatibility**: NewGenlib open source allows creation of institutional open access (OA) repositories compliant with the OAI-PMH.
  - NewGenlib open source is Unicode 3.0 compliant.
  - **RFID Technology**: it has inbuilt RFID Support.
- **ABCD Open Source Software:** ABCD, in English, is "Automation of libraries and Centres of Documentation". The name itself already expresses the ambition of the software suite to provide not only automation functions for traditional libraries but also other information providers such as documentation centres. It is developed by BIREME (WHO, Brazil) in collaboration with the Flemish Interuniversity Council, Belgium, and using UNESCO□s ISIS database technology. This software provides flexibility and versatility. Any bibliographic structure, including all types of digital resources, can be managed by this software and created by itself along with non-bibliographic structures. Many workshops are organized all over the world. Recently, the first Asian workshop was organized in New Delhi in May 2011.

- **Features of ABCD Open Source Software:** ABCD is built with such technologies as ISIS database, ISIS formatting language, CISIS, ISIS Script, ISIS NBP, Java Script, Groovy and Jetty, PHP, MySQL, Apache, and YAZ.
  - The software is fully web-based, so can be used and managed from any current web-browser.
  - All main functions of the library management are integrated using the same interface and databases.

- Bibliographic records can be imported from external library catalogs / servers through Z39.50 facilities.
- Full MARC 21 compatibility with fields, indicators, and subfields defined by Library of Congress.
- OPAC with simple Google-like search as well as advanced search with Boolean operators, truncation, and field-limitation for all kind of databases, locally created or external.
- Access to both physical and electronic documents (local or on the internet) with the same interface.
- Library staff can define, copy or edit any new database structure with existing ISIS-applications such as MARC, CEPAL, UNIMARC, and Dublin Core.
- Available in many languages like English, French, Spanish, Portuguese while more language versions are on the way.
- Import and export data in ISO-2709 format or text-format.
- Contents and bibliographic resources, both local and external, can be added easily without HTML-programming.
- The basic loan module offers detailed definition of objects and users categories and policies for each combination, fine calculation and calendar definitions, etc., while the advanced module adds reserve, "my library" page, multiple loan policy definitions, and access to external SQL-based user-data.
- Excellent serials management with a fully implementation of the ISSN standard and union catalog function.
- Statistical report generation with graphical presentation of any defined set of variables in the databases.
- "Scheme-less" records. As a consequence of this, ISIS accepts any structure and includes structure-definition tools, and so does ABCD.
- Freedom of database structure. ISIS records carry their individual structural description as a "header" within themselves, unlike that in relational table-based databases where all records in the same table share the same structure by necessity. Therefore, each record can have its own different structure. In fact for most record-related operations in ISIS, there is no need to formally describe the structure. So one could consider ISIS as using "scheme-less" records. As a consequence of this, ISIS accepts any structure and includes structure-definition tools, and so does ABCD.

ABCD software is very easy to install. It contains package of all the necessary software rograms. One can download the software for Windows or Linux platform. Download links and more information:

- http://bvsmodelo.bvsalud.org/php/level.php?lang=en&component=27&item=13
- https://sites.google.com/site/abcdlibraryautomationsoftware
- **E-Granthalaya:** e-Granthalaya is a Library Management Software facilitates to automate not only the in-house activities of the library but also the user services. The first version of the Software was developed by the Karnataka State center of NIC, Bangalore. Later the development was taken over by National Informatics Centre, Department of Information Technology, Ministry of Communications and Information Technology, Government of India. The software has been designed by a team of experts from software as well as Library and Information Science discipline. Using this software the libraries can automate in-house activities as well as user services. The software can be implemented either in stand-alone or in client-server mode where database and WebOPAC are installed on the server PC while the data entry program is installed on client PCs. The software provides LAN/Web based data entry solutions for a cluster of libraries where a common database can be created with Union Catalog output. The software provides Web OAPC interface to publish the library catalog over Internet/Intranet. The software runs on Windows platform.

- **System Requirements for the installation of E-Granthalaya:** For Stand-Alone Mode (All the Components to be installed on a Single PC :
  - Hardware: Pentium or above with backup device, Min 1 GB RAM, 40GB HDD
  - OS: Windows XP(SP2)/Vista/win 7
  - DBMS: MS SQL Server 2005/2008 (Express Ed) - FREE
  - Connectivity: LAN/Internet Connectivity

- **For Clietn-Server Mode**:
  - Server PC:
  - Hardware: High-End Server / Rack Server with 4GB RAM, 80GB HDD
  - OS: Windows Server 2008/R2 (Standard/Enterprise Edition)
  - RDBMS: MS SQL Server 2008 R2 (Standard Edition)
  - Connectivity: LAN/Internet Connectivity
  - BarCode Printer (Any Model/Make) with Barcode Reader.

Software Components: e-Granthalaya contains following components, some of these are installed in the Server PC while rest of these are installed in the Client PCs:

- Database (MS SQL Server 2005/2008) - on Server PC (Windows 2003/2008)
- Web OPAC - on Server PC
- Data entry program - on client PCs

- **Features E-Granthalaya:**
  - Multi-lingual, UNICODE compliant database.
  - Stand-Alone/ LAN / WAN based data entry solution.
  - Covered all in-house activities and user services.
  - Common database for cluster of libraries.
  - Common web based search interface (Web OPAC).
  - Authority files for common data e.g. Authors, Publishers, Subjects, Type of Documents, etc.
  - Member Registration with unique entitlement and due days.
  - Single form for circulation of all kinds of documents and Inter Library Load (ILL).
  - Bar Code generation facility.
  - Automatic generation of journals Schedule.

4. Conclusion

In this paper, several open source software packages related to library management systems are reviewed. The review is focusing on four main components in a library management system including traditional services, so it seems that there are some very powerful solutions available today that could be used to create a much more resourceful library. By using open source software in the library, money that otherwise would be spent on software solutions can be used for other important resources, such as purchasing additional media resources or can be used to hire educated, technical support that provides patrons with the know how to better use already existing resources.

In addition, this free software is constantly being updated, changed, and customized to meet the library's needs. While all of this is fine and dandy, and sounds like the win-win solution for your library, there are still pitfalls and hurdles we'll need to overcome. Hopefully this article provides some introductory information as to how to wean your library off of traditional computing products and dive into the pool of open source resources available.

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Study of Open Source Software for Various Applications

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The information and communication technology has changed the dynamics of human life and society. It has added new dimensions like e-learning, e-commerce, e-library, e-books, e-journals, e-banking, e-governance, etc. Recent decades have witnessed the success of Open Source Software (OSS) development as a new phenomenon in the software industry. The design and development of open source software is different from proprietary source software. We observed bazaar model for development of OSS. The top four reasons individuals or organizations choose open source software are Lower Cost, Security, No Vendor 'Lock In', and Better Quality. Open source software is used by the millions of organizations in the world. There are many open source software for different types of users. Open source operating system is Linux which is becoming popular. We discussed some open source softwares and their features like drupal, newgenlib, open office, joomla.



open source software, drupal, newgenlib, openoffice, joomla

1. Introduction

The information and communication technology has changed the dynamics of human life and society as well as software development. It has added new dimensions like e-learning, e-education, e-conferencing, e-commerce, e-mail, e-meeting, e-library, e-books, e-journals, e-banking, e-reservation, e-governance and the list is now becoming endless. Since the mid 1990s, there has been a surge of interest among academics and practitioner in open source software (OSS). The design and development of open source software is significantly different from that of proprietary software. Open source software is developed by community for community. The development of OSS is of interdisciplinary nature and needs knowledge and expertise from many scientific disciplines such as computer science, management and organization, science, engineering, technology, social sciences, law, economics and psychology.

Recent decades have witnessed the success of Open Source Software (OSS) development (von Krough and von Hippel 2006; Fitzgerald 2006). Major companies such as IBM, Oracle and HP, as well as large venture capitalists, are investing generously in the communities that develop OSS (Gallivan 2001). Many people around the world prefer open source software because they have more control over that kind of software. They can examine the code to make sure it's not doing anything they don't want it to do, and they can change parts of it they don't like. Users who aren't programmers also benefit from open source software, because they can use this software for any purpose they wish—not merely the way someone else thinks they should.

2. Model for developing Open Source Software

In 1997 essay The Cathedral and the Bazaar, open-source evangelist Eric S. Raymond suggests a model for developing OSS known as the *bazaar* model. Gregorio Robles suggests that software developed using the bazaar model should exhibit the following patterns:

- **Users should be treated as co-developers:** The users are treated like co-developers and so they should have access to the source code of the software. Furthermore users are encouraged to submit additions to the software, code fixes for the software, bug reports, documentation etc. Linus's law states, "Given enough eyeballs all bugs are shallow." This means that if many users view the source code, they will eventually find all bugs and suggest how to fix them.

- **Early releases:** The first version of the software should be released as early as possible so as to increase one's chances of finding co-developers early.
- **Frequent integration:** Code changes should be integrated (merged into a shared code base) as often as possible so as to avoid the overhead of fixing a large number of bugs at the end of the project life cycle. Some open source projects have nightly builds where integration is done automatically on a daily basis.
- **Several version:**There should be at least two versions of the software. There should be a buggier version with more features and a more stable version with fewer features. The buggy version (also called the development version) is for users who want the immediate use of the latest features, and are willing to accept the risk of using code that is not yet thoroughly tested.
- **High modularization:**The general structure of the software should be modular allowing for parallel development on independent components.
- **Dynamic decision making structure:** There is a need for a decision making structure, whether formal or informal, that makes strategic decisions depending on changing user requirements and other factors.
- **Development tools:** In OSS development, the participants, who are mostly volunteers, are distributed among different geographic regions, so there is need for tools to aid participants to collaborate in source code development. Often, these tools are also available as OSS. Scholars Casson and Ryan have pointed out several policy-based reasons for adoption of open source - in particular, the heightened value proposition from open source (when compared to most proprietary formats) in the following categories:
  - Security
  - Affordability
  - Transparency
  - Perpetuity
  - Interoperability
  - Flexibility
  - Localization—particularly in the context of local governments (who make software decisions). Casson and Ryan argue that "governments have an inherent responsibility and fiduciary duty to taxpayers" which includes the careful analysis of these factors when deciding to purchase proprietary software or implement an open-source option.

3. Why do people prefer using open source software?

Many people prefer open source software because they have more control over that kind of software. They can examine the code to make sure it's not doing anything they don't want it to do, and they can change parts of it they don't like. Users who aren't programmers also benefit from open source software, because they can use this software for any purpose they wish—not merely the way someone else thinks they should. Others like open source software because it helps them become better programmers. They can learn to make better software by studying the source code others have written. They can also share their work with others, inviting comment and critique.

Programmers can charge money for the open source software they create or to which they contribute. But because most open source licenses require them to release their source code when they sell software to others, many open source software programmers find it more lucrative to charge users for *software services and support* rather than for the software itself. This way, their software remains free of charge and they make money helping others install, use, and troubleshoot it.

The top four reasons (as provided by Open Source Business Conference survey) individuals or organizations choose open source software are:

- Lower Cost,
- Security,
- No Vendor 'Lock In', and
- Better Quality.

4. Organizational adoption of open source software: barriers and remedies

Perhaps the business case for adopting open source software is an easy sell. After all, the software is free, and can be simply downloaded from the Internet and installed or customized as needed. Organizations interested in reducing the licensing fees of proprietary software, while also avoiding the penalties and legal liabilities associated with their illegal use, can definitely consider open source software a plausible alternative. However, less obvious than the cost savings but equally important are the barriers ("hidden costs") of adopting open source software.

Open source software has created considerable excitement in the business world over the last decade. These applications, designed by groups of volunteer software developers, have the potential to break the current dominance of proprietary software and restrictive licenses for many business applications, reduce software development time and improve software quality, and most importantly, bring much needed software applications within the reach of individuals and small businesses, who cannot otherwise afford such software. Further, unlike proprietary software, open source software applications make their source code available for free, which can be customized to fit the unique needs of specific organizations.

Many organizations have caught on to open source software and realized significant cost savings in technology expenditure as a result. For instance, Cendant Travel Distribution Services replaced a $100 million mainframe system with a $2.5 million system running on 144 Linux servers. Amazon.com cut its technology expenditure from $71 million to $54 million by switching to open source applications. Sabre Holdings saved tens of millions of dollars by adopting MySQL, an open source database product. Though the basic open source software is free, the prospect of paid ancillary products and services such as hardware and consulting has motivated many erstwhile proprietary technology vendors such as Hewlett-Packard, IBM, and Sun Microsystems to embrace open source software and offer value-added services based on such software.

5. **DRUPAL:** Drupal is a free open source software package that allows you to easily organize, manage and publish your content, with an endless variety of customization. Drupal is an open source content management platform powering millions of websites and applications written in PHP. It's built, used, and supported by an active and diverse community of people around the world. Use Drupal to build everything from personal blogs to enterprise applications. Thousands of add-on modules and designs let you build any site you can imagine. Distributions are a collection of pre-configured themes and modules for feature-rich web sites giving you a head start on building your site. Build your own online communities, media portal, online store, and more. Drupal is used by some of the biggest sites on the Web, like The Economist, Examiner.com and The White House, etc. Drupal is open source software maintained and developed by a community of 630,000+ users and developers. It's distributed under the terms of the GNU General Public License (or "GPL"), which means anyone is free to download it and share it with others. This open development model means that people are constantly working to make sure Drupal is a cutting-edge platform that supports the latest technologies that the Web has to offer. The Drupal project's principles encourage modularity, standards, collaboration, ease-of-use, and more. Drupal contains 25,146 Modules 1,913 Themes, 743 Distributions. It is used by 1,023,551 people in 230 countries speaking 181 languages power Drupal.

It is used as a back-end framework for at least 2.1% of all websites worldwide ranging from personal blogs to corporate, political, and government sites including whitehouse.gov and data.gov.uk. It is also used for knowledge management and business collaboration.

The core Drupal distribution provides a number of features, including:

- Access statistics and logging
- Advanced search
- Blogs, books, comments, forums, and polls
- Caching and feature throttling for improved performance
- Descriptive URLs
- Multi-level menu system
- Multi-site support
- Multi-user content creation and editing
- OpenID support
- RSS feed and feed aggregator
- Security and new release update notification
- User profiles
- Various access control restrictions (user roles, IP addresses, email)
- Workflow tools (triggers and actions)

6. **NEWGENLIB:** NewGenLib is an integrated library management system developed by Verus Solutions Pvt Ltd. Domain expertise is provided by Kesavan Institute of Information and Knowledge Management in Hyderabad, India. NewGenLib version 1.0 was released in March 2005. On 9 January 2008, NewGenLib was declared Open Source Software under GNU GPL. The latest version of NewGenLib is 3.0.4 R1 released on 13 September 2012. Many libraries across the globe (mainly from the developing countries) are using NewGenLib as their Primary integrated library management system (ILMS) as seen form the NewGenlib discussion forum.

   - **Modules & Functions: NewGenLib has following main modules:**
     - Acquisitions
     - Technical Processing
     - Serials management
     - Circulation
     - Administration
     - MIS Reports
     - Task to do today (daily scheduler)
     - OPAC
   - **Some advanced functional features:**
     - Android mobile and tablet capable
     - Integration with Twitter helping send messages of transactions directly to users' Twitter accounts.
     - Flexibility of defining own search field in OPAC.
     - Enhanced contents and interactive OPAC like Availability of Book jackets, Google preview, Comments/ Book review, Tagging, Favorite reading list, etc
     - Zotero compliant OPAC
     - RSS Feeds in OPAC
     - Faceted Browsing (Refining search results)

- Suggestion for other books in the rack
- RFID supports
- Provision for frequently used predefined templates along with freedom of defining own customized data entry template s in Cataloguing
- Configurable SMS system - a proof of transaction.
- Integration with Gmail or paid mailbox account. This enables automatic sending of email to patrons during issue /return.
- Enhanced Report Module for generating in .csv format with a provision for wide customization.
- Provision for integrating with Vufind SOPAC (Ex: OPAC of the Library of Bangalore University).
- Catalogue can be harvested through Google site map, and thus the visibility of the library can be further improved.

7. **JOOMLA**Joomla is a free and open-source content management framework (CMS) for publishing web content. It is built on a model–view–controller web application framework that can be used independently of the CMS. Joomla is written in PHP, uses object-oriented programming (OOP) techniques (since version 1.5) and software design patterns, stores data in a MySQL, MS SQL (since version 2.5), or PostgreSQL (since version 3.0) database, and includes features such as page caching, RSS feeds, printable versions of pages, news flashes, blogs, polls, search, and support for language internationalization.

   As of July 2013, Joomla has been downloaded over 35 million times. Over 6,000 free and commercial extensions are available from the official Joomla! Extension Directory, and more are available from other sources. It is estimated to be the second most used content management system (CMS) on the Internet after WordPress. Joomla was the result of a fork of Mambo on August 17, 2005. At that time, the Mambo name was trademarked by Miro International Pvt. Ltd., who formed a non-profit foundation with the stated purpose of funding the project and protecting it from lawsuits.

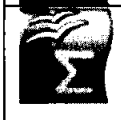
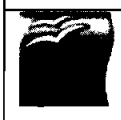
   Joomla extensions help extend the Joomla websites' ability. There are five types of extensions for Joomla!: Components, Modules, Plugins, Templates, and Languages. Each of these extensions handles a specific function.

   - **Components:** The largest and most complex extensions of them all; they can be seen as mini-applications. Most components have two parts: a site part and an administrator part. Every time a Joomla page loads, one component is called to render the main page body. Components are the major portion of a page because a component is driven by a menu item and every menu item runs a component.
   - **Plugins:** These are more advanced extensions and are, in essence, event handlers. In the execution of any part of Joomla, a module or a component, an event can be triggered. When an event is triggered, plugins that are registered with the application to handle that event execute.
   - **Templates:** Describe the main design of the Joomla website and are the extensions that allow users to change the look of the site. Users will see modules and components on a template. They are customizable and flexible.
   - **Modules:** Rendering pages flexibly in Joomla requires a module extension, which is then linked to Joomla components to display new content or new images. Joomla modules look like boxes – like the "search" or "login" module. However, they don't require html to Joomla to work.
   - **Languages:** Very simple extensions that can either be used as a core part or as an extension. Language and font information can also be used for PDF or PSD to Joomla conversions.
   - **Apache Openoffice:** Apache OpenOffice (AOO) is an open-source office productivity software suite. It descends from OpenOffice.org and IBM Lotus Symphony, and is a close cousin of LibreOffice.

> Apache OpenOffice contains a word processor (Writer), a spreadsheet (Calc), a presentation application (Impress), a drawing application (Draw), a formula editor (Math), and a database management application (Base).[6]

Apache OpenOffice's default file format is the OpenDocument Format (ODF), an ISO/IEC standard, which originated with OpenOffice.org. It can also read a wide variety of other file formats, with particular attention to those from Microsoft Office. Apache OpenOffice is developed for Linux, OS X and Windows, with ports to other operating systems. It is distributed under the Apache License.[4] The first release was version 3.4.0, on 8 May 2012. OpenOffice.org originated as StarOffice, a proprietary office suite developed by German company StarDivision from 1985 on. In August 1999, StarDivision was acquired by Sun Microsystems for US$59.5 million, as it was supposedly cheaper than licensing Microsoft Office for 42,000 staff. On 19 July 2000, Sun Microsystems announced that it would make the source code of StarOffice available for download with the intention of building an open-source development community around the software and of providing a free and open alternative to Microsoft Office. The new project was known as OpenOffice.org, and the code was released as open source on 13 October 2000. OpenOffice.org became the standard office suite on Linux and spawned many derivative versions. It quickly became noteworthy competition to Microsoft Office, achieving 14% penetration in the large enterprise market by 2004. The project was accepted to the Apache Incubator on 13 June 2011, the Oracle code drop was imported on 29 August 2011, Apache OpenOffice 3.4 was released 8 May 2012 and Apache OpenOffice graduated as a top-level Apache project on 18 October 2012.

Component applications

Module		Notes
	**Writer**	A word processor analogous to Microsoft Word and WordPerfect.
	**Calc**	A spreadsheet analogous to Microsoft Excel and Lotus 1-2-3.
	**Impress**	A presentation program analogous to Microsoft PowerPoint and Apple Keynote. Can export presentations to Adobe Flash (SWF) files, allowing them to be played on any computer with a Flash player installed.
	**Draw**	A vector graphics editor comparable in features to the drawing functions in Microsoft Office.
	**Math**	A tool for creating and editing mathematical formulae, analogous to Microsoft Equation Editor. Formulae can be embedded inside other Apache OpenOffice documents, such as those created by Writer. It supports multiple fonts.
	**Base**	A database management program analogous to Microsoft Access. Base can function as a front-end to a number of different database systems, including Access databases (JET), ODBC data sources and MySQL/PostgreSQL. Native to the suite is a version of HSQL.

9. Conclusion

Recently open source softwares are becoming popular amongst millions of organizations and people. Open source software provides the user to make the modifications in the software as per their requirements. They are used by many people due to its lower cost, security, No Vendor 'Lock In', and Better Quality. Many people prefer open source software because they have more control over that kind of software. They can examine the code to make sure it's not doing anything they don't want it to do, and they can change parts of it they don't like. The distribution terms of open-source software must comply with 10 criteria given in the paper. Drupal is an open source content management platform powering millions of websites and

applications written in PHP. NewGenLib is an integrated library management system. Joomla is a free and open-source content management framework for publishing web content. Open office is office automation system software.

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A Decade of Digitization: *Lessons Learned*

Peggy Sue Ewanyshyn



The growing collection of materials digitized by University of Alberta Libraries (UAL) is widely-used for a variety of educational purposes (including post-secondary research and lifelong learning). This presentation will give the audience a view into the different types of digitization partnerships and projects underway at the UAL, with particular emphasis on the challenges that have been faced over time and what we have learned about such things as quality, readiness, and collaboration while building up our digitized collections. In addition, the presentation will bring to light some of the impacts of the materials being made available digitally.



E-resource management, Digitization,

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A model plan for a small functional rural library

Geeta Waman Nabar **Tara Ashok** **Bhanumurthy, K**

Abstract

In this paper a detailed proposal for setting up a small library at the village level has been drawn up. The library as an information node for the entire community women children farmer set up at the grass root level. Tackling the digital divide problem with a simple model plan will go a long way in bridging this gap. There are many such ICT initiatives which already exist but the model plan envisaged in this paper explores the scope of funding itself through a proposal to Raja Ram Mohan Roy foundation library. The possibility of raising the funds alternatively through NGO bodies and various National and regional library association is examined. The model drawn up is a simple one cutting out administrative hassle and paper work. The small functional library will serve other societal needs like an educational center, a health unit or an emergency shelter at times of natural calamities etc. Finally a few recommendations have been suggested which when adopted will make this model plan effective and viable.

Rural Library; Digital Divide; Information Node; Funding; Raja Ram Mohun Roy Library Foundation

1. Introduction

Education for all (United Nations, 2011) is an imitative that requires access to information and communication technology. Resources be it paper or electronic format come at a price which is one of the biggest challenges faced. Affordability and access are the two main criteria which determine a reach for information. The problems of this information divide can be addressed by tackling them at the grassroots levels. Along with the existing initiatives new solutions can be sought to reach information to the masses. This paper mainly aims at drawing a simple model plan and explores the possibility of funding itself by assistance provided by the Raja Ram Mohun Roy Library Foundation (RRRLF).

2. **Facts and Figures:** Firstly the facts with respect to of information accessibility numbers have been given below

   - While INTERNET in India has crossed the tipping point of 205 mn users in 2013 [IAMAI report (2013)], still only a modest 20 percent of urban Indians are connected. Worse only three percent of rural Indians are connected - as only 38 mn users in rural India have accessed internet to date (of the total 833 mn rural population)
   - Computers (PCs) penetration is under 10% (vs. +80% in North America or UK) and in rural India this is a scaring sub 1% .
   - As Indians, we have the second highest number of facebook users (more than population of Europe), but yet internet penetration across entire population is sub 10%
   - India is among the worst performing countries in the world for digital inclusion (Maplecroft report 2011).

3. **Existing initiatives:** There are in place several initiatives in India to address these problems the notable schemes are:

   - **The Village Knowledge Center The** effort supported by International Development Research Center (IDRC), Canada and Canadian International Development Agency (CIDA), Canada with a Partial support by Ford foundation, Government of Pondichery.

- **Gyandoot:** Gyandoot is basically a community-owned, technologically innovative and sustainable information-kiosk. This would perhaps be the most outstanding initiative by government to launch an e-governance platform.
- **The Simputer Project:** Scientists from IISc (Indian Institute of Science) and the Encore software brought this idea into practice. This project grew out of the dare need for an affordable access device for the rural population in the country. The Simputer is a low cost portable alternative top Cs, by which the benefits of IT can reach the common man.
- **Taarahat:** Is a project conceived by the Delhi based Development Alternatives group. The project provides a bunch of services like employment, mandi-market, e-mail, weather,matrimonial, etc. to the village community. The highly pasteurized interface makes it easier for a lay- man to use.
- **E- chaupal:** Within a span of four years, e-Choupal has already become the largest initiative among allllll Internet- based interventions in rural India. 'e- Choupal' provides servicesmore thanananann half a million farmers growing a range of crops - soyabean, coffee, wheat, rice, pulses etc., across four states (Madhya Pradesh, Karnataka, Andhra Pradesh and Uttar Pradesh.

4. Various e initiatives in Maharashtra

- **E-chavdi:** introduced by Government of Maharashtra on 1 Feb, 2013 is software to enable talathis to deliver computerized 7/12 extracts of land. The Stamps and Registration Software (www.mahaigr.org). The Stamps and Registration Department of a State is typically one of the top revenue earners for any Government. Stamp & Registration software provides efficient government citizen interface, and also enables enhanced revenue earnings for the Stamps and Registration operation. The heart of this application consists of the Registration and Valuation module.
- **SETU- A bridge for facilitation between Citizen & Government http://setu.maharastra.gov.in**

  Description: Harnessing the benefits of Information Technology for effective and transparent functioning of the administration is one of the core focus areas of the IT policy of the Government of Maharashtra. IT offers the possibility of making routine interactions faster, smoother and transparent. The Integrated Citizen Facilitation Centers (SETU) is an approach in this direction. At present there are multiple points of interaction between the citizen and individual departments spread over so many different Government offices. A one-stop service center for all such routine matters must be made available. The Integrated Citizen Facilitation Centers (SETU) is to work on these very basic needs of the citizens and reorienting our administrative processes accordingly. The aim is to lay the foundation for e-governance, create visible impact of the intention of the Government in this direction, and facilitate the interaction of the citizens with the Government to make it more transparent, pleasant and satisfying.
- To create foundation for citizen centric e-governance, at district headquarters & subsequently at taluk headquarters
- Single window clearance of 83 important certificates (includes renewal of leases, permits & licenses)
- Quick redressal of public grievances
- Common registry of letters, petitions for all sections of the office.
- On line pendency monitoring of all above
- To provide services after office hours & on holidays also in order to save Time, Money & Energy of the public.
- End Users/Beneficiaries: Populace

5. The Model Plan

The model which is formulated should be right one as it is pivotal to achieve the right aim. There are several initiatives which are currently in operation but still a lot of ground needs to be covered. In the present paper a simple plan for a small functional rural library has been drawn up and a proposal to seek funds through the various matching and non-matching Schemes of assistance of the Raja Rom Mohun Roy Library Foundation.

Plan Objectives

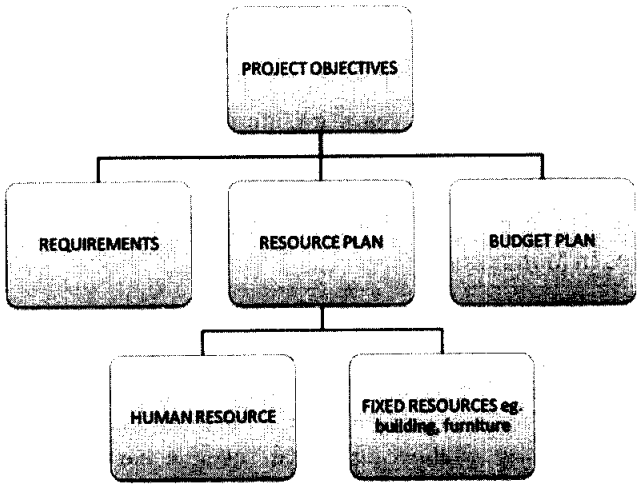


Figure - 1

6. Resource Plan

Table 1 - Human Resources

Requirements	Description	Remarks
Librarian	One	Qualified
Helper/Peon	One	Literate
Volunteers		

Table 2 - Fixed Resources

Requirements	Description	Remarks
Building	Concrete with public utilities Area 5000 sq ft with a playground	Land can be donated by the local panchayat
Furniture	10 cupboards	
	6 reading tables	
	chairs	
Xerox facility	1 unit	
Computer facility	12 computers	With broadband and wifi connectivity
Audiovisual equipment	One slide projector; 2 TVs with dish antenna	
Playground	Suitable equipment	
Toys	Educational	
Books	Children, Fiction and Vernacular Literature	

7. Budget

Table 3 - Budget

One time Expenditure	
Items	**Rupees**
Building	1000000.00
Furniture	300000.00
Computer facility 12 PCs	360000.00
Xerox Machine	75000.00
Audiovisual equipment	20000.00
Playground Facility	10000.00
Toys	10000.00
Books	200000.00
Total	1975000.00
Recurring expenditure (Monthly)	
Salary Librarian Peon	 10000.00 5000.00
Books and Magazines	20000.00
Maintanance	20000.00
Total	55000.00

Fixed deposit of Rs. 50 Lakhs would take care of the recurring expenses.

8. Funding

The Raja Ram Mohun Roy Library foundation as the source of assistance RRRLF is a central autonomous organization established and fully financed by the Ministry of Culture, Govt. of India as the nodal agency to develop Public Library System & Services in the country in collaboration with State Governments and Union Territory Administrations.

The below mentioned schemes offered for assistance by the foundation ie RRRLF can be tapped for financial assistance:

- Non-Matching Scheme Of Assistance Towards Establishment Of RRRLF Children Corner

  Title and Object:

  The Scheme is known as 'Non-Matching Scheme of Financial Assistance towards establishment of RRRLF Children corner'.

  The object of the scheme is to support and promote children's libraries/children section of general public libraries all over the country to attract the children to the library for development of reading habit, to equip children with life-long learning and literacy skills, enables them to participate and contribute to the community.

- Matching Scheme of Assistance towards purchase of storage materials, reading room furniture and library equipment like card cabinet, fire extinguisher, generator, water cooler etc. including photo copier.

  Title and Object

  The object of this matching scheme is to render assistance to the libraries in order to equip them with storage materials, reading room furniture and other library equipment. The scheme is known as "Matching Scheme of Assistance towards purchase of storage materials, reading room furniture and library equipment like card cabinet, fire extinguisher **Eco-friendly generator, Power back up system, water cooler** etc., including photo copier.

- Non-matching Scheme of Financial Assistance to Voluntary Organisation providing Public Library Services

Title and Object

This scheme will be known as 'Non-matching Scheme of Financial Assistance to Voluntary Organisations Providing Public Library Services".

The object of the scheme is to render financial assistance to voluntary organisations/institutions working in the field of public libraries for purchase of books, furniture and equipment, and also for construction, including additions of the building of the library wing of the organisation/institution.

9. Conclusions and recommendations

There are many initiatives and schemes whose efforts are directed towards bridging the digital divide. The model plan that this paper has drawn up is simple easy to implement without much requirement or involvement of government machinery. If every state having its own library associations takes upon itself to set up such libraries the imitative will succeed immensely. It will require more participation and understanding and also the truth that unequal education means lesser prospects in a world where in information age will only again more momentum. If they adopt the broad model and seek funding through RRRFL and set up a modest target of setting up about 6-12 such centers in the villages it will slowly but surely help in bridging the divide. Another source to tap will the NGOs and big corporate houses if the local library associations collaborate and take this scheme and raise the funding through them many more centers can be set up at the village level. As the scheme recommends holding a corpus fund from which recurring expenses can be met with the interest amount this makes the scheme a onetime investment and will roll on smoothly with no financial constraints. This is a good opportunity for the state library associations to foster a cause and also for volunteers and social services oriented citizens to participate. By implementing such a scheme the RRRFL funding scheme will also be put to a sound use and also ensure a right step towards literacy and filling the gap of digital divide. As mentioned in the abstract such a building can double up as a health centre, a community meeting point and as an emergency shelter during any natural calamity.

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Access and Use of Internet Resources by the Faculty Members and Research Scholars at Bishop Cladwell E-Resource Centre, Dravidian University, Kuppam, Chittor District, Andra Pradesh

Mothukuri Anjaiah

Abstract

The use of internet is now an essential for all academicians. Generally in university or College level, where research work is done. There should be must aware of recent or current research about their subject in the world. Internet is a reservoir of information. It is an outcome of changes in computer and communication technologies. The present study is an empirical study. The highlights of the study are, out of 95 respondents, majority 38 (40.00%) of the respondents browsing the internet resources from university library. A Majority 67 (70.52%) of the respondents were mostly using open access resources. A Majority of the respondents 83(87.36%) were using Google Search Engine, followed by the Yahoo 48(50.52%. A Large Majority 73(76.84%) of the respondents using the internet for sending e-mails, chatting and visiting the social sites for sharing views or information, followed by 54 (54.84%) respondents for downloading the reading material, 47(45.47%) respondents were using the internet for applying the jobs, filling the online applications) and 42 (44.25%) faculty, research scholars were using the internet for teaching as well as research work.

Internet resources, search engines, Knowledge Centers, Digital Library

1. Introduction

The Internet is a major source of communication and dissemination of information in the twenty-first century. The Internet has now-a-days become an important component in academic institutions as it plays a pivotal role in meeting the information and communication needs of institutions. As a powerful and dynamic tool for communication, it is the largest single source of information at the global level. The library and information landscape has transformed with the onset of the digital era and today traditional libraries have changed their roles to serve as 'Knowledge Centers' with priority on value added electronic information services. The use of Internet and the power of search engines have changed the role of libraries and its services radically. Internet is a store house of information. It is an outcome of changes in computer and communication technologies.

2. Growth of Electronic Resources

The most rapidly changing pervasive and publicized aspects of library and information studies are the electronic resources. In a relatively short period of the time, Electronic resource have expanded from a few dozen computerized bibliographies databases to include the over whelming information available on the Internet use of Electronic resource has moved from accessing online databases with a dumb terminal to surfing the world wide web with a high speed multimedia personal computer that has more power than the early main frame computers.

The complexity of electronic resource has grown to comprise of library online catalogue list of CD-Rom, online journals, database, newspapers, reference materials open access journals, e-books, major publishers and online bookshops amounting to the Electronic resource is not easy, or so it appears, at the same time there is a pressing need for guidance in the use of such resources.

3. Availability e-Resources on Internet

Internet is called as 'Treasury of Knowledge' or 'Reservoir of Knowledge'. Internet has many resources that can be harnessed by academics for quality scholarly research work. These includes-- E-Books,

E-Journals, Databases, ETDs, E-News Papers, E-Content, E-References, E-Articles, Directories, Search Engines, Information Gateways, WWW, Wikipedia and Open Access Resources (OAR), Technical Reports, and E-Seminar/Conference Proceedings,UGC-Infonet E-Journals Digital Library Consortium, INDEST- AICTE Consortium, CSIR Consortium and OPAC/WEBOPAC.

4. Digital Library

The digital library is consisting of 33 computer systems with internet connectivity with BSNL bandwidth. It is maintained by the library assistant and he is directly responsible to head of the department. The entry is restricted to library members, university teachers, contact lectures, project fellows, non-teaching and administrative staff will be allowed to use the Internet facility. Free entry to all members or staff of the university. Every member will be given one hour time to use internet.

5. Review of Related Literature

In any field of study, the existing literature constitutes a base on which all further research is carried out. The Encyclopedia of Educational Research says that the related literature helps the researcher to highlight the studies and their findings related to the problem undertaken for research. The researcher feels that there is a need for review of literature, which has some relation to the relevant area and considers the most important pre-requisite to actual planning and conducting the study.

Therefore, the researcher made an elaborate review of the research material available on the subject. A review of literature reveals that there are a large number of literatures available on the use and awareness of the internet. The present study is an attempt to clearly establish and exhibit the present status of internet resources, services and awareness in the Dravidian University Library, Dravidian Unversity.Kuppam.

Madhusudan, M (2007)**1** in his article *"Internet Use by Research Scholars in University of Delhi"* said that most of the research scholars used search engines more than subject gateways or web directories in order to locate information on the internet. Maheswarappa & Emmanuel (2003)**2** in their study entitled *"Use of Internet Resources and Services in Gulbarga University: An Explanatory Study"* found that all the users have computer knowledge and they are using internet resources frequently for their research and study.Chandran, D (2000)**3** Conducted a Survey *on "Use of Internet Resources and Services in SV Univerity-Tirupati".* The survey carry out that use of internet resources and services are very essential. In any field of study, the existing literature constitutes a base on which all further research is carried out.

The Encyclopedia of Educational Research says that the related literature helps the researcher to highlight the studies and their findings related to the problem undertaken for research. The researcher feels that there is a need for review of literature, which has some relation to the relevant area and considers the most important pre-requisite to actual planning and conducting the study.

6. Objectives

- To examine the awareness of the respondents on Internet
- To know the purpose and use of internet by the faculty and research scholars
- To know the availability of the Internet Resources
- To know the problems faced by the faculty, researchers and students
- To find out the satisfaction level with the internet based resources
- To provide constructive suggestions based on the present study

7. Hypotheses

- Internet is very essential to the academic community.
- Internet resources are very essential for faculty as well as research scholars for to complete their academic and research work.
- Faculty members and research scholars are utilizing the internet resources
- Faculty Members and Research Scholars are facing many problems while searching the internet resources.

8. Methodology

To conduct the study, survey method is adopted and questionnaire used as a tool for data collection. A well structured questionnaire was designed scientifically keeping in view of the objectives. The questionnaires were distributed to the Faculty Members and Research Scholars to a sample for 125. However, 95 (76.00%) valid questionnaires of them responded and the same used for analysis.

9. Data Analysis and Discussion

Analysis of data is the ultimate step in research process. It is the link between raw data and significant results leading to conclusions. This process of analysis has to be result oriented. The questionnaires were distributed and collected from the respondents and collected data is presented in Table 1.

Table 1: Distribution of Questionnaires

Academic Status of Respondents	No. of Questionnaires Distribution	%	No. of Questionnaires Received	%
Faculty Members	50	40	35	28
Research Scholars	75	60	60	48
Total	**125**	**(100%)**	**95**	**(76%)**

Table 1 depicts that a total of 125 questionnaires were distributed to the respondents belongs to faculty members and research scholars of Dravidian University using simple random sampling technique to which 95 responded, which amounts to **76.00** per cent of response rate.

Gender-Wise Distribution of Respondents: A question has been put to the respondents to know the status of gender. The replies are analyzed and presented in the given Table 2.

Table 2: Gender -Wise Distribution of Respondents

Academic Status of Respondents	Male	%	Female	%	Total	%
Faculty Members	22	23.15	13	13.68	35	36.84
Research Scholars	38	40.00	22	23.15	60	63.15
Total	**60**	**63.15**	**35**	**36.84**	**95**	**100.00**

Table 2 shows that the Gender-Wise distribution of respondents. Out of 95 respondents, 38 (63.15%) respondents are male and 35 (36.84%) are female. It is clearly shows that the male respondents are higher than the female respondents.

Residence-Wise Distribution of the Respondents: A question has been put to the respondents to know the status of the residence. The replies are analyzed and presented in the given Table 3

Table 3: Residential Status of the Respondents

S.no.	Academic Status of Respondents	Rural	%	Urban	%	Total	%
1	Faculty Members	28	29.47	07	7.36	35	36.84
2	Research Scholars	45	47.36	25	37.89	60	63.15
4	**Total**	**73**	**76.84**	**32**	**33.68**	**95**	**100.00**

The above **Table (3)** reveals that the majority 73 (76.84%) of the respondents belongs to rural areas, followed by, 32 (33.68%) respondents belongs to urban area. It is evident from the above table that the most of the respondents ***i.e.*** faculty members, research scholars belong to the rural areas.

Table 4: Age-Wise Distribution of Respondents

Age of the Respondents	Faculty Members	%	Research Scholars	%	Total	%
21-25 years	12	12.63	41	43.15	53	55.78
26-30years	13	13.68	11	11.57	24	25.26
31-35 years	03	3.15	04	4.21	07	7.36
36-40	04	4.21	02	2.10	06	6.31
41-45	02	2.10	01	1.05	03	3.15
46 & above years	01	1.05	01	1.05	02	2.10
Total	**35**	**36.84**	**60**	**63.15**	**95**	**100.00**

Data presented in the above (Table No.4) belongs to the age-wise respondents. It is found that a majority 53(55.78%) of the respondents were in the age group between 21-25 years, followed by 24 (25.26between 26-30 years, 7 (7.36%) between 31-35 years, 6 (6.31%) between 36-40 years, 3 (3.15%) between 41-45 years and 46 above years 2(2.10%). It is clearly shows that the respondents' ages between 21-25 years were pursuing the higher education in India. It is a good sign of younger generation to serve to the development of our nation as quoted by **Swamy Vivekananda.**

Table 5: Frequency of the Library Visiting

Frequency	Faculty Members	Research scholars	Total
Daily	8	38	46 (48.42)
Once in a Week	11	8	19 (20.00)
Fortnightly	7	9	16 (16.84)
Monthly	9	5	14 (14.73)
Total	**35**	**60**	**95 (100.00)**

The above table 5 explains about the frequency of visiting the university library. Out of 95, A majority 46 (48.42%) respondents are visiting the university library daily, followed by 19 (20.00%) respondents visit the library once in a week, 16 (16.84%) respondents were visiting library fortnightly and 14 (14.73 %) respondents monthly visits the library.

It is pertinent to note that a large majority of the respondents ***i.e.*** faculty, research scholars and students are visiting the university library once in a week to use the library resources and e-resources for their academic use, which is very essential to complete their academic programmes within the course duration.

Table 6: Location of Internet Browsing

Place of Internet Browsing	Faculty Members	Research Scholars	Total & %
Library	03 (3.15)	35 (36.84)	38(40.00)
Department	22 (23.15)	03 (3.15)	25(26.31)
Computer Center in Campus	02 (2.10)	07 (7.36)	09(9.47)
Cyber Café	02 (2.10)	08 (8.42)	10(10.52)
Home	06 (6.31)	07 (7.36)	13(13.68)
Total	**35 (36.84)**	**60 (63.15)**	**95 (100.00)**

(Parenthesis indicates percentage)

The table (6) depicts that the location of the internet. Out of 95, Majority 38(40.00%) respondents browsing internet from university library for getting needed e-resources, followed by 10 (10.52%) respondents browsing the internet from Cyber Café, 25 (26.31) were from the departments, 9 (9.47%) from university computer center and 13 (13.68%) respondents were browsing the internet from their home. This table also shows that the majority of the faculty members 25 (26.31%) are browsing internet for e-resources from their respective departments and a large majority of the students 35 (40.00%) are browsing the internet for getting the e-resources from the library. It shows that the importance of the Internet facility in the university library.

Table 7: Purpose of Internet Browsing

Purpose of Internet Browsing	Faculty Members	Research Scholars	Total	%
For Teaching & Research	27	15	42	44.21
For Writing Articles/Books/Chapters	11	22	33	34.73
For Getting Reading Material	03	51	54	54.84
For Preparing the Project Reports	05	52	57	60.00
For Applying Jobs/Filling the Online Applications	02	45	47	49.47
E-mails/Chatting/Social Sites	25	48	73	76.84

(Note: Multiple Answers asked)

The above Table (7) explains the purpose of using the internet. Majority 73 (76.84%) of the respondents using the internet for sending e-malis, chating and visiting the social sites for sharing the views/information, followed by 54 (54.84%) respondents for downloading the reading material, 47 (49.47%) respondents for applying jobs, filling the online admission applications forms, 57 (60.00%) respondents for preparing the project works, 42(44.21%) and 33 (34.73%) respondents using the internet for teaching, research and writing articles, chapters in books respectively. On the whole, all the faculty members, research scholars and students were using the Internet academic purpose. It is a good sign for study and research. The above table also explains that majority of the faculty members browsing internet for teaching, research and writing articles as well as books, students and research scholars were using the internet for reading material and preparing the project works.

Table 8: Access and Use of Internet Resources

Access & Use of Internet Resources	Faculty Members	Research Scholars	Total	Percentage
E-Journals/ E-Books	21	28	49	51.57
E-databases	32	15	47	49.47
E-Articles	29	17	46	48.42
E-Conference Proceedings	12	09	21	22.10
Wikipedia	**23**	**45**	**68**	**71.57**
Open Access Recourses	**31**	**41**	**67**	**70.52**
Institutional Repositories	15	13	28	29.47
E-Theses/ETD	33	26	59	62.10
UGC-Infonet E-Journals Consortium	17	11	28	29.47

(Note: Multiple Answers were asked).

Table **8** explains regarding to accessing and using the e-resources from the Internet by the respondents. Majority 68 (71.57%) respondents using Wikipedia for getting the needed information from the Internet, 67(70.52%) for Open Access Resources, 59(62.10%) respondents were using e-theses/ETDs, 21(22.10%) e-conference proceedings, 49(54.2851.57%) for e-Journals and e-books, 46(48.42%) for e-articles using the internet by respondents. 28(29.47%) respondents are using UGC-Infonet E-Journals and Institutional Repositories 28(29.47%) used by faculty and research scholars also 47(47.47%) respondents using the databases in their research activity.Total faculty members and research scholars i.e.95 (100.00%) users were using the internet recourses for their teaching, research and other academic activity. It is a good sign for nation development.

Table 9: Ways of Internet Browsing

Ways of Internet Browsing	Faculty Members	Research Scholars	Total	%
Web Sites	33	55	88	92.63
Subject Gateways	27	15	42	44.21
Search Engines	31	48	79	83.15

(Note: Multiple Answers asked)

The above table (9) indicates that the majority of respondents, Out of 95 respondents, 88 (92.63%) browsing the internet by using web sites for getting the e-resources from Internet, 79(83.15%) were use the Search Engines and 42 (44.21%) of the respondents through subject gateways, and for accessing the required information on the internet. It shows that the respondents were using the search engines, web sited and subject gateways for access the e-information from Internet. It also shows that digital literacy is more among the respondents of Dravidian University even though is is located at remote place in Andra Pradesh.

Table 10: Access and Use of Search Engines

Nature of Search Engines	Faculty Members	Research Scholars	TOTAL	Percentage
Google	**28**	**55**	**83**	**87.36**
Yahoo	15	33	**48**	**50.52**
Alta Vista	2	5	07	7.36
MSN	7	3	10	10.52
Khoj	2	2	04	4.21
Hotbox	5	--	05	5.26
Bing	10	7	17	17.89

Table (10) shows that to obtain the information from the internet, search engines are main tools as desired by the respondents. Google Search Engine was the most popular search engine with 83 (87.36 per

cent), followed by the Yahoo 48 (50.52%), followed by Bing 17 (17.89%) and MSN 10 (10.52%), Alta Vista 7 (7.36%) y. It is clearly indicates that the Google is dominating in providing information on the Internet. Khoj and Hotbox search engines were 5.26% and 4.21% used by respondents. Hot Box used only faculty members.This shows the "Google" is the most popular search engine among other search engines which are mentioned in the above table. As we know well, world wide also using Google Search Engine to obtain needed information from the internet.

Table 11: Problems Faced by the Respondents while Accessing Internet Resources

Problems Faced by the Respondents	Faculty Members	Research Scholars	Total	%
Lack of knowledge in Computer Handling	---	15	15	15.78
Lack of knowledge in browsing-Resources	---	22	22	23.15
Limitation /Slow of Internet Access Speed	**05**	**55**	**60**	**63.15**
Limited Online Full-Text Journals Articles	**11**	**47**	**58**	**61.05**
Frequently Power Off	05	52	57	60.00
Limited Computer Terminals	05	33	38	40.00
Lack of ICT Skilled Library Staff	08	46	54	56.84
Facing Downloading Problems	03	40	43	45.26
Difficulties in Finding relevant Information	--	48	48	50.52
Lack of Printout Facilities	**08**	**60**	**68**	**71.57**

(Note: Multiple Answers asked)

The above table (11) reveals that the problems faced by the majority respondents while using the internet browsing. Majority 68 (71.57%) of the respondents are facing printing facility problem in university library, which is not available in the Internet center, followed by, 92 (87.61%) respondents opined that frequently power off, 58 (61.05%) respondents were not finding the online full-text journals articles, 43 (45.26%) respondents were facing downloading problem, 38 (44.00%) respondents were said that the limited computer terminals available in the library. 60(63.15%) of the respondents were also opined that the slow bandwidth of internet access speed, 15(15.78%) respondents having lack of knowledge in browsing e-resources, 22 (23.15 %) respondents lack of knowledge in computer and 54 (56.84%) respondents opined that the staff of the library not having the ICT skills.

The above indicates that there is need to ICT training for library staff to provide necessary information to the faculty and research scholars.

Users Satisfaction on Internet Resources:

The user satisfaction is most important factor for any library. It all depends on identification of user needs and fulfillment then with at most care .In this regard; the users were requested to indicate their level of Satisfaction towards the Internet Resources. A question has been put to the respondents to know the satisfaction of users on the availability of Internet Resources in the library. The replies are analyzed and presented in the given Table 12.

Table 12: Satisfaction on Internet Resources

Academic Status of the Respondents	Satisfied	Highly Satisfied	Partially Satisfied
Faculty Members	2	3	3
Research Scholars	23	8	29
Total	**25 (42.37%)**	**11 (18.64%)**	**23 (38.98%)**

The above table (12) shows that the majority 25 (42.37%) of the respondents felt satisfied with the availability of Internet resources, 23 (38.98%) percentage of the respondents also partially satisfied with the existing resources, followed by, 11 (18.64%) respondents highly satisfied with the interne resources. It is clear that the Internet Resources are very useful, needful to faculty members, research scholars.

Parameshwar, S & DB Patil (2010) found in their study that use of internet resources play a pivotal role in higher education at the global level.

10. Major Finding of the Study:

- Majority 60 (63.15%) of the respondents belongs to male and 35 (36.84%) are female.
- Majority 73 (76.84%) of the respondents belongs to the rural areas and 32(33.68%) respondents belongs to urban area. It is evident that most of the respondents ***i.e.*** faculty members, research scholars and students belongs to rural area. This University also belongs to remote rural area.
- Majority 53(55.78 %) of the respondents were in the age group between 21-25 years.
- Out of 95 respondents, a majority 46(48.42%) respondents are visiting the university library daily, followed by 19 (20.00%) respondents visit the library once in a week.
- Out of 95, majority 38 (40.00%) respondents were browsing the internet resources from university library, followed by 8 (8.42%) respondents browsing the internet resources from Cyber Café
- A large majority 73 (76.84%) of the respondents using the internet for sending e-mails, chatting and visiting the social sites for sharing the views/information, followed by 92 (87.61%) respondents for downloading the reading material, 54 (54.84%) respondents were using the internet for applying the jobs, filling the online applications and for preparation of project work 57(60.00%) respondents both faculty, research scholars using the internet resources, 42 (44.25%) respondents were using the internet for teaching and research work.
- A Large Majority 97(92.38%) of the respondents are accessing and using search engines for obtaining e-resources from Internet and 68 (71.57%) respondents using Wikipedia for getting the e-information from Internet of the university library.
- A Majority of the respondents were using the Google Search Engine, which is the most popular search engine with 83 (87.36% %, followed by the Yahoo 48 (50.52%)
- Majority 68 (71.57%) of the respondents were facing printing facility problem at university library, which the facility is not available, followed by, 60 (63.15%) respondents opined that frequently power off, slow speed and 58 (61.05%) respondents were not finding the online full-text journals articles.
- Majority 67 (70.52%) of the respondents were using open access resources.
- All most all the respondents expecting the digital services such as , e-reference service, SMS Service/Alert, e-books/e-journals, e-clippings, OPAC/Web OPAC, etc. from the university library.
- 11(18.69%) respondents were highly satisfied with the existing facilities, 25(42.37%) were satisfied.

11. Suggestions:

- E-resources such as E-Books, E-Journals and E-Articles procured by the library which are most useful to the all the faculty members, research scholars and students.
- The University authorities should be taken immediate steps for strengthening the Digital Library for getting more internet resources.
- Printing Facility should be provided to the users.
- More Full-Text Journals and databases should be provided.
- E-Services. E-Clipping facility also introduce in the university library.
- The Inverter (UPS) facility also provides to avoid the frequently power off.
- There is urgent need to conduct seminars, conferences/Symposia and On-Hand Works-Shops on E-Resources, E-Services, E-Information, Digital Libraries and Open Educational Resources (OER), Courseware, accessing and using the OPAC, Web OPAC to the respondents for their study and research.

12. Conclusion

Internet is a global system of interconnected computer networks that free floe of information by pocket switching using the standardized internet protocol suite. The internet is considered as the electronic mobile library in cyberspace provides an almost universal infrastructure for accessing the information with almost global reach. The Internet is composed of a large number of smaller interconnected networks called internets. These internets may connect tens, hundreds, or thousands of computers, enabling them to share information with each other and to share various resources, such as powerful supercomputers and databases of information. The emergence of the internet and e-resources particularly the World Wide Web, as a new medium of information storage and delivery represents a revolution, which will have a lasting impact on the publishing and information delivery system in the twenty-first century. Increasing numbers of publishers - both commercial and private, as well as individuals are using the internet as a global means to offer their publications and writings to the international community of scientists and technologists, as well as students.

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Application of Information and Commutation and Technology in Engineering College Libraries: *A Case Study of Engineering College Libraries of Jaipur District, Rajasthan*

Bhoop Singh **Dinesh Kumar**



The paper described the actual condition of engineering college libraries in Information and Communication Technology in Jaipur districts of Rajasthan state. Present era in information era and role of libraries are increased day to day. Libraries are provided various services as with help of Information of Communication Technology. In this paper tried to evaluate the users' attitude, awareness and satisfaction related to library services in being provided with the support of ICT. The data collected with the help of questionnaire have been interpreted and output results have given in this paper.



Information, Communication, Technology, ICT, Engineering College.

1. Introduction

Growth of information and communication technology during the last few years has been phenomenal. It has been implementing on early sort of human life. During these years of growth and popularity of ICT, numerous different featured and facilities have been developed and marketed. Due to the growth of information explosion, its use become so wide spread, there is a great need of applying certain technology to retrieval and dissemination of information quickly and easily. Information and communication technology or information technology is the technology required for information processing. In particular in the use of electronic and computer software to convert, state, protect process, transmit and retrieve information from anywhere, any time. Information and commutation technology ban be used in libraries and information centers for the development of new information services and computerization of library services. ICT is use full for libraries in a great extend. It is improving productivity and efficiency of library service effectively.

2. Engineering Education and Engineering College Libraries

India can be traced back to mid 19th century, although it got momentum in 20th century with the set up of constitution of technical education committee on the Central University Board of Education (CABE) in 1943, and formation of All India Council of Technical Education (AICTE) which was established in November 1945 first as an advisory power in India and later on in 1987 given statutory status by an Act of Parliament. Though, the basic thrust of development planning was on growth in first few decades after independence, but the globalization of the education system has led the establishment of various universities and institutes of higher education in the recent years.

3. Overview of Engineering Education in Rajasthan

Initially, Rajasthan was lacking in Engineering Education and there were only few options for the students to take admission in compared to other states. Some of years ago only Govt engineering colleges have in Rajasthan ,MBM Govt. Engineering college, Jodhpur (1951), Govt Engineering College, Kota (1981) now under the Rajasthan Technical University, Malviya Regional engineering college (1963)(Presently Malviya National Institute of Technology) Jaipur, College of Technology and Engineering (1964) under Maharana Pratap University of Agriculture and Technology) were only option to students and Banasthali University,Banasthali (1945),Birla Institute of Technology and Science, Pilani (June 1964), Jain Vishva Bharti University, Ladnun (1991) and Modi Institute of Technology and Science (1989) were deemed University that provided technical education in Rajasthan.

Now days Govt of Rajasthan has focused its policies to provide engineering and Technical education in Rajasthan. So that presently there is 135 engineering colleges in Rajasthan. These colleges are approved by AICTE and affiliated with Rajasthan Technical University, Kota. Out of these colleges some of running the first and 2nd shift with morning shift in Rajasthan, if we compare district wise engineering colleges of Rajasthan, Rajasthan's capital Jaipur have 50 colleges in city. All these are self finance engineering colleges. Out of these **50** colleges three of them are only for girls engineering colleges. In Ajmer **6**,one Govt women and one govt co-engineering college, Udaipur **13**, including one govt college, Jodhpur **10** including one govt and one girls private engineering college, Bikaner **4** including 2 govt autonomous college, Alwar **9** including one girls engineering college,Kota **6** including one govt engineering college, Sikar **3**,Jhunjhunu **5**,Dausa **3**,Jhalawar **one** Govt Engineering college,Bharatpur **2** including one govt college,Bhilwada **2** including one Govt textiles College,expet this bundi **1**,Sri Ganganagar **2**,sirohi **2**,Rajsamand **2**,Chittodgarh **1**,Dungarpur **1**,Nagore **1**,Tonk **1**,Pali **1** and Pratapgath **1** and Hanuman Garh **1** colleges in Rajasthan.

Apart from them Govt. of Rajasthan has allowed to run some Self financed University campus also through Rajasthan Self-Financed Private Universities Ordinance, 2004. Some of Universities have formed and developed their campus and some of are in pipeline. Presently 15 universities are govt sector including Agriculture, Technical, Ayurveda, Sanskrit, Law, Science and Technology, Health Science and Homeopathic stream in Rajasthan,8 universities are running with deemed university status and another17 universities are running in private sector.

4. Need the study

Related to ICT already been many studies on the Information and Communication Technology application in academic, engineering and medical libraries in India. In Jaipur district no work has been done yet. The Jaipur id capital of Rajasthan state and mostly colleges are established after the year of 199--2000. Before 1999 only one Malviya regional Engineering College (Presently Malviya National Institute of Technology). Various problems faced by the uses of engineering college library in modern information and ICT era.

5. Limitation of the study

The present study, application of information and communication technology covered only randomly selected 25 engineering colleges of Jaipur district, Rajasthan State. In the Jaipur district have 50 engineering colleges but study has limited to 25 engineering colleges libraries only. The study was not included self financed university, MNIT, medical and other institute located in the Jaipur district.

6. Aims and objective of the study

To find the status of application of information and communication technology in engineering college library the aims and objective of the study are followings.

1. To find out level of information technology bases facilitates available.
2. To find out IT bases services.
3. To find out IT base resources in engineering college libraries.
4. To find out of level of users satisfaction.
5. To find out problem faced by uses
6. To find out the user awareness.

7. Research methodology adopted:

The stratified random sampling technique was used to collect the data from population. The present study includes 250 responded using engineering college libraries drawn from twenty five main and famous

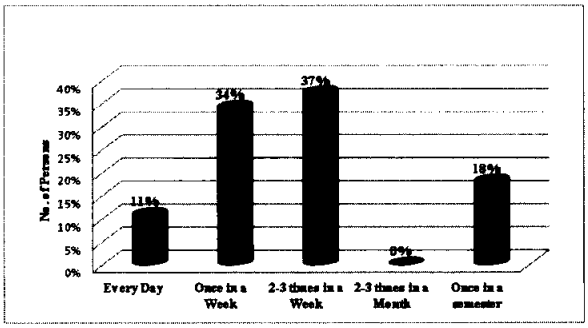
engineering college of Jaipur. All selected Colleges are affiliated to Rajasthan Technical University, Kota, Rajasthan

To elicit the opinion of the respondents for found status of application and information and commutation technology in engineering college libraries, the questionnaire comprising of 17 questions was designed. The questionnaire was distributed to respondents as per the objective of the present study. Questionnaire has been distributed 300 engineering college library users. Which are students of engineering of various field (e.g. mechanical engineering, electrical engineering, Electronics and commutation Engineering, Civil Engineering, Computer Science Engineering, Information Technology etc.). The respondents were requested them to fill the questionnaire as per their convenience and returned the questionnaire to the investigator. The filled up questionnaire have been collected from the respondents for the data analyses and interpretation. The collated data has been tabulated and in the present paper results have been shown in the tabular and graphical format. As the investigator have approached the library users personally, response rate is significantly and light

8. Data Analysis:

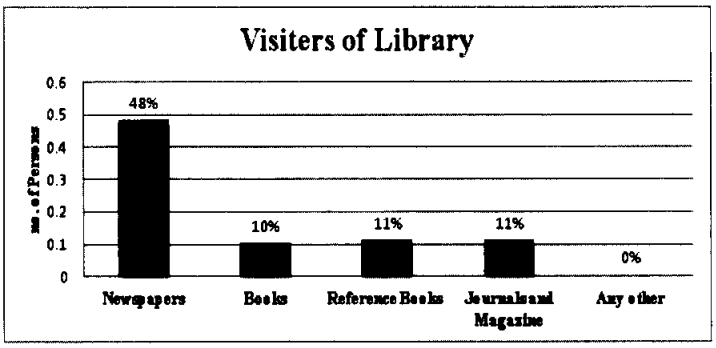
300 questionnaires were distributed among the users of engineering college libraries of Jaipur. The responded rate was 83.33% mean 250 filled questionnaires received back. It was a good response suitable for healthy results. Main areas covered in the questionnaire are shown in the following charts/graphs and tables as.

Figure no. 1 - **How many times do you visit the Library?**



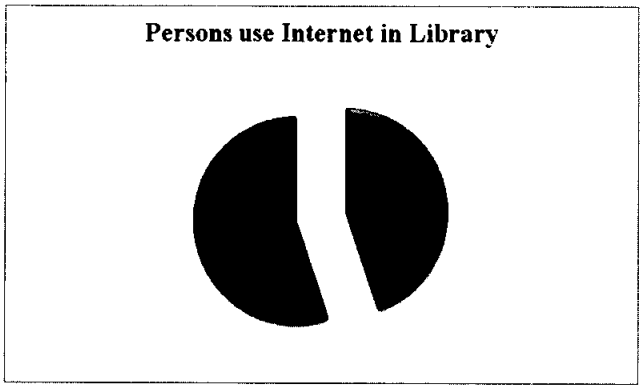
The result of figure no.1 is important result of the study because it is show that how many times of engineering and technology students does visit in the library. The result shoe that out of 250 students, 11% visited every day, highest 34% come to library once a week. 18% students visited the library once in semester also.

Figure No. 2 Purpose of Visit of Library



The reveals of the Figure no. 2 shown the purpose of the visit of engineering college Libraries. Out of 250 users, 120 (48%) are visited to library only reading for newspaper .Only 10% students are visiting for books and reference books and Journals and magazine.

Figure No. 3 Are you use Internet in Library



The data analysis of figure no. 3 shown that out of 250 respondents, 112 (45%) respondents are use internet in Library.55% respondents are not use internet in Library.

Figure No. 4 If yes what kind of Electronics Resources have you accessed.

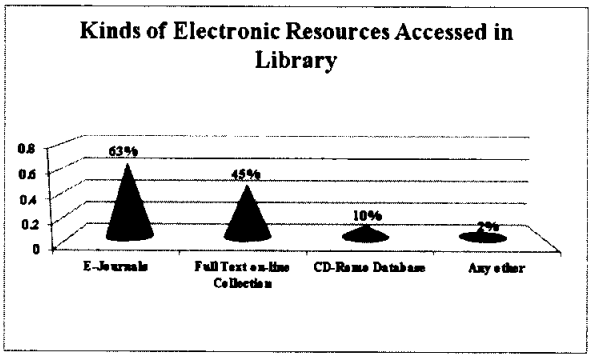
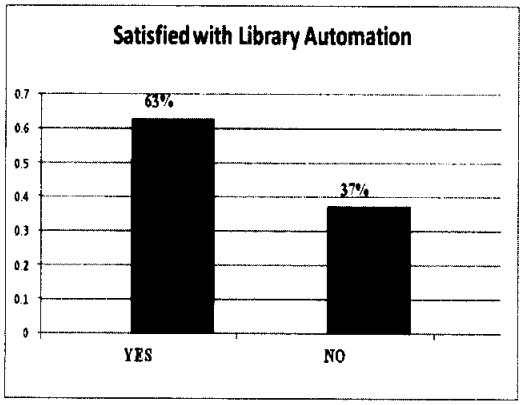


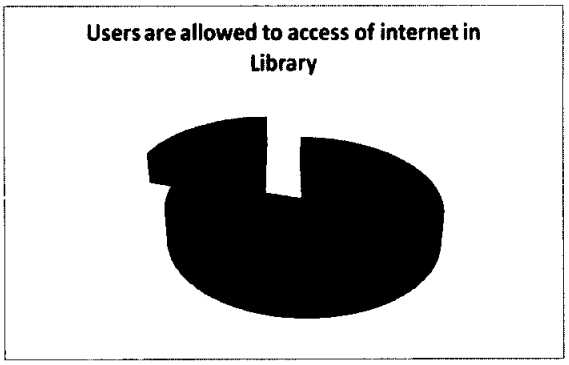
Figure no. 4 shown the awareness of the users of engineering college library. Out of 250 respondents 63% are use E-journals and 45% are full text online collection in the Library. Today Library services are ICT base so 10% respondents also use CD Rome database also.

Figure No. 5 Are you satisfied with Library Automation



The analysis of Figure no.5 showed the Main requirement of Library, Library automation. Today for providing better and fast services of library, library automation should must in every library. Mostly libraries have automation of their libraries for day to day working but As per the result of the study only 63% respondents satisfied with library automation.

Figure No. 6 if yes, have you allowed to access of internet in Library.



Result of Figure no. 6 shown the users allowed to access of internet in Library. Out of 250 respondents, 200 (80%) are agree that library allow to access facility of the internet use in Library. Another side 50 respondents are not agreeing with this question.

Figure No. 7 How many users are satisfied with no. of Computer

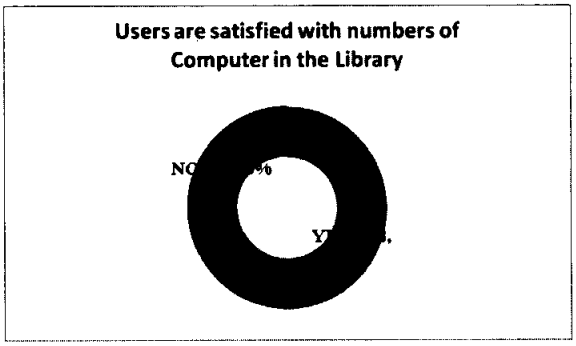
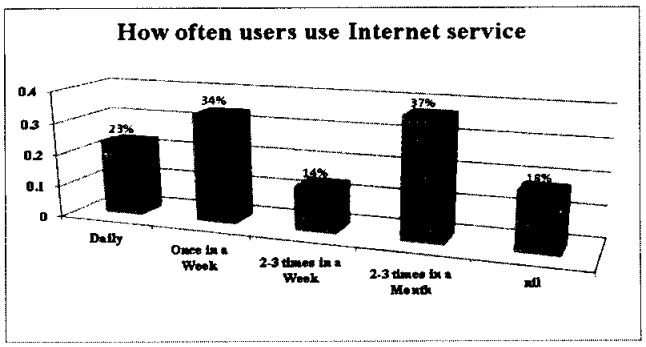


Figure no. 7 shown the satisfaction of respondents with availability of Computer hardware and software in the library. As per AICTE/UGC norms minimum 10 multimedia

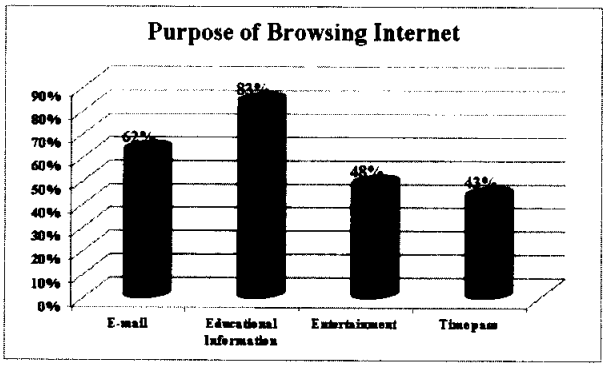
PC should be must in the Library but as per study that only 67% respondents are satisfied with the availability of Multimedia PC's, Internet speed and other hardware and software required for the internet and other use, but still are makeable33% respondents claim that the availability of computers is not enough.

Figure No. 8 how often do you use Internet service



Today internet is the most useful and commonly used technology with respondents. As per the result of the study shown in above graph no. 8, 23% Students of engineering college are used internet daily, 34% once in a week and highest 37% are used 2-3 times in a Month.

Figure No. 9 Purpose of Browsing Internet.



For the purpose of browsing internet in the library result of study show that 83% students are use internet in the library for educational information like download RTU syllabus, search competition exam information, Lectures, Note, PPT, Old question papers, fill form of online exams and other education and studied related information. 62% respondents are use internet for e-mail purpose only in library. With this 48% use internet for entertainment and 43% for time only.

Figure No. 10 Do you feel satisfied with Library Internet services?

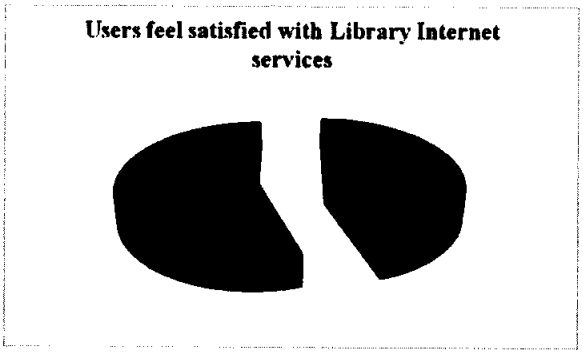
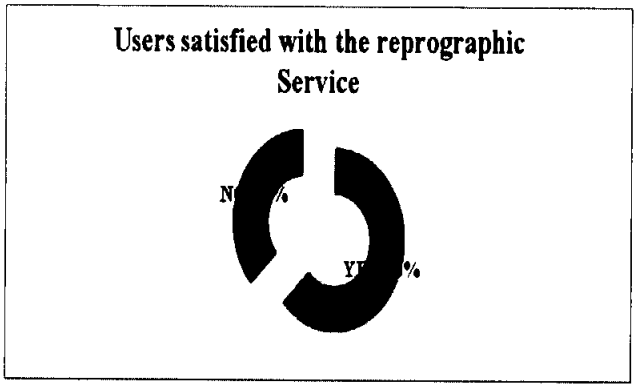


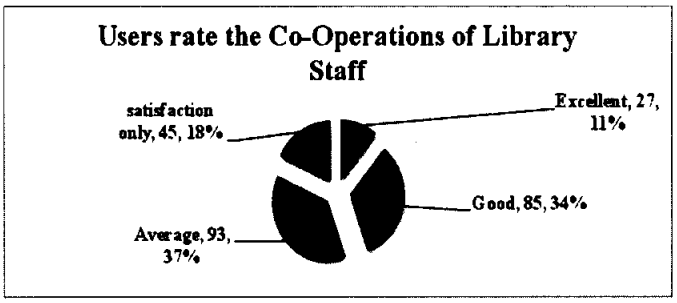
Figure no. 10 shown that only 45% respondents are satisfied with the Internet services of the libraries. It is urgent need to improve the internet facility of engineering college libraries, because 55% students are not satisfied with these services.

Figure No. 11 Are you satisfied with the reprographic Service.



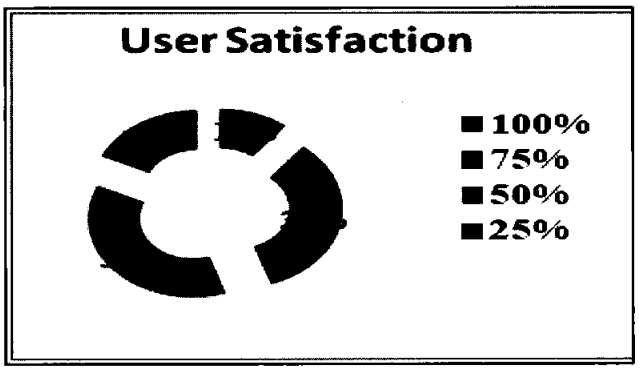
As per AICTE/UGC norms every engineering College libraries have reprographic facility compulsory. Data analysis in above graph shown that 63% respondents are satisfied with photocopies facilities.37% respondents are not satisfies due high rate of photo copy charge and long queue at time of photocopies.

Figure No. 12 How do you rate the Co-Operations of Library Staff



For providing good services of the library, role and responsibilities of Librarian is important. Figure no. 12 has shown the cooperation of Library staff that out of 250, 27 (11%) is excellent, 34% is good, 37% is average and 18% is satisfaction only.

Figure No. 13 How are you satisfied with the Library Services



Analysis of above graph No. 13 has shown that 11% respondents are 100% satisfied with library services, 34% users are 75%.The 25 % satisfaction level also in the 25% users.

Figure No. 14 Are you wanted to give following suggestions?

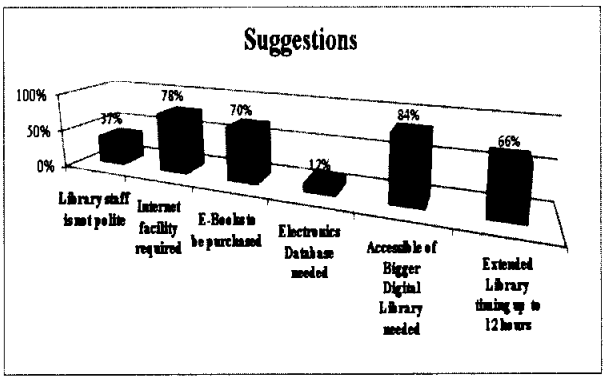
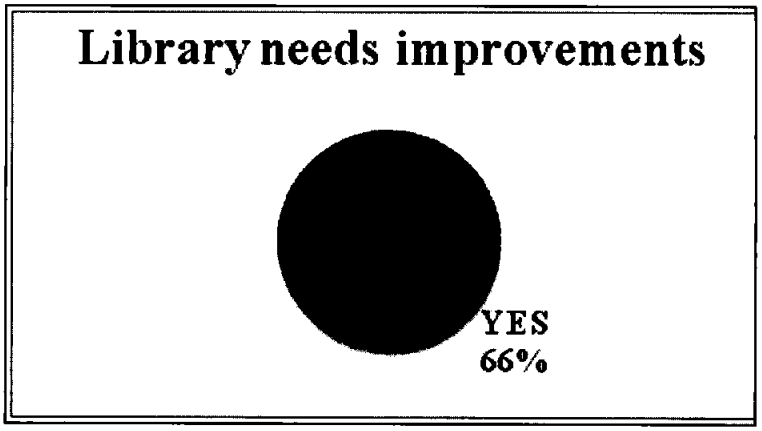


Figure no. 14 reveled that as per need of modern times and required during studies students want to bigger digital library for accessible. Out of 250, 210 (84%) students want to digital Library. 78% students of engineering colleges want to good internet facility with high speed.37% staff want reforms of library staff.70% respondents are want to purchased e-books for studies and only 12% students have want to electronics database.

Figure No. 15 Do you recommend any other suggestion for the improvement of your Library.



The figure no. 15 has shown the result of suggestions of the user for improvement of Library. Mostly students

9. **Conclusion & Suggestions:** - the study is related to engineering college library application of ICT in engineering college libraries. It is suggested that college should provide best infrastructure of information and communication technology for best use of internet, access of e-resources, e-books, e-journals in the library so that the uses can use useful library services of internet effectively.

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Availability and Use of ICT in Engineering College Libraries of Sonepat, Haryana: *A Study of Resources and Services*

Mehar Singh



In this digital age, libraries are really responsible for providing most recent and rapid information to their users to improve the quality of education in the world. And this cannot be done without effective availability and use of ICT-supported resources in the library. The information and communication technology supported resources and services have become backbone for libraries and their users and library professionals to perform various tasks in the technological environment. This paper highlights the availability and use of ICT in the selected engineering college libraries of Sonepat, Haryana.



ICT, College libraries, Library resources & services, Haryana.

1. Introduction

The Information and Communication Technology (ICT) is a term in which the acquisition, storage, processing and retrieval of information through the use of computer based technology. The information and communication technology was first used by Indian Statistical Institute (ISI) Calcutta in 1957. ICT has developed a system to access information on a click of mouse. The development of ICT has made many changes in all spheres of human life and in the field of Library and Information Science. Today, in the ICT environment, the libraries are able to provide information to their users more efficiently and effectively. Due to the development in Science and Technology, there are rapid growths of information in different format. The traditional publishing is shifting towards digital publishing and can be accessed universally. **Kumar and Biradar (2010)** invested in his study the use of ICT-supported resources the college libraries is an important constituent that determines the quality of academic activities going on there. **Ghosh and Ghosh (2009)**[2] In current years libraries in India, particularly IITs, IIMs, IISc and other high-tech institutions have implemented ICT-supported applications.

2. Scope of the study

The study is limited to the selected engineering colleges located in Sonepat, Haryana. These are listed in table as under:

3. Related Literature

A number of related studies have been carried out on various aspects of ICT in libraries in different parts of the world. Only a small number of studies have been reviewed here. **Yadav and Yadav (2012)** reveals that the use of ICT in the engineering college libraries of Uttar Pradesh. The survey told the opinion of users regarding the use of computer as compared to traditional documents. The survey has confirmed that most of the libraries are not providing their services with the application of ICT and most of the users are not trained in handling the ICT related resources. **Patel et. al. (2012)** investigated the use of resources and services based on information and communication technology in the engineering college libraries of Chhattisgarh. The study examined the utilization and the satisfaction level of the user with special reference to ICT. The study was based on a questionnaire survey of the engineering college users. The study also considered further areas including library professional's help in the use of ICT based resources and services. **Kumar (2011)** reveals that the existing situation of ICT in the textile college libraries of Haryana. The study confirms that the textile libraries in Haryana are well strengthen in ICT and are able to meet the requirement faced. The study showed that the trends of libraries have been diversified: these are giving more importance to different aspect of ICT such as internet, e-mail, online database, online Journals etc. **Kumar and Biradar (2010)** explored the use of ICT in college libraries in Karnataka, India. The data gathering tool used included questionnaire, observations and informal interview with selected college librarian. The survey has provided a

useful summary of ICT infrastructure, current status of library automation barriers to implementation and also librarian's attitudes towards the use of ICT. The survey confirmed that the application of ICT in India has not reached a very high level. The lack of budget, lack of manpower, lack of skilled staff and lack of training are the main constrain for not automating library services.

The library professionals have shown a positive attitude towards the use of ICT applications. **Sharma et. al. (2009)** explained that ICT in research libraries of Haryana all the libraries are well strengthen in ICT and are able to meet the requirements faced. NITK library expensed more on various resources rather than NDRI and NBAGR. The study showed that the trends of libraries have been diversified: these are giving more significance to various aspect of ICT such as internet, e-mail, online databases, online Journals, e-books, e-thesis, online FAQ etc. In the ICT race coming time will not give a pause and it is an unavoidable tool in all kind of libraries to survive in the future. **Hyden (2005)** found that the library environment was well-maintained and usable, but still had deficiencies in comfort and infrastructure. **Spacey (2003)** reveals that recent developments affecting the growth of information and communication technology (ICT) in public libraries provide a context against which research into the effects of automation, the introduction of ICT in a variety of library environments and into society generally, are explored.

4. **Design/approach:** Data-gathering tool including questionnaire, observation and informal interview with selected engineering college librarians. The relevant data was collected from BMIET, BPCE, GIET HCE, IITM and SBIT the affiliated institutions and analysed in the tables, figure and using with percentage method.

5. Data Analysis and Interpretation

Table-1

Sr. No.	Name of Engineering Colleges	Abbreviation
1	Bhagwan Mahavir Institute of Engineering and Technology	BMIET
2	Bhagwan Parshuram College of Engineering	BPCE
3	Gateway Institute of Engineering and Technology	GIET
4	Hindu College of Engineering	HCE
5	International Institute of Technology and Management	IITM
6	Shri Balwant Institute of Technology	SBIT

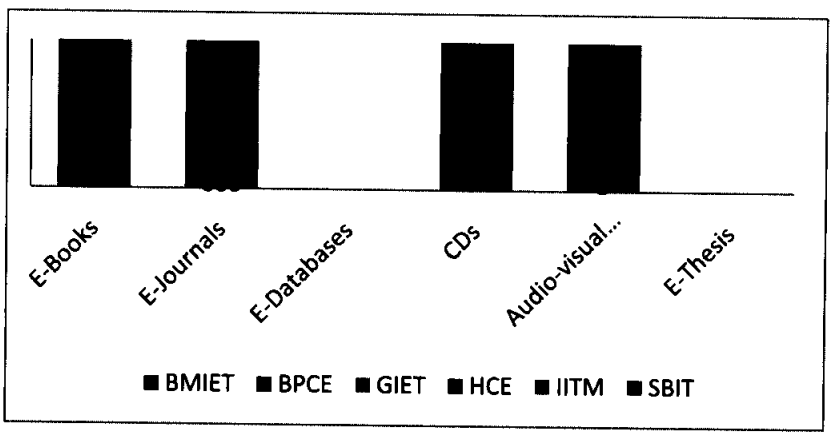


Figure 1- Availability of ICT-supported materials

Figure-1 reveals that the IITM library has the largest collection of ICT based resources i.e. e-Journals 2500, followed by BPCE with 1450 e-Journals, HCE with 1270 e-Journals, SBIT with 1140 e-Journals, GIET and BMIET has the same collection of 600 e-Journals. Maximum CDs are found in SBIT library with 3000 CDs,

followed by BMIET with 2010 CDs, IITM with 1000 CDs, BPCE with 800 CDs, HCE with 300 CDs and GIET has 80 CDs only. The IITM library has 10000 e-books. The SBIT and GIET library has audio-visual facility with 50 and 5 only. The e-databases and e-thesis are not available in all the selected engineering college libraries.

Sharma and Singh (2011) found in his study about availability of non-book materials in college libraries of Karnal that DSCK library has the largest collection of e-books i.e. 80 followed by DAVCK library with 70 e-books, and GNKCK library with 60 e-books, KVA DAV library has 50 e-books. GCK library has the largest audio visual material i.e. 50 followed by GNKCK library 30 and DSCK library 25. There is only 10 number of audio visual material in DAVCK library where as KVA DAV library has no audio visual material. No library provides the facilities of e-Journals.

Table-2 Use of ICT-supported Resources provided by the Library

Resources	Name of Colleges						Total %
	BMIET	BPCE	GIET	HCE	IITM	SBIT	
UPS	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**100%**
Computers	**Y**	**Y**	Y	Y	Y	Y	**100%**
Scanner	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**100%**
Fax	**N**	**N**	**N**	**N**	**N**	**Y**	**16.6%**
Xerox machine	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**100%**
TV	**N**	**N**	**N**	**N**	**N**	**N**	**0%**
LCD Projector	**N**	**N**	**N**	**N**	**N**	**Y**	**16.6%**
CD Server	**N**	**N**	**N**	**N**	**N**	**N**	**0%**
Server	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**100%**
CCTV Cameras	**N**	**Y**	**Y**	**N**	**Y**	**Y**	**66.6%**
Barcode Scanners	**Y**	**N**	**Y**	**Y**	**N**	**Y**	**66.6%**
Printer	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**100%**
Website	**Y**	Y	Y	Y	Y	Y	**100%**

Y=Yes and N=No

The table-2 shows about the use of ICT-supported resources that 16.6% college libraries have the facility of FAX, LCD Projector, 66.6% college libraries have CCTV Cameras and Bar-code scanner facility. All the college libraries have their UPS, Computer, Scanner, Xerox machine, Server, printer and website and none of the college libraries have the facility of ICT resources like TV and CD Server.

Kumar (2012) found in his study regarding ICT based resources and services in engineering college libraries of Haryana that only 13.3% college libraries have the facility of TV, 33.3% libraries have FAX, Xerox and telephone 93.3.% libraries have their e-mail/website and printing facilities and 86.6% have availability of scanner. Out of 15 engineering college libraries none has Slide/LCD Projector facility with it.

Table-3 Use of ICT-supported Services offered by the Libraries

Services	Name of Colleges						Total %
	BMIET	BPCE	GIET	HCE	IITM	SBIT	
OPAC/Web OPAC	**Y**	**N**	**Y**	Y	Y	Y	**83.3%**
Web Browsing/Internet	**N**	Y	Y	Y	Y	Y	**83.3%**
Reservation of Documents	**N**	**N**	N	Y	**N**	Y	**33.3%**
CD-ROM Database Search	**N**	**N**	N	N	N	Y	**16.6%**
Searching Online Journals	Y	Y	Y	Y	Y	Y	**100%**
Searching of e-books	**N**	**N**	N	Y	Y	Y	**50%**
To use e-mail facility	**N**	Y	Y	N	Y	Y	**66.6%**

Y=Yes and N=No

Table-3 indicates how user seeks help from the staff by using the ICT-supported library services. It shows that all the users out of five engineering college libraries seek the help in using the online Journals. More than 83% of the college Librarian respond that users seek help in using OPAC/Web OPAC, web browsing/Internet and 66.6% by using e-mail facility. 50% college Librarians said that users come to them in searching of e-books whereas 33.3% users seek help in using reservation of documents. More than 16% Librarians informed that users seek help by searching of CD-ROM Database.

Table 4 - Factors led to Library Automation

Factors led to library automation	Name of Colleges						Total %
	BMIET	BPCE	GIET	HCE	IITM	SBIT	
Librarian Initiative	√	√	√	√	√	√	**100%**
Heavy work load	**X**	√	√	X	√	X	**50%**
Need to improve the quality of services	√	X	√	√	√	√	**83.3%**
User's pressure	**X**	**X**	X	X	√	√	**33.3%**
To minimize respective task	√	√	√	X	√	X	**66.6%**
Special grant provided	**X**	**X**	X	X	√	√	**33.3%**

√ = Yes and X = No

Table-4 shows that all the librarians have taken initiatives to automate their respective libraries. 50% of the libraries have to adopt automation due to heavy workload. More than 83% of the libraries implemented automation to improve the quality of services. Only 33.3% of the engineering college libraries have to implemented computerisation due to the pressure of their library users and due to special grant provided. 66.6% of the librarians think that automation to minimize the respective task.

Table 5 - Reason for not using the ICT Services

Reason	Name of Colleges						Total %
	BMIET	BPCE	GIET	HCE	IITM	SBIT	
Lack of infrastructure	√	√	√	X	√	√	**83.3%**
Unfriendly view of Library Staff	√	X	√	X	X	X	**33.3%**
Not alert about digital resources	√	√	X	√	√	X	**66.6%**
Slow net connection	X	√	√	√	√	√	**83.3%**
Lack of training	√	√	√	√	√	√	**100%**
Lack of funds	√	√	√	√	X	√	**83.3%**

√ = Yes and X = No

The table-5 shows the reasons of not using ICT based services in view point of librarians. More than 83% librarians agreed that there is a lack of infrastructure; slow network connection and lack of funds are the main reasons in their library behind the non-use of ICT. 33.3% librarians said that unfriendly attitude of library staff is the main reason in their library behind the non-use of ICT. More than 66% librarians told that non awareness about the e- resources is the reason for not using the ICT services in their library. All the engineering college librarians accepted that lack of training is the main reason for not using the ICT based services.

6. Findings

Lack of modern ICT infrastructure all the college libraries has not reached a very high level. None of the engineering college libraries have the facility of e-databases and e-thesis. All the libraries have not e-books excepting IITM library. The e-databases and e-thesis are not available in all the selected engineering college libraries. Lack of skilled manpower, lack of training, lack of funds is the main constraints in their library for using of ICT. Only library professionals have shown a positive attitude towards the use of ICT resources and services. They need appropriate training to make the use of ICT.

7. Suggestions

All the engineering college libraries should be made available the ICT-supported materials to full fill the requirement of the users. All the libraries should apply the ICT in services to expedite the operations. The Wi-Fi facility should also be provided by each college libraries for maximum use of ICT resources and services. The training programme should also arrange by all the engineering college libraries for their users and professionals for optimum use of ICT resources and services. Further, it is recommended that maximum ICT resources and services should be increased by all the engineering college libraries for helping the users in their study and research.

8. Conclusion

The execution of new technology in the libraries mostly depended on the skills of ICT, librarians and library staff attitudes. The availability and use of ICT resources and services in the engineering college libraries needs to be increased. The libraries should make available workshops and seminars for students, faculty members and researchers time to time in using the ICT resources and services.

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Awareness and Use of Internet and Web Resources by the Medical Faculty Members and Students: *A Survey*

Mohd Iqbal Bhat **Mahesh V. Mudhol**

Abstract

Electronic information sources are computer based information sources. There are several forms and types of electronic resources which are available on the Internet, some of the popular ones that are gaining ground are the electronic journals, standards, technical specifications, reports, patents, full text articles, trade reports and hosts of other document sources. This paper presents the findings of a survey about the awareness and use of electronic resources by medical students available in the medical institute libraries. The subjects chosen for this study were faculty members and medical students of SKIMS Soura Srinagar, Jammu and Kashmir, India. For evaluating study questions and data collection, the questionnaire was distributed to a random sample of 300 Faculty members, MD/MS (PG) and MBB final year (U.G.) students. The result of this survey are presented and discussed in this paper.

Medical institute libraries, E-resources, Search engines, OPAC and internet.

1. Introduction

Today, the advent of information technology has resulted in reducing the size of libraries. In fact, these smaller modern libraries are rich potential of information. It has been possible due to the digitization of information. The digital and electronic information is based on digitized data/information, which has gradually replaced paper-based records. As the visual information system in comparison to text based information system is getting more and more popular these days, the traditional libraries are becoming hybrid libraries as they are in the process of doing digitization of their documents and moving towards to become digital libraries. Internet has become an unavoidable requirement for every institution of higher learning. The medical and technical education is important for the development of any country. The medical institutes are very much needed to provide disease free society in the country. Use of the internet is a part of University students 'daily routine, in part because they have grown up with computers. It is integrated into their daily communication habits and has become a technology as ordinary as the telephone or television. Medical College students use the internet nearly as much for social communication as they do for their education. But just as they use the internet to supplement the formal parts of their education, they go online to enhance their social lives. The Internet facility in India has grown tremendously grown over the years. The use of Internet is rapidly increasing owing to its efficiency and capability in providing right information to the right person at the right time. It works around the clock and connects every corner of the world. Internet has become an unavoidable necessasity for every institution of higher learning. The medical institutes are very much needed for the scientific advancement of the country. An attempt has been made to determine the present status and use of electronic resources at Sher-E-Kashmir Institute of Medical Science (SKIMS) Srinagar by faculty members, PG (MD/MS) and UG (MBBS) final year students. For making medical faculty, MD/MS (PG) students and MBBS (UG) students more accomplish and innovative in the work force, information plays vital role, for accessing information and keeping abreast with the new developments, Internet is becoming an essential human need with all its facets.

2. Objectives of the Study

- To assess the contemporary use of electronic information resources.
- To analyze the respondents' extent of access to e-resources.
- To examine the attitude of the faculty members and students towards use of e-resources.
- To find out the main reason(s) behind the usage of electronic resources by them.
- To study the respondents' satisfaction and problems in utilizing the e-resources

3. Literature Review

There are numbers of studies on use of e-resources by students and faculty members. Achonna1 in his research found, use of e-journal resources were low. Lack of skills, inadequate provision of computers and power outrage etc. were the problems faced in use of e-resources. Study concluded the need for the training skills, provision of adequate computers, need to popularize the information technology and its usage and to motivate the students to use e-journal resources. Joteen Singh2 *et al.* executed a study on "Use of Internet Based E-Resources at Manipur University: A Survey" to examine the use of electronic information focusing on the Internet services by post graduate students, research scholars, teachers and non-teaching staff members. Users were using the Internet mainly to download the information from web based resources and web sites. Lack of power supply and the low speed Internet access were general problems faced by users in accessing information from web based resources. Baikady and Mudhol3 explored use of web resources in learning, teaching, clinical practice, and patient care and found that users prefer web-based resources over traditional library and users perceive that web contains exhaustive information and is easy to use. Baskaran4 revealed that maximum use of library is by faculty of science particularly scientific e-journals for repairing seminars, conferences and other assignments. Bashorun5, *et al.* found that the frequency of use of electronic resources by teaching staff was low, as most of the faculty time is spent on teaching. The study also pointed out some of the problems like lack of awareness to users about electronic resources provided by the library, lack of electricity supply to use computer, slow speed of network, and inadequate searching skills. Kumar & Kumar6 found, in his study of medical and management colleges in Bangalore city that the users are well aware of e-resources and prefer to use internet.

4. Methodology

The questionnaire tool was used for collecting the data from the faculty members and students of Shar-E-Kashmir Institute of Medical Science Soura Srinagar (J.&.K). A total number of 300 questionnaires were distributed among the faculty members and students. The investigator could collect questionnaires from only 240 out of 300 medical faculty members and students among whom the questionnaires were distributed. This constitutes 80% (240/300) of the total response. The present study, in its survey of medical professionals about the use of e-resources, has the sample of 300 (120 UG students, 70 PG students and 110 faculty members) respondents, selected from Sher-E-Kashmir Institute of Medical Science (SKIMS) Library Soura, Srinagar.

5. Data Analysis

- **Subject wise Distribution of Respondents:** A study of data in table-1 indicates the subject wise distribution of respondents. It could be noted that out of the total 240 respondents, 20 per cent of them are general medicine and 23.33 per cent of them are gastroenterology. In this study, 29.16 per cent of the respondents are anesthesiology and 15.84 per cent of them are general surgery professionals. It is observed that 11.67 per cent of the respondents are neurology. It is concluded that more anesthesiology medical faculty members and students followed by gastroenterology are the respondents in the study.

Table1- Subject wise Distribution of Respondents

Subject	No. of respondents	Percentage
General medicine	48	20.00
Gastroenterology	56	23.33
Anesthesiology	70	29.16
General surgery	38	15.84
Neurology	28	11.67
Total	240	100.00

- **Age wise Distribution of Respondents:** A study of data in table-2 indicates the age wise distribution of respondents. It could be noted that out of the total 240 respondents, 32.91 per cent of them belong to the age group of below 30 years and 20.00 per cent of them come under the age group of 31-35 years. In this study, 13.33 per cent of the respondents' age is in the range of 36-40 years and 8.33 per cent of them are found in the age group of 41-45 years. It is observed that 11.67 per cent of the respondents belong to the age group 46-50 years and the rest 13.67 per cent of them belong to the age group of above 50 years. It is concluded from the above table that majority of the respondents are found to be with the age group of below 30 years.

Table 2- Age wise Distribution of Respondents

Age group	No. of Respondents	Percentage
Below 30	79	32.91
31-35	48	20.00
36-40	32	13.33
41-45	20	8.33
46-50	28	11.67
Above 50	33	13.76
Total	240	100.00

- **Gender wise Distribution of Respondents:** A study of data in table-3 indicates the gender distribution of respondents. It could be noted that out of the total 240 respondents, majority of the respondents (60.83%) belong to the male group and the rest of them (39.17%) are females. It is concluded that male respondents constitute more in number than female respondents.

Table 3 - Gender wise Distribution of Respondents

Gender	No. of Respondents	Percentage
Male	146	60.83
Female	94	39.17
Total	240	100.00

- **Frequency of Access to Internet:** Data presented in table-4 indicate the subject wise respondents' frequency of access to Internet. It could be noted that majority of the general surgery faculty and student respondents (42.11%) have below 2 hours of access to Internet. Majority of the anesthesiology (40.00 %) have 3-4 hours of access to Internet. Around one third of the gastroenterology faculty and student respondents (28.58%) have above 5 hours of access to Internet. It could be seen clearly from the above discussion that 2-3 hours of access to Internet is quite common among the gastroenterology and general medicine faculties and students.

Table 4 - Frequency of Access to Internet

Subject	Less than 2 hours	2-3 hours	3-4 hours	4- 5 hours	Above 5 hours	Total
General medicine	18	10	6	8	6	48
	(37.50)	(20.84)	(12.50)	(16.66)	(12.50)	
Gastroenterology	10	12	8	10	16	56
	(17.86)	(21.42)	(14.28)	(17.86)	(28.58)	
Anesthesiology	6	8	28	22	6	70
	(8.57)	(11.43)	(40.00)	(31.43)	(8.57)	
General surgery	16	4	8	6	4	38
	(42.11)	(10.53)	(21.05)	(15.78)	(10.53)	
Neurology	7	5	7	5	4	28
	(25.00)	(17.86)	(25.00)	(17.86)	(14.28)	
Total	57	39	57	51	36	240
	(23.75)	(16.25)	(23.75)	(21.25)	(15.00)	

Note: Figures in parentheses denote percentage

- **Frequency of Library Visits:** Data presented in table-5 indicate the subject wise respondents' frequency of library visits. It could be noted that majority of the general surgery and neurology faculty and student respondents make library visit daily. Majority of the general medicine faculty and student respondents (33.34%) make library visit once in a week. One third of anesthesiology faculty and student respondents (31.44%) make library visit once in a fortnight. Around one fourth the gastroenterology faculty and student respondents (28.58%) make library visit as and when required. It could be seen clearly from the above discussion that neurology and general surgery faculty members and students mainly make library visit daily and general medicine faculty and student respondents make high level of library visit at once in a week.

Table 5 - Frequency of Library Visits

Subject	Daily	Thrice a Week	Once in a Week	Once in a Fortnight	As and When Required	Total
Gen. medicine	6	12	16	8	6	48
	(12.50)	(25.00)	(33.34)	(16.66)	(12.50)	
Gastroenterology	10	6	14	10	16	56
	(17.86)	(10.70)	(25.00)	(17.86)	(28.58)	
Anesthesiology	18	18	6	22	6	70
	(25.71)	(25.71)	(8.57)	(31.44)	(8.57)	
General surgery	14	4	10	6	4	38
	(36.85)	(10.53)	(26.31)	(15.78)	(10.53)	
Neurology	10	5	4	5	4	28
	(35.72)	(17.86)	(14.28)	(17.86)	(14.28)	
Total	58	45	50	51	36	240
	(24.16)	(18.75)	(20.83)	(21.26)	(15.00)	

Note: Figures in parentheses denote percentage

- **Mode of Searching Documents in the Library:** Data presented in table-6 indicate the subject wise respondents' mode of searching documents in the library. It could be noted that majority of the general surgery faculty and respondents (42.11%) and also neurology faculty and student respondents (35.72%) search library documents with the help of library catalogue. A considerable number of anesthesiology faculty and student respondents (40.00%) directly search library documents. Around one third of the gastroenterology faculty and student respondents (28.58%) make use of online database to search library documents. It could be seen clearly from the above discussion that anesthesiology faculty and students make use of OPAC to search documents in the library and gastroenterology faculty and students make use of online database to search library mainly.

Table 6 - Mode of Searching Documents in the Library

Subject	Library Catalogue	Library Staff	Directly Search in the Stack	OPAC	Online Database	Total
General medicine	18	10	6	8	6	48
	(37.50)	(20.84)	(12.50)	(16.66)	(12.50)	
Gastroenterology	10	6	14	10	16	56
	(17.86)	(10.70)	(25.00)	(17.86)	(28.58)	
Anesthesiology	6	8	28	22	6	70
	(8.57)	(11.43)	(40.00)	(31.43)	(8.57)	
General surgery	16	4	8	6	4	38
	(42.11)	(10.53)	(21.05)	(15.78)	(10.53)	
Neurology	10	5	4	5	4	28
	(35.72)	(17.86)	(14.28)	(17.86)	(14.28)	
Total	60	33	60	51	36	240
	(25.00)	(13.75)	(25.00)	(21.25)	(15.00)	

Note: Figures in parentheses denote percentage

- **Satisfaction on Search Engines:** A study of data in table-7 indicates the subject wise respondents' satisfaction on search engines. The anesthesiology faculty and student respondents occupy the first position with respect to their overall satisfaction on all search engines as their secured mean score is 3.52 on a 5 point rating scale. The general medicine faculty and student respondents take the second position in their overall satisfaction on all search engines as their secured mean score is 3.38 on a 5 point rating scale. The general surgery faculty members and students rank in the third position in their overall satisfaction on all search engines as their secured mean score is 3.24 on a 5 point rating scale. The neurology faculty and student respondents take the fourth position in their overall satisfaction on all search engines as their secured mean score is 3.22 on a 5 point rating scale. The gastroenterology faculty and student respondents occupy the fifth position in their overall satisfaction on all search engines as their secured mean score is 3.03 on a 5 point rating scale.

It could be seen clearly from the above discussion that anesthesiology faculty and student respondents occupy the first position with respect to their overall satisfaction on all search engines, general medicine the second, general surgery the third, neurology the fourth and gastroenterology faculty and students the last.

Table 7 - Satisfaction on Search Engines

Name of the Search Engines	General medicine	Gastroente-rology	Anesthesio-logy	General surgery	Neurology	Total
Google.com	3.81	2.52	4.11	2.96	3.96	4.01
Yahoo.com	4.11	2.96	4.12	3.14	4.10	3.90
msn.com	3.77	2.26	3.90	2.56	3.76	3.51
sanook.com	2.77	3.11	3.44	3.15	3.52	3.16
hunsa.com	3.52	3.15	2.90	2.85	2.44	2.96
Altavista	2.81	3.52	3.71	3.81	2.52	3.18
Excite	3.85	3.79	2.36	4.11	3.36	3.85
Euroseek	2.36	2.96	3.65	3.36	2.12	2.52
Total	3.38	3.03	3.52	3.24	3.22	3.39

- **Purpose of Using E-resources:** A study of data in table-8 indicates the subject wise respondents' purpose of gathering e-resources. The subject wise analysis examines the following facts. The general medicine faculty and student respondents top the position with respect to their overall purpose of e-resources as their secured mean score is 3.85 on a 5 point rating scale. The gastroenterology faculty and student respondents take the second position in their overall purpose of gathering e-resources as their secured mean score is 3.59 on a 5 point rating scale. The anesthesiology faculty members and student respondents rank in the third position in their overall purpose of gathering e-resources as their secured mean score is 3.16 on a 5 point rating scale. The general surgery faculty and student respondents take the fourth position in their overall purpose of gathering e-resources as their secured mean score is 3.09 on a 5 point rating scale. The neurology faculty and student respondents occupy the fifth position in their overall purpose of gathering e-resources as their secured mean score is 3.00 on a 5 point rating scale.

It could be seen clearly from the above discussion that general medicine faculty and student respondents take the first position with respect to their overall purpose of gathering e-resources, gastroenterology faculty and student respondents the second, anesthesiology the third, general surgery the fourth and neurology faculty and students the last.

Table 8 - Purpose of Using E-resources

Purpose for Using E-resources	Subject					Total
	General medicine	Gastroente-rology	Anesthe-siology	General surgery	Neurology	
For research	3.55	3.14	2.76	3.01	2.96	3.09
For improving area of specialisation	3.48	3.65	2.53	2.42	2.14	3.23
E-books	3.99	3.49	3.72	3.89	3.59	3.80
Career Information	3.36	3.42	2.18	2.26	3.26	2.92
Preparation for class teaching	4.21	3.11	3.85	3.14	2.96	4.02
MEDLINE	4.14	4.21	3.55	3.26	3.12	3.90
E-journals	4.10	4.05	3.62	3.56	3.44	3.85
General Information	3.52	3.10	2.36	2.49	2.16	2.78
Sending and receiving e-mail	4.21	4.21	3.81	3.78	3.57	4.00
Entertainment	3.33	2.42	2.21	2.56	2.89	2.65
Total	3.85	3.59	3.16	3.09	3.00	3.49

- **Barriers in Accessing E-Resources:** A study of data in table-9 indicates the subject wise respondents' barriers in accessing e-resources. The subject wise analysis examines the following facts. The neurology respondents top the position with respect to their overall barriers in accessing e-resources as their secured mean score is 3.94 on a 5 point rating scale. The general surgery respondents take the second position in their overall barriers in accessing e-resources as their secured mean score is 3.85 on a 5 point rating scale. The anesthesiology respondents rank in the third position in their overall barriers in accessing e-resources as their secured mean score is 3.44 on a 5 point rating scale. The gastroenterology respondents take the fourth position in their overall barriers in accessing e-resources as their secured mean score is 3.11 on a 5 point rating scale. The general medicine respondents occupy the fifth position in their overall barriers in accessing e-resources as their secured mean score is 3.02 on a 5 point rating scale. It could be seen clearly from the above discussion that the neurology respondents take the first position with respect to their overall barriers in accessing e-resources, general surgery respondents the second, anesthesiology the third, gastroenterology the fourth and general medicine faculty and students the last.

Table 9 - Barriers in Accessing E-Resources

Barriers						Total
	General medicine	Gastroente-rology	Anesthe-siology	General surgery	Neurology	
Difficulty in finding relevant information	3.55	2.98	3.44	4.02	3.98	3.55
Virus	4.05	3.66	3.69	4.11	4.16	4.00
Limited access to computers	3.34	3.52	3.96	4.10	4.05	3.65
Lack of Time	2.26	2.79	3.10	3.50	3.62	2.80
Too much information retrieved	2.65	3.16	3.10	3.41	3.52	2.75
Longtime to view	2.42	2.79	3.21	4.01	4.11	3.20
Slow accessibility	2.49	2.39	2.99	3.65	3.96	2.90
Total	3.02	3.11	3.44	3.85	3.94	3.33

- **Views on Library Services:** Table-10 presents data on the subject wise respondents' views on library services. It could be noted that more than one third of the general surgery respondents (42.11%) and general medicine respondents (37.50%) observe that library services are excellent. Around one fourth of the general medicine and anesthesiology respondents view mainly that they have no opinion about library services. A considerable number of anesthesiology respondents

(31.44%) perceive about the poor performance of library service. Around one third of the gastroenterology faculty members and students have very poor opinion about library services. It is concluded that general surgery and general medicine view mainly about the excellent performance of library services in Shar-e-Kashmir Institute of Medical Science (SKIMS) Soura Srinagar.

Table 10 - Views on Library Services

Subject	Excellent	Good	No Opinion	Poor	Very Poor	Total
General medicine	18	10	6	8	6	48
	(37.50)	(20.84)	(12.50)	(16.66)	(12.50)	
Gastroenterology	10	6	14	10	16	56
	(17.86)	(10.70)	(25.00)	(17.86)	(28.58)	
Anesthesiology	18	18	6	22	6	70
	(25.71)	(25.71)	(8.57)	(31.44)	(8.57)	
General surgery	16	4	8	6	4	38
	(42.11)	(10.53)	(21.05)	(15.78)	(10.53)	
Neurology	7	5	7	5	4	28
	(25.00)	(17.86)	(25.00)	(17.86)	(14.28)	
Total	69	43	41	51	36	240
	(28.75)	(17.92)	(17.08)	(21.25)	(15.00)	

Note: Figures in parentheses denote percentage

5. Results and Discussion

The survey launched in April 2012 at the SKIMS central Library revealed that 2-3 hours of access to Internet is quite common among the gastroenterology and general medicine faculties and students. Neurology and general surgery faculty members and students mainly make library visit daily and general medicine faculty and student respondents make high level of library visit at once in a week. Majority of the general surgery faculty and student respondents (42.11%) and neurology faculty and student respondents (35.72%) search library documents with the help of library catalogue. Anesthesiology faculty and student respondents occupy the first position with respect to their overall satisfaction on all search engines, the general medicine faculty and student respondents top the position with respect to their overall purpose of using e-resources as their secured mean score is 3.85 on a 5 point rating scale. Neurology respondents take the first position with respect to their overall barriers in accessing e-resources, more than one third of the general surgery respondents (42.11%) and general medicine respondents (37.50%) observe that library services are excellent. The advantages of e-resources have drawn attention of the library users to a great extent. Accordingly, these resources have occupied a significant place in the collection and budget of almost all libraries. Medical Faculty members and students' attitudes seem to be very positive towards e-resources for their study and research and the role of libraries as gateway to provide assistance in accessing these resources. Faculty members and students are heavily dependent on e-resources for their required information and to keep themselves up-to-date in their subject area. Though some expects that the role of libraries as a gateway to the e-resources will have less importance in future as faculty members and medical students access more and more e-resources in their respective departments or personal desktop/laptops, it seems to be more hypothetical. Rather the role of libraries in the age of e-resources will increase tremendously, particularly in providing training and guidance to use authentic and relevant information. The libraries should develop necessary tools to provide such services to their users satisfactorily. The speed of Internet needs to be increased for quick access to the available e-resources. The SKIMS Central Library needs to arrange various orientation and training programmes for faculty members and students for the optimum use of available e-resources. In this context, the SKIMS Library may arrange orientation programmes and subscribe more databases for its users.

6. Suggestions

Based on the various observations of the study the following suggestions are made:

- More computer terminals should be installed in the library for easy access to faculty members and students.
- The problems of slow access speed can be overcome by increasing the bandwidth.
- Increasing resources should be allocated for enriching digital resources for the benefit of users.
- Awareness should be generated on the e-resources to obtain current information.
- The qualified medical staff should be appointed to provide the expert guidance to users about e-resources.

Some orientation training programmes should be organised by the SKIMS central library at regular intervals so that the maximum users can improve their excellence or proficiency in the use of computers and e-resources.

7. Conclusion

The development of medical e-resources grossly depends on the application of ICT technologies. Librarians have a better role to play in the process. They have to coordinate the efforts of all sections of medical or health system. Librarians are better professionals to coordinate different sections of the communication system, as they are familiar with the information work as information workers. For this, the governments and the management of the concerned medical institutions should support and encourage the libraries and librarians by framing necessary policies, developing standards and procedures and encouraging specialization, with an emphasis on E-resource organization and control, so that the medical librarians will be enabled to render more productive and efficient services. The library environment has currently undergone drastic change in terms of collections and services. The proliferation of e-resources has had a significant impact on the way the academic community uses, stores and preserves information. Technology is in a position now to offer great potential for teaching and learning medicine. The challenge is to combine the expertise of technologists with the expertise of medical educators, clinicians and basic scientists in efforts to design and develop innovative approaches towards medical education that utilize IT to its full potential for maximum educational value.

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Collection Development Process in Engineering College Libraries: *Advice from the Trenches*

Syeda Majeed Muneer



The article is to provide guidelines for the collection of materials by the Engineering College Libraries. This document is intended to give information about scope of the collection and to provide criteria and priorities for the selection and de-selection of materials in the collection.



Information resources, Electronic Formats, New Technology, Collection Materials

1. Introduction

The Scientific and sustainable development of society, the constructive application of Engineering knowledge from time to time is necessary. Therefore, the importance of engineering education society is realized. This kind of knowledge and education is imparted in higher learning and professional institutions particularly in engineering colleges. To meet the requirement of materialistic development of the society, the engineering education in India has developed and it is recognized globally. The development of engineering education in India is quite laudable and the trained engineering graduates are capable enough to meet the challenges at global level. The beginning of engineering education in India can be traced back to the establishment of Thomas College of civil engineering at Roorkee in 1847.

Many committees are being appointed by government of India for development of engineering education. The UR Rao committee (2002) stressed upon the qualitative engineering education, there shall be a greater role of libraries attached to engineering colleges. While the teacher initiates the students in the new vistas of knowledge, the library provides further knowledge to shape the personality of students further. So the library has to acquire the available knowledge in different forms and it should be made available to users.

2. Collection Development

One of the most important tasks undertaken in any library-physically or digital is collection development, for without a collection there is no library. According to Mc Colvin (1925), "book selection is the first task of librarianship... the ultimate value of a library depends upon the way in which the stock has been selected."Of course, collection development in a digital library is not primarily concerned with book selection, but rather with the selection of both physical items to digitize and "born-digital" materials in any number of electronic formats. The point remains valid, however, that the value of a library is the value of the materials in its collection is the sum total of that library's book holdings, a more modern definition, however, is that a library's collection is the sum total library's holdings of materials in any media format.

The value of a library-physical or digital –may take any or all several forms, economic, moral, philosophical, etc. Additionally, this value may be different for different patron communities and purposes that the library serves. Collection development policies are as important to digital libraries as they are to physical libraries. A good digital collection is created according to an explicit collection development policy that has been agreed upon and document before digitization-that is, through the creation of electronic versions of physical materials. A more inclusive definition of a digital libraries, however, there is a correspondingly greater concern with the needs of the library's user community. As a digital library matures, it "seems to rediscover users. As the integration of new technologies begins to transform the library and the possibilities for constructing innovative networked services libraries see a pressing need to engage users and to reassess their interests and needs" Indeed, a Digital library is in many ways like an academic or a special library, in that its primary Patron community is fairly well defined.

3. The Special Collection

In a physical library, the reference department usually has its own special collections a subset of the collection in the whole library. Reference collections generally consist of two parts : the entire reference collection and the ready reference collection – a subset of entire reference collection , consisting of those information resources most frequently used at the reference desk. Though digital libraries are getting much attraction from the librarian's world yet there are varicose issues related to collection development and management in a digital environment. The electronics offer ease of use, wider access, rapid updating, cost saving over local maintenance and storage, but the librarians are finding it difficult to define issues related policy of collection development and archiving of electronic resources. The electronic resources require continuing management to a far greater degree than print resources do. The following issues are the most important:

- Budget.
- Quality of the product
- Technological obsolesce
- Access (licensing)
- Copyright
- Human resources
- Data migration
- Ownership
- Archiving of e-resources

- **Budget:** The library director is responsible for allocating an acquisitions budget in such a way as to fulfill the above mentioned collection development goals. Priority for purchase of material reflects such factors as the curriculum, number of students and faculty , available circulation statistics, and requests. The rate of publishing and average cost of materials is also considered. The budget allocation is reviewed annually. The library director reserves the right to reallocate funds as necessary based on technological changes, curriculum changes, and institutional changes.

- **Selections/Purchase Methods:** Materials will be purchased first from book jobbers, serials subscription agents, and if necessary, directly from the publisher/producer. The faculty librarians may suggest various methods of acquisition; including approval plans, licensing agreements, and standing orders, which the director must approve. Classic and heavily used items will be purchased in hardcopy; others will be purchased in paperback when available. Multiple copies for highly requested items will be purchased as needed.

- **Gifts:** The library accepts gifts and donations, preferable when no restrictions are attached for integrations into the collections. In the most cases, the director of the library reserves the right to accept or reject gifts as deemed appropriate by the general guidelines for selection as outlined above. The library reserves the right to dispose of unwanted materials as seems fit. all gifts and donations will be acknowledged and the donor will be asked to sign a deed of gift from, which will include a statement on these policies and procedures. The library is not responsible for appraisals of gift materials. Items in poor physical condition, especially those containing active mold and mildew will not be considered for acquisition.

- **Resource Sharing:** Attempts will be made to share resources through reciprocity agreements with local libraries, document delivery, and inter library loan where possible, to provide materials not suitable for permanent collection.

- **General Guidelines For De-Selection:** The staff of the library reserves the right to remove materials from the collection when they no longer support for curriculum or contain out dated material faculty

and administrators maybe consulted. Damage materials are evaluated for conversation, and maybe discarded and /or replaced.

4. Collection Development Goal

The goal of collection development is to make as much information as possible available to the college community, student, faculty, administration and staff. These information resources will consist of an on-sight core collection of important and useful words of literature and scholarships. Supplemental to this will be access to other collections and the basis by inter library loans and document delivery of appropriate items not owned by Carthage. We do not subscribe to the view that ownership is the only (or even primary) indication of the quality of a collection or of information service. In other words, bigger is not necessarily better. Rather, our goal is to achieve a balance between ownership of and access to information, with user convenience and budgetary limitations firmly in view. All types of recorded information, including print and non-print material in all formats, maybe acquired or made accessible. An important consideration will be whether access can be made available to users in the library, classrooms, faculty, staff offices, residence hall rooms, and from home and or other off- campus locations. When appropriate, computer access over the campus wide network maybe favored over traditional print resources. Access to and ownership of information will be consistent with our goal of creating an "electronic teaching library" or "virtual library" for the Carthage community and a "gateway" to information sources around the world.

- **General Criteria for Selections:** Additions to the library collection will be selected on the basis of:
  - Support for curricular needs.
  - Appropriateness for undergraduate use.
  - Master's programs that the College supports.
  - Strength of present holdings on a topic.
  - Faculty review and recommendation.
  - Demand and potential use.
  - Reviews and critiques appearing in standard selection sources.
  - Program requirements.
  - Budgetary resources.

The library does not allocate specific amounts of its material budget to academic departments. Though some equity among programs is sought, consideration is given to the reality that the cost of materials is not the same for all disciplines. This allows the library flexibility to meet needs as well as unanticipated changes in curricula and in patron demand, ultimately providing better service in all areas. However, department heads and program directors should encourage and coordinate selection activities of their faculty and staff members.

A major source of reviews of materials suitable for college libraries is the periodical Choice. Additional recommendations should be based upon current scholarly reviews as well as personal/professional judgment. The library attempts to have a carefully selected collection that meets the needs of all departments, thus indiscriminate choices from publisher's catalogs and blurbs should be avoided. In cases where an individual or department makes numerous requests. The requester(s) should be prepared to rank in importance or set priorities on the items desired.

5. Weeding and Discarding of Library Materials

Weeding is the process of discarding materials that are no longer desired or transferring them to another part of the collection (for example, from the reference collection to circulating stacks). Regular weeding helps maintain a useful, current, and authoritative collection that supports the Carthage community.

When a new edition (of reference materials , for example) is received, the old edition is evaluated and in some cases withdrawn. As materials are sent to Technical Services for repair, they are evaluated for retention on replacement. In consultation with academic departments, the thorough weeding of a specific Library of Congress classification section of the collection is periodically undertaken. Using established criteria and standard bibliographies, such as Books for College Libraries, items are earmarked for weeding. Lists containing those titles recommended by the library staff for withdrawal are sent to the relevant department for faculty recommendations. Faculties are urged to recommend for withdrawal those items they believe no longer serve the curriculum. The VP for Academic Information Services or hi/her designee shall be the sole judge of the final disposition of discarded materials.

Materials will be removed from the collection when those items no longer seem useful because of the following:

- Inaccurate information
- Outdated information
- Lack of demand for material
- Physical condition
- Duplication of seldom used materials
- Superseded editions
- Newer material on subject
- Obsolescence of formats
- In compatibility of format to equipment available
- Level of treatment
- Lack of space
- Other materials fulfill the same need better
- Language in which material is written
- Cost of continuing subscription or standing order
- Availability of indexes.

6. Lost Materials

Search for missing items will be conducted for up a year before being declared lost. If not found, criteria for replacement will be similar to that applied for first-time purchases and will be done on a title-by-title basis. High demand items may be replaced sooner, while the search for the missing items continues.

7. Formats

The library will acquire materials in various formats, and priority will be given to current material, although out-of-print materials will be collected as requested, needed, and/or available. Print materials may include monographs and such reference materials as dictionaries, encyclopedias, handbooks, directories, indexes, and abstracts. Only classics and lasting contemporary fiction that may support the curriculum will be collected.

Textbooks are acquired on a limited basis. Factors considered include number of sections, number of requests, faculty request, and required texts for core courses. Textbooks currently required for courses do not circulate.

Criteria for selection of current Text books (in no particular order)

- Required text for core courses.
- There are multiple sections of the course.

- Requested by faculty.
- Requested by students directly or through library staff.

8. Conclusions

Collection Development is a challenging arena for new graduates not yet well versed with practical knowledge and, by definition, experience. In addition, the field of Collection development is changing at e rapid pace and keeping up with these changes requires the use and awareness of many new and evolving types of resources.

Continuing enhancement of the skills required identifying, evaluating, and select new materials in a wide variety of formats is a primary element for the advancement of both career and collection. Only with practice and research can one hope to make the best decisions for a library and its users.

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Consortia of Library Networks: *Present Indian Scenario*

Bidyut K. Mal **Jyoti Kumar Singh**



Joining a consortia, integrating intellectual access, providing for both physical and electronic development process are all the distinct steps moving towards 21st century libraries. Developments in modern resource sharing whether they be document delivery services or computing services do not alter the ethics of librarianship. Keeping in view the old traditions and applying them the new environment will make institutions grow and provide useful service for the betterment of resource through consortia. This paper discussed about the present situation of networks in India. This paper also discussed about some major library consortia initiative in India and discussed elaborately about UGC-Infonet Digital Library Consortia DELNET Consortia and HELINET Consortia.



Resource sharing, Networks of India, Consortia, UGC-Infonet DELNET Consortia, HELINET Consortia.

1. Introduction

Access to information holds the key to development. Libraries which are store houses of knowledge and information, and information centers, disseminate knowledge and information, form two important components of present day society. Resource sharing and cooperative functioning through networking have become inescapable for libraries and information centres worldwide.[1] For libraries to use their resources more efficiently and effectively for the users is a great task. This task can be solved to a great extent by resource sharing and cooperative functioning among libraries. And for this, networking of libraries, applying latest modern techniques is a must. Resource Sharing and Networks, these two terms are interrelated one upon another in the area of Library & Information Centre to access the recourses at maximum level of utilization for the widely existing each and every users.[2] Increase of the literature in all subjects and shrinking of library budget made the libraries depend upon each other. This leads to library cooperation, resource sharing, and networking and further establishing library consortia.

2. Networks

A library network is broadly describe as a group of libraries coming together with some agreement of understanding to help each other with a view to satisfying the information needs of their users. Library Network is basically a formal agreement between two or more different types of libraries who share their resources, information & services without any geographical restrictions. The main aim of Network is easy and the quick communication of information and the first and foremost advantage of library Networking is Resource Sharing.[2] The purpose of the library network is to provide network based services to Users, document Delivery Services, bibliographic Information Services, and human Resource Development.

3. Library and Information Networks in India

Some of the important and significant networks that exist in India are given below:

- **General Networks:** NICNET (1977), INDONET (1986), I-NET (formerly VIKRAM) (1991), RABMN (1991).
- **Library Networks (Metropolitan):** CALIBNET (1986), DELNET (1988), PUNET (1992), ADINET (1993), MALIBNET (1993), BONET (1994), MYLIBNET (1995), BALNET (1997).
- **Library Networks (Wide Area):** INFLIBNET (1991).

- **Information Networks (Sectoral):** ERNET (1986),VIDYANET, OPNET, SIRNET, BTISNET, DESINET (1986).

Some of the library network initiatives discussing briefly mentioned in Table-1.

Table-1: Networks of India

Name, Place, Website	Starting Year	Promoting Agency	Member	Activities
ADINET Ahmedabad Library Network (Ahmedabad) http://www.alibnet. org/	1994	INFLIBNET & NISSAT	2077	Current trends in library, Lectures, Seminars, Publications, Library automation in progress, Training programme, Outsourcing work, CIP in Data
BALINET Bangalore Library Network (Bangalore)	1995	NISSAT	100	Activity will start after getting financial support from NISSAT
CALIBNET Calcutta Library Network (Kolkata) www.calibnet.in	1992	NISSAT		Access to Internet and Dialog,CD-ROM database searching, Networking, Implementation of a series of Databases,Bibliographic,Factual. and Intellectual Assets of West Bengal
DELNET Developing Library Networking (Delhi) http://www.delnet. nic.in/	1988	NIC & NISSAT	4683	Access to union catalogue and databases, Inter library loan, Retro conversion, Reference service, Professional Training, Technical Support, Library software. DELNET arranges Tutorials, Workshops, Lectures, Annual National Convention from time to time
HELINET Health Science Library and Information Network (Bangalore) http://www.rguhs.ac.in/digitallibrary/Helinet%20about%20us.html	2002	RGHUS	600	To network all the health sc. Libraries for minimizing the cost of acquisition and maintain of learning resources and maximizing their utilization among the faculty, students and researchers in the health sc. colleges and institutions.
INFLIBNET Information and Library Network (Gandhinagar) http://www.inflibnet.ac.in/	1991	UGC		Document delivery, Union catalogue, Database of periodicals, Training programme, Library software, Print archives.

MALIBNET Madras Library Networking (Chennai) http://www.malibnetonline.com/	1993	Society & INSDOC	37	Current serials database Journal contents database (1,00,000) records All INSDOC databases on MALIBNET Automotive engineering database (4,500 records) Access to Internet and Knight Ridder (Dialog) database CD-ROM database searching
MYLIBNET Mysore Library Network (Mysore)	1994	Society, Mysore Library Consortium & NISSAT		Library automation in progress
NICNET (New Delhi) www.nic.ac.in	1987	Planning Commissio n, Govt. Of India		Value added e- mail, broadcasting and bulletin service, bulk file transfer, teleconferencing, full text and bibliographic retrieval services
INDONET (Hyderabad) www.indonetglobal.com		CMC Ltd., Hyderabad		Database services like DIALOG, COMPUSERVE, and IP, SHARP
NKN National Knowledge Network (New Delhi) http://www.nkn.in/		Knowledge Commissio n, Govt. of India	824	Internet, Intranet, Network Management Views, e-Mail, Messaging Gateways, Caching Gateways, Domain Name System, Web Hosting, Voice over IP, Multipoint Control Unit (MCU) Services, Video Portals, SMS Gateway, Co-Location Services, Video Streaming etc.

4. Consortia

A consortium is an association of two or more individuals, companies, organizations or governments (or any combination of these entities) with the objective of participating in a common activity or pooling their resources for achieving a common goal. Library consortia means to co-operation, co-ordination and collaboration between, and among, libraries for the purpose of sharing information resources.[5]A library consortia can be considered as a formal association of libraries, not under the same institutional control, but usually restricted to a geographical area, number of libraries, types of materials, or subject interests, which is established to develop and implement resource sharing among members.

The objectives of library consortia are

- To control and reduce information costs,
- To improve resource sharing, to develop a network information environment,
- To share licensing issues with each other.

5. From Networks to Library consortiums

The demands for new information and sources are unending because the changes are happening thick and fast. No one library or more can ever think of becoming on their own sufficient. Hence it is necessary to enter into a collaborative arrangement whereby while effecting savings, the resource base expands. The savings could be used for adding new resources. As a step towards it they have formed a consortium.

6. Resource sharing through consortia

Consortia can take up following activities for promoting information resource sharing:

- Cooperative collection development among member libraries
- Cooperative processing of information resources acquired through consortium
- Creation of virtual library covering all the e-resources available in member libraries
- Compilation of bibliographical and /or full-text databases of the holdings of the member libraries, both print and non-print
- Sharing of information resources, both traditional and digital, of member libraries through network or document delivery service
- Allowing reciprocal borrowing by the members of all libraries of the consortium
- Supporting member libraries for setting institutional repositories, e-print archives, electronic theses collection, etc.

- **Library Consortia in India**

The International Coalition of Library Consortia (ICOLC: http://www.icolc.net) is an informal group, at present lists approximately 200 library consortia from around the world. It supports participating consortia by facilitating discussion on issues of common interest. After China, India is the second largest subscriber of consortia based library subscription of e-resources. Some major Indian library consortia are:

- INDEST -AICTE Consortium
- UGC-Infonet Digital Library Consortium
- National Knowledge Resource Consortium
- IIMs' Consortium
- FORSA Consortium
- HELINET Consortium
- ISRO Library Consortia
- TIFR Libraries Consortium
- DELNET Consortia

The details of some major Indian library consortia are given in Table-2.

Table-2: Indian library consortia

Nam Place Website	Estb. Year	Subject/ Coverage	No. of Journals/ Publishers	No. of Members	Services
INDEST-AICTE Consortium (New Delhi) http://paniit.iitd.ac.in/indest/	2003	Sc.& Tech and Mgmt	1200+ e-journals from 25 publishers; 6 bib and citation databases	1363	e-Content licensing, inter lib loan, training, cat services
UGC – Infonet Digital Library Consortium (Gandhinagar) http://www.inflibnet.ac.in/	2003	All subjects areas	7000+ e-journals from 26 publishers and aggregators; 10 bib and citation databases	321 univ and colleges	e-Journal licensing, inter lib loan, training, cat services
NKRC CSIR e-Journal Consortium (New Delhi) http://nkrc.niscair.res.in	2001	Sc.& Tech	4500 e-journals from 28 publishers	39 CSIR and 24 DST inst.	e-Journal licensing
DeLCON DBT e-Library Consortium (Gurgaon) http://delcon.gov.in/	2009	Lifesciences	926 e-journals and SCOPUS Database	34 inst. And BIRAC	e-Jour licensing
RGUHS-HELINET Consortium (Bangalore) http://www.rguhs.ac.in/digitallibrary/Helinet%20about%20us.html	2003	Medical and Health Sc.	600+ e-journals 2000 e-Books 1500 videos from 24 publishers	270 med. colleges	e-Journal licensing
CeRA (New Delhi) www.cera.jccc.in.	2007	Agriculture Sc.	2000+ e-journals from 8 publishers	126 inst.	e-Journal licensing, inter lib loan, training, cat services
DELNET Consortium (New Delhi) www.delnet.ac.in		Mgmt., Pharmacy, Engg, Tech, Medical Sc.	16269 e-Journals		e-Journal licensing, inter lib loan, training, cat services
FORSA Consortium (Bangalore) http://dhruva1.ncra.tifr.res.in/library/forsaweb/index.htm	2004	Astronomy and Astro-physics		12	Collection sharing, Training and Electronic content licensing

Among the above all only UGC-Infonet Digital Library Consortia, DELNET Consortia and HELINET consortia are belong to library network these are discussing below:

- **UGC- Infonet digital library consortia:** The UGC-Infonet Digital Library Consortium was formally launched in December, 2003. The Consortium proved to be a recipe to university libraries which have been discontinuing subscription of scholarly journals because of "Serials Crisis". The Consortium provides current as well as archival access to more than 7500+ core and peer-reviewed journals and 10 bibliographic databases from 26 publishers and aggregators in different disciplines. The programme has been implemented in phased manner. In the first phase

that began in 2004, access to e-resources was provided to 50 universities who had Internet connectivity under the UGC-Infonet Connectivity programme of the UGC. In the second phase, 50 more universities were added to the programme in the year 2005. So far 209 Universities including 14 National Law schools and central universities that come under the purview of UGC, have been provided differential access to subscribed e-resources. These e-resources covers almost all subject disciplines including arts, humanities, social sciences, physical sciences, chemical Sciences, life sciences, computer sciences, mathematics and statistics, etc. The programme is wholly funded by the UGC and executed by the INFLIBNET (Information and Library Network) Centre, Gndhinagar.

- **DELNET Consortia:** DELNET was started at the India International Centre Library in January 1988 and was registered as a society in 1992. It was initially supported by the National Information System for Science and Technology (NISSAT), Department of Scientific and Industrial Reseach, Government of India. It was subsequently supported by the National Informatics Centre, Department of Information Technology, Ministry of Communications and Information Technology, Government of India and the Ministry of Culture, Government of India.

  DELNET has been established with the prime objective of promoting resource sharing among the libraries through the development of a network of libraries. It aims to collect, store, and disseminate information besides offering computerised services to users, to coordinate efforts for suitable collection development and also to reduce unnecessary duplication wherever possible. DELNET Consortia developed to provide e-journal licencing on management, pharmacy, engineering, science & technology and medical science.

- **HELINET Consortia:** The Digital Library has designed, developed and evolved the state-of-the-art HELINET Consortium of scholarly international e-journals, e-books and databases to meet the needs of academic and research community of health science disciplines in the state of Karnataka through Rajiv Gandhi University of Health Sciences.

  HELINET Consortium is first of its kind in the country when it was started in the field of health sciences information network in the year 2002. About 600+ core international e-journals, 2000+ e-books, 1500+ videos and databases are being subscribed/ procured and provided to students and faculties and research scholars pursuing their studies in various faculties of health sciences of all the respective affiliated colleges under RGUHS.

  This is commendable growth in the utilization and progress in the e-awareness developed towards enrichment of scientific knowledge by the digital library and information centre of RGUHS. The HELINET Consortium has set a role model for adoption, implementation and extensive use by the larger medical community in the country as a National Focal Point.

7. Conclusion

Library consortia are created to help libraries obtain better prices by buying joint access for a greater number of users, expanding access to print and electronic collections and developing new services to meet their user's needs. Libraries can acquire more resources by paying less if they are members of consortia. In India, so many library networks are functioning some of them are doing very well job but resource sharing through consortia is an important work among all works this present electronic environment and any library network can do this job very easily. So all library networks must concentrate to develop consortia for resource sharing which may be change the present Indian scenario.

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CONSPECTUS: *A Tool for Library Collection Assessment and Development*

Singh, D K



The effects of rising costs for information continue to influence the ability to acquire the necessary materials for the students and faculty in academic libraries, and for the clientele of other libraries. Librarians have moved away from a time when the library collection was regarded simply as "an orderly assemblage of books and journals". Then, as teaching and learning have adopted newer methodologies, made possible by new technologies, the collection is now considered as "a systematically established aggregate of multi-media intended to convey information and knowledge". One can research quality of collection by several methods simultaneously. Each library should choose and start with any of them in order to reach their aim. The best way is to combine all methods of collection development. It will be possible to use Conspectus method when standards are developed, because measuring of collection percentage proportion standards are required. In this paper concepts, purpose of conspectus and how conspectus is beneficial for librarian in collection development and assessment are described.



Collection Management, Collection Development Tool, Conspectus

1. Introduction

Library collections are established for the purpose of inquiry, education, research, and recreation. Libraries' main motivation is to select, maintain and provide access to relevant information sources; they are built to meet the needs of their patrons. Collection management provides practical, research-based information about sharing, administering and building, preserving, assessing and organizing library collections. Due to technological developments, the management and development of these collections are in a constant state of evolution. Collection assessment is a way of keeping collection management in proper, functioning order. Conspectus methodology, originated in the 1970s by the Research Library Group (RLG) and then nationalized by the Association of Research Libraries (ARL) in 1983, is one such management tool used in libraries all over the world.

Librarians now better understand the need to retain important, essential information and material for their patron base. Collection-management has replaced collection-building and Conspectus, although criticized at times for being pricey, time-consuming and (of late) obsolete, can be a great tool for mapping the strengths and weaknesses, the expertise and genuine wisdom of individual institutions and tailoring collections through compatibility. Conspectors should gather what they know and reasonably estimate what they do not know in order to enhance their collections.

Mega trends within the new IT era have shifted our focus from 'just in case' to 'just in time' and reduced the emphasis away from 'collection building' to 'access'. We have become an information society, working in a network environment with multiple options that are high tech/high touch and driven by self help. Dare I suggest it, but the spirit of cooperation seems to have been overtaken by a free for all in the fight for resources and the allocation of funds. The common good is being pushed aside by the 'what's in it for me' mentality in the fight for survival.

2. Concepts of Conspectus

Webster's Third International Dictionary of the English Language (1967) defines Conspectus as: "a survey (as of a comprehensive subject) usually in brief compass or rapid topical summary and often providing an overall view or perspective."

Conspectus is an instrument for libraries to describe their existing collection strengths and current collecting intensities by assigning a set of simple alpha-numeric codes, within the basic framework of the Library of Congress subject classification.

Harrods Librarians Glossary defines: Conspectus is a system which enables information about the collections of libraries and their collection development practices to be recorded in a relatively standardised way and which allows some detailed comparisons to be made between the collections of libraries involved. The term is used to refer both to the methodology involved in describing collections and to the database of standard collection descriptions that results.

For the purposes of analysing subject collections, the Guide for Written Collection Policy Statements (American Library Association, 1989) strongly recommends that the Conspectus approach be used by libraries of all sizes. The Guide defines the Conspectus as "an overview or summary of collection strengths and collecting intensities, arranged by subject, classification scheme, or a combination of either, and containing standardised codes for collection or collecting levels and for languages of materials collected. Such a Conspectus is a synopsis of a library collection or of a consortium's or of a network's coordinated collection overview or policy." For each subject category, existing collection strength; CCI: current collecting intensity (or acquisition intensity); DCI: desired collecting intensity (or collecting goal), are described using codes to indicate collection intensity levels. Notes are used to describe special features of the collection, e.g. chronological and geographical parameters, any subject emphasis unique to the institution, and inclusion/exclusion boundaries.

Conspectus was created in 1979 to support the efforts of the United States Research Libraries Group (RLG) to cooperate and share resources among its members. Some 100 US libraries including members of the Association of Research Libraries as well as RLG have now completed Conspectus statements for at least part of their collections, and responsibility for building collections in some 550 subject areas has been shared out. Analysis is based on a library classification scheme, and strengths and collecting intentions are assessed against a set of more-or-less universally agreed categories ranging from 0 (out of scope -the library docs not collect in this area) to 5 (comprehensive -the library attempts to collect exhaustively) in table 1. RLG collection level codes are used by collection managers to indicate their subjective assessment of the following:

- How a collection has been created in the past (Existing Collection Strengths, ECS)
- The current focus within the collection (Current Collection Intensity, CCI)
- How they intend to approach the collection in the future (Desired Collection Intensity, DCI).

Table 1

Level 0 Out of Scope
The library does not collect in this area.
Level 1 Minimal
A collection for which few selections are made beyond introductory/ very basic material.
Level 1a Minimal with Uneven Coverage
Few selections are made and there is uneven representation of a subject.
Level 1b Minimal with Even Coverage
Few selections are made, but key authors, some core works, or a spectrum of views is represented.
Level 2 Basic Information
A collection of up-to-date materials which serves to introduce and define a subject and to indicate the varieties of information available elsewhere. It may include dictionaries, encyclopedias, access to appropriate bibliographic databases, standard and significant works, handbooks manuals, films, sound recording and a few popular or major serials. A basic information collection can support general enquiries in school and some undergraduate instruction, and information at a popular level, but is not sufficiently intensive to support advanced undergraduate courses.

Level 2a Basic Information: Introductory

The emphasis at this level is on providing resources that introduce and define a subject. A collection at this level include basic reference sources and explanatory works, such as text books historical descriptions of the subject's development, general works devoted to major topics and figures in the field, and selective major periodicals. This level is sufficient to support clients attempting to locate general information about a subject or students enrolled in introductory level courses.

Level 2b Basic Information: Augmented

At this level, basic information about a subject is provided on a wider range of topics and with more depth. There is a broader selection of basic explanatory works, historical descriptions, reference sources and periodicals that serve to introduce and define a subject. This level is sufficient to support students in basic courses as well as supporting the basic information needs of clients in public and special libraries.

Level 3 Intermediate

A collection containing a broad range of resources adequate to support undergraduate and most postgraduate instruction, sustained independent study, work-based interests or specialized enquiries; that is, adequate to impart and maintain a knowledge of a subject in a systematic way at less than research intensity. It includes a wide range of basic works in appropriate formats, the fundamental reference sources and bibliographical works, a significant number of classic retrospective materials, complete collections of the works of more important authors, selections from the works of secondary writers, a selection of representative journals, and access to appropriate databases.

Level 3a Intermediate: Introductory

A collection at this level provides resources adequate for imparting and maintaining knowledge about the primary topics of a subject area. It includes a broad range of basic works in appropriate formats, classic retrospective materials, all key journals on primary topics, selected journal and seminal works on secondary topics, the fundamental reference sources and bibliographical works and access to appropriate databases. The collection is adequate to support undergraduate instruction, as well as most independent study and work-based needs of the clientele of public and special libraries. It is not adequate to support postgraduate courses.

Level 3b Intermediate: Augmented

A collection at this level provides resources adequate for imparting and maintaining knowledge about the primary and secondary topics of a subject area. The collection includes a significant number of seminal works and journals on the primary and secondary topics in the field, a significant number of classic retrospective materials, a substantial collection of works by secondary figures, works that provide in-depth discussions of research, techniques and evaluation, the fundamental reference sources and bibliographical works, and access to appropriate databases. The collection is adequate to support all undergraduate and most postgraduate coursework, as well as the more advanced independent study and work-based needs of the clients of public and special libraries.

Level 4 Research

A collection containing both current and retrospective resources, with historical material retained. Such a collection supports postgraduate and independent research and includes the major published source materials required. It includes all important reference works, a wide selection of specialized monographs, a very extensive collection of journals and immediate access to bibliographies, abstracting and indexing services in the field, materials containing research findings and non-bibliographic databases. The collection will provide materials in all appropriate formats and languages, including original materials and ephemera.

Level 5 Comprehensive

A collection that includes, as far as is reasonably possible, all significant works of recorded knowledge (publications, manuscripts, other forms) in all applicable languages, for a necessarily defined and limited field. This level of collecting intensity is one that maintains a special collection; the aim, if not the achievement, is exhaustiveness.

3. The purpose of the conspectus

The purpose of the conspectus approach is to distil complex relationships among library resources and plans for the collection into concise, internationally understood codes. Using an external standard for comparison, it applies standardized definitions to describe the strengths and weaknesses of a library's information resources. The conspectus approach is comprehensive, inclusive of the totality of information resources owned or accessed by the library in all formats. More recently, this has been defined to include electronic and remote-access electronic library resources. The conspectus has been adopted for use in all size and type of libraries, with any major standard classification scheme. The conspectus approach provide a collection-centred assessment of the current and existing strengths and weakness of the collection and resources devoted to maintaining the collection, yet suggests that plan for the future of the collection be client-centred, reflecting needs of the library's constituency as defined in the library's mission and reflected in the collection goals of the institutions. The Conspectus provides a systems approach to collection management. It is descriptive in nature, rather than prescriptive; it provides information about imbalances in the information resources system of the library.

4. Use of Conspectus in libraries

Use of conspectus methodology in diverse spheres of library operations has been documented in the literature. The conspectus can be a valuable tool within the library to support many internal activities. It can also be a valuable tool in external applications to communicate priorities and assist in planning at the local, regional, state, national or even international level.

The most frequently mentioned primary internal use of the conspectus is for the development of collection management policies. Information gained through analysis and description of collection components both informs and defines collection policy. The conspectus provides documentation of the library's collecting practices and goals. It provides a tool for internal library use in developing acquisitions policies, plans, priorities, and strategies, as well as in establishing preservation priorities and planning for weeding or storage. Conspectus is a very costly, labour intensive and time consuming tool and it requires substantial commitment on the part of the librarians before using. To gather what this tool can contribute we need to understand how it can be used productively in libraries to outset the costs involved in it. It's utility can be understood in the below mentioned ways.

4.1 Conspectus: Evidence of librarians as tool builders

The digital era has witnessed a shift from the industrial society to the information society. Perhaps librarians were among the original information workers, but today we are far from alone in this category. We can see the dramatic growth in information work reflected in the greater number of competitors that we have in the information field and in the rapid expansion of the information industry. If librarians are to assume their role as information leaders, we need to be the information provider, the one who creates the information product - the tool builder. Conspectus is that tool. Conspectus has related only to traditional library collections, that is, 'books on shelves'. It has been recognised, however, that for Conspectus to retain its utility as a library management tool it needs to take account of changes in library service provisions resulting from increased access to networked electronic information and the resultant change in focus in collecting from 'ownership' to 'access' of material.

4.2 Conspectus: a management tool

It is ironic that when the information age arrived it was also accompanied by a downsizing in resources available for traditional library and information services. Even so, there are tremendous opportunities for creating new roles in collecting, organising and providing access to electronic resources.

What makes the situation particularly difficult for library and information professional at this point is that libraries are truly in a transition time when neither print nor electronic resources can completely meet the needs of library users. There is pressure to maintain the known archival format and capital investments

in the technical infrastructure needed to deliver scholarly information electronically will be slow. In addition, there are economic pressures. In the face of continuously escalating costs and the volume of scholarly publishing, relentless inflation, soaring labour costs and declining budgets, library managers are finding that they must control their cost structures in order to remain economically viable. To do this, they need to balance a number of competing costs, - acquisitions versus preservation, books compared to serials, print versus electronic journal subscriptions, scholarly science journals with high use/high cost and increasing output with lesser-used journals, many with low prices and low inflation rates and in the social sciences and humanities. Add to these operational costs which are already being used to create economies of scale and reduce overall costs. Conspectus falls into this category.

The question is how does Conspectus compete, and this is where the argument comes in, that it is one of a series of tools that management can use in allocating available funds to meet the organisation's goals in fulfilling the client's need. Librarian's challenge is to prove the worth of Conspectus in terms that senior decision makers can most easily understand, and that requires couching it in financial terms, not process terms. Conspectus is a way of putting comparable, quantifiable value on a library's collection that users and senior decision makers can understand. Identifying a collection (not forgetting access to electronic resources) in terms of its strength, as able to support research in the field, for example, quantified in terms of a level 4, as compared to another at say the basic level, quantified as a level 2 and limited to general introductory works, provides instant recognition of a collection's worth and helps to quantify it in money terms, as either the failure to invest or the need to invest to bring it up to scratch if need be.

Conspectus has the added advantage as a management tool in that it can show whether the collection is adequate to support the teaching requirement. It can be used to expand the institution's teaching reputation or to push it to the level of a research institution. Conspectus can be used to prepare library impact statements on the ability of the collections to support new courses. It can be used in the accreditation process to identify areas in the collection relevant to the course, to identify areas of weakness and to provide the cost estimate to remedy the shortfall. It can also be used in estimating the cost of maintaining the collection at level. Conspectus can be used in conjunction with the library's Collection Development Policy to guide selection and acquisition to counter weaknesses identified by the collection assessment. The problem in the past has been in counting Conspectus as a cost, not as an asset, in not seeing it as integral to the organisation's achievement of its goals, both now and in the future. Conspectus is at the core of our business. It is a strategic business resource by which we can regularly evaluate and review the effectiveness and efficiency of our activities as part of a performance improvement cycle which, implemented regularly, will help to ensure:

- that client expectations are being met;
- the decision making processes are improved; and
- the allocation of scarce resources, which have and will continue to plague us.

Conspectus is our benchmark in measuring performance and testing cost and effectiveness. It is evidence of funds invested, of costs outlaid. The 'collection' (both as a physical entity and defined access to electronic resources), represents the return on investment and is also indicative of our ability to achieve our objectives. The goal is to find best practices that can be used to improve one's own work processes. Conspectus is total quality management. It is a continuous quality improvement. It is a challenge, it is a commitment, and it is control.

4.3 Conspectus: evidence-based practice

Evidence-based practice is all about basing service on systematic research. In the field of medicine evidence-based practice is the systematic analysis of scientific evidence to deduce 'best practice' guidelines. Librarians as information professionals have the knowledge, skills and facilities to ensure that their decisions are based on the best available evidence. That 'evidence' is Conspectus. The Conspectus methodology has enabled us to critically evaluate our collections to establish the extent of its strength. The fact that it is either a level 3 or a level 4 is evidence we can work on. Without such evidence how can we be sure we are serving our clients' needs? How else can we be accountable in the business sense?

5. Conclusion

A systematic 'conspectus' provides many indirect benefits like i) filling-in gaps in the collection, ii) justifying use of approval plans; identifying subject areas where curricular changes dictate that the library starts or stops buying materials, iii) justifying a grant application or budget increase for training, preservation or collection development, iv) defining possibilities for increased cooperative acquisitions among local or regional libraries in subject areas of mutual interest, v) fulfilling institutional or state mandated assessment programs, vi) providing 'objective evidence' for accreditation and professional association reports, vii) defining collection development objectives, policies, procedures and short and long range goals. Conspectus is considered as a standardised tool for the evaluation of library collections. It is a collection assessment method that maps subject strengths and weaknesses using standardised criteria and description. The purpose of this standardisation is to provide a composite picture of collection strengths and current collecting intensities. Conspectus has arrived at a time when there is seemingly endless search by libraries for methods that bring greater objectivity to the assessment of collections and hungry for standardisation in the field of collection evaluation. Conspectus is even believed to have the potential of becoming an internal evaluative tool when the quantified indicators of current practices are juxtaposed with projections of long-term needs.

Studying conspectus methodology can be extremely helpful to take a disciplined approach to collection development. The methodology is claimed to have been adopted and modified for use in libraries other than research libraries. As far as application of this methodology in other environment is concerned each library has to determine what will work in the given circumstances and adopt them to fit situation and no need to use every possible method or piece of data to determine collection levels. Libraries have to make their choice looking at the entire conspectus worksheet and not piece meal. Factors like growing literature, automated circulation systems and vendor services, trend of using conspectus divisions for comparable publishing and related date and continued efforts of validation studies have made data gathering and implementation of conspectus theory easier for those libraries who have already embraced.

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Different Aspects and Issues of Collection Management in Digital Environment for Library and Information Centers

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In the digital era of Information the job of collection management is really a tough job for library and information centers. Selection of materials for a library requires sagacity, adroitness and attention to people's needs for everything from books, periodicals etc. It requires sagacity, adroitness and attention to people's needs for collection of e-resources everything in the form of books, periodicals etc. For this purposes collection development and collection management policy required in the development of e-resource. The present article trying efforts to highlights different aspects related to collection management in the digital environments.



Collection Management, E-Resources, Library and Information Centers, Collection Development Policy.

1. Introduction

Information explosion and the information revolution have occurred in the last three decades. But the advent of Information and Communication Technologies, the Internet and particularly the World Wide Web has revolutionized literally everything in Information management. The Libraries and Information Centers have been the biggest beneficiaries. These technologies have emerged as boons to us. A job that hitherto used to take hours, days and weeks, is now just a mouse click away. The publishers round the globe have reaped the advantage of these technologies to an increasingly appreciable extent and brought in a plethora of electronic resources in abundance. This has consequently resulted in a paradigm shift in the original philosophy of actual possession of resources to actual access of the same. For this purposes it is naturally the collection development in the electronic environment had to metamorphose Digital resources represent an increasingly important component of the collection management activities of libraries. "Electronic resources" refer to those materials that require computer access, whether through a personal computer, mainframe, or handheld mobile device. They may either be accessed remotely via the Internet or locally. Digital resource has transferred the society of people into information savvy. It has spreads its tentacles to the entire community irrespective of their location viz. far and near, to facilitate electronic media to work, knowledge resources have necessarily to be converted from print media to machine readable data thus paving the way for emergence of e-resources. A digital library collection contains fixed and permanent documents available in the digital format. It contains different types of materials that include multimedia objects representing different subject fields. Some digital library collections may be already in digital form while others are digitized from their analogue versions.

2. Collection Development and Collection Management

The collection development and collection management is quite often almost interchangeably used but they differ. Collection development is the selection and acquisition of library materials, considering users' current needs and future requirements. But collection management is much more than collection building alone. It involves managing the use of the collection, its storage, its organization and making it accessible to users. Because of paradigm Shift in the role of librarianship, librarians at present are more concerned with collection management than collection development. They are acting increasingly as interpreters of information, rather than as selectors. They have to act as "knowledge managers" rather than "collection managers". Though substituting "knowledge" for "collections" has moved the focus away from the development of local print collections, the librarian is still responsible for surveying the entire universe of information resources (now both in print and e-form) and then selecting, organizing and preserving the resources constituting the record of knowledge. (Branin, 1994).

3. Collection Development Policy

Collection development policy is the vehicle through which the library archives the goals of its reader's services. Ikem, (1995). Proper budgeting and careful operation are vital to the success of library services activities. It should be used as a planning and monitoring instrument. Just as no group of activities can succeed without proper planning, so also the activities of meeting user's needs cannot succeed without proper policies and monitoring. Collection development requires A well written policy to analysis of user needs. It requires Inter- and intra-library communication policy development, Budgeting and allocation of resources, Contract negotiations; Macro-evaluation of collections, Micro-evaluation for selection, preservation or withdrawal of stock, Documents selection tends to be a group activity rather than an individual activity.

The word "policy" means a set of guidelines designed and developed for a specific purpose. Policy is formulated with an organization's mission statement and strategic plan in mind. Collection management policy should be linked very closely to the general and specific programs of the organization and should be in conformity with the information needs of the user population. Good policy can ensure consistency of approach among staff and serve as a planning tool for managers. It should establish priorities for both policy makers and policy executors. It must have a corollary archiving policy to assure the preservation of information and permanent perpetual access to future information seekers. Collection acquisition and implementation increasingly complex raising ongoing staffing and workflow issues. (Geller, 2006) has put it "the electronic resources ,at the selection stage , must meet a set of criteria in addition to those we set up for print, and while it is still in the selection stage, this decision involves expertise and input from library staff members beyond the subject selector group."

Collection development and management Policy must include following basic required statements:

- General Statement
- Definition
- ER to be collected along with exclusion
- General selection criteria for electronic resources
- Specific selection criteria for electronic resources/databases
- Procedure for evaluation of Non-reference electronic resources
- Implementation
- Networking and duplication
- Replacements
- Gifts
- Withdrawals / Deselection
- Funding
- Licensing
- Policy review

4. Criteria for Document Selection

In addition to input from faculty, the following criteria are used as guides when selecting titles for the collection, developing the reference collection, developing new areas in the collection, filling in identified gaps in the collections, and doing retrospective collection building:

- The relevance of the titles to the scholarly needs of students in the context of the present curriculum.
- The author's reputation and significance as a writer.
- The title has received favorable critical reviews from reputable sources.
- The reputation of the publisher or producer of the titles is one of high quality subject content and good quality physical product.

- The title is included in lists of works important in the field.
- The title is recommended in standard library evaluation material.
- The subject matter is presented at a level which is appropriate to undergraduate students.
- Timeliness of material.
- Permanence of material.
- Will material serve the interests of students in more than one discipline or programs?
- The price of the title is within the range to be expected for materials of its type.

According to Forester and Rowland (1998) and Rowley (1998) the following important issues should be considered when selecting an online search service:

- Number of databases offered,
- Search and retrieval facilities,
- Search interfaces (simple and advanced user interface),
- Database structure and record formats,
- Cost,
- Time required to develop searching facility,
- Cross database searching facility/ cross linking
- Communication facility,
- Support services, and
- Additional facilities such as current awareness services.
- Usage reports

5. Changing Criteria in Management of Collection Development

Important guidelines have been suggested by eminent scholars for the selection of library materials in the Traditional Library environment. They are:

- The authority of creations (Author, Publishers, etc.)
- Scope (the breadth and depth of coverage)
- Treatment and level (Suitability for the intended audience)
- Arrangement (Organization of Content)
- Format (Accessibility , search ability, readability, portability, durability etc)
- Special features (What shows their individuality)

The following major factors are considered to be more useful for selecting digital information sources.

- Hardware, software and network requirements
- The content of digital networks
- The version of the product
- The number of concurrent users allowed
- Access control through password, proxy server, authentication etc.
- Price, licensing and copy right agreement
- Database features, the retrieval engine and user interfaces
- Ease of use and user training
- Archiving and preservation of the digital information sources

7. **Basic Critical Issues in E-Resources:** Some of the basic critical Issues e-resources are:
    - Lack of uniformity
    - Interoperability issues
    - Lack of standardization
    - Integration
    - Arbitrary price structure
    - Intake, processing and utilization of Usage data
    - IPR Issues: now more alarming License agreements,
    - Continuing financial commitments
    - Cancellation limits
    - Perpetual access and rights

7. Some Critical Aspects and Issues in Digital Resources collection Management

- **Selection:** is one of the first issues for selectors in the digital information age. Due to the nature of license agreements that changed the control Libraries had over the product whether or not to purchase these materials. Another issue is to involve the appropriate technical specialists, in addition to subject selectors, in the decision-making process due to the complexity of making these new materials available to use. (Davis, 1997). Curricular diversification and limited financial resources necessitate the careful selection of materials to meet the needs of existing academic departments as well as new program areas.
- **Deselection:** The removal of outdated, duplicated, mutilated or superseded materials is an essential component of maintaining a healthy, usable library collection. When executed properly, deselecting presents the academic community with a collection that is up-to-date and evolving to meet the needs of a dynamic and changing curriculum with less chance of the uninformed encountering inappropriate materials.
- **Budget:** Electronic resources consuming an ever increasing share of library budgets often to the detriment of monographic acquisitions. Librarian's concern: what resource to require and in what format? Price is both simplest and trickiest factor as budget will determine whether or not go for purchase. Librarians when planning to purchase e-resources should compare traditional and electronic form of resources in terms of cost effectiveness and anticipated usage. They must reserve a significant portion of its acquisition budget for access to alternate sources of information both print and electronic.
- **Acquisition:** process of acquisition is more complex for e-resources and including liaising with suppliers, organizing trials and demonstrations and formal evaluation. Once a decision is made, it is ironic that the acquisition of e-resources can often take longer the paper ones. At time just getting a price from suppliers can take more than a few weeks. Perhaps the reason for these delays is due to the inexperience both of publishers and librarians. It can frustrate the anticipation of users. The collections of Library, including digital products that are not physically owned or stored within the library building, are carefully selected to support the teaching, research and service.
- **User Interfaces and Human-computer Interaction issues:** while digital environment, user interfaces and interaction with human-computer issues are an extensive field of research in their own right, there are some specific problems that are central to progress in digital libraries. Display of information, visualization and navigation of large information collections, and linkages to information manipulation/analysis tools were identified as key areas for research. The use of more sophisticated models of user behavior and needs in long-term interactions with digital library systems is a potentially fruitful area for research.

- **Technical Specification:** before selecting e-resources, technical ease and accessibility, technical compatibility with library's and/or future hardware and software must be checked. For successful usages of e-resources, proper training must be given to both library staff and users. Technology obsolescence is yet another area of grave concern for libraries.

- **Social, Economic and Legal issues:** digital libraries are not simply technological constructs; they exist within a rich legal, social, and economic context, and will succeed only to the extent that they meet these broader needs. Rights management, economic models for the use of electronic information, and billing systems to support these economic models will be needed. User privacy needs to be carefully considered. There are complex policy issues related to collection development and management, and preservation and archiving. The social context of digital documents, including authorship, ownership, and the act of publication, versions, authenticity, and integrity require a better understanding.

- **Intellectual Property Rights:** is a term referring to a number of distinct type of legal monopolies over creations of mind, both artistic and commercial, and the corresponding field of law. Under intellectual property law, owners are granted certain exclusive rights to a variety of intangible assets, such as musical, literary, and artistic works, discoveries and inventions, and words, phrases, symbols , and designs. Common types of intellectual property include copyright, trademarks, patent, industrial design, and trade secrets etc.

- **Copyright:** with the digital technology and new communication systems the scope of violation of IPR particularly copyright is unlimited. Under the Indian copyright act, 1957 the user are permitted faire use i.e. non commercial personal use for academic purpose not amounting to violation of copyright. Libraries are prohibited to provide services of leased digital products through internet, even downloading the information for forwarding through email in not permissible. Thus, the e-resources warrant strict observance of the copyright laws and the licensing agreements. Copyright is a form of intellectual property that gives the author of an original work exclusive right for a certain time period in relation to that work, including its publication, distribution and adaptation, after which time the work is said to enter the public domain. Copyright applies to any expressible form of an idea or information that is substantive and discrete and fixed in a medium. Some jurisdictions also recognize "moral rights" of the creator of a work, such as the right to be credited for the work. Copyright is described under the umbrella term intellectual property along with patents and trademarks.

- **Trademarks:** A trademark or trade mark is a distinctive sign or indicator used by an individual, business organisation, or other leagal entity to identify that the products or services to consumers with which the trademark appears originate from a unique source, and to distinguish its products or services from those of other entities. A trademark is designated by the following symbols:
  - ™ (for an unregistered trademark, that is, a mark used to promote or brand goods)
  - SM (for an unregistered service mark, that is, a mark used to promote or brand services) ® (for a registered trademark)

- A trademark is a type of intellectual property, and typically a name, word, phrase, logo, symbol, design, image, or a combination of these elements. There is also a range of non-conventional trademarks comprising marks which do not fall into these standard categories. The owner of a registered trademark may commence legal proceedings for trademark infringement to prevent unauthorized use of that trademark. However, registration is not required. The owner of a common law trademark may also file suit, but an unregistered mark may be protectable only within the geographical area within which it has been used or in geographical areas into which it may be reasonably expected to expand. The term trademark is also used informally to refer to any distinguishing attribute by which an individual is readily identified, such as the well known characteristics of celebrities. When a trademark is used in relation to services rather than products, it may sometimes be called a service mark, particularly in the United States.

- **Patents:** usually refers to a right granted to anyone who invents or discovers any new and useful process, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof. The additional qualification utility patent is used in the United States to distinguish it from other types of patents (e.g. design patents) but should not be confused with utility models granted by other countries. Examples of particular species of patents for inventions include biological patents, business method patent, chemical patent and software patent.
- **Industrial Design Right:** is an intellectual property right that protects the visual design of objects that are not purely utilitarian. An industrial design consists of the creation of a shape, configuration or composition of pattern or colour, or combination of pattern and colour in three dimensional forms containing aesthetic value. An industrial design can be a two-or three-dimensional pattern used to produce a product, industrial commodity or handicraft.
- **Trade Secrets:** trade secret is a formula, practice, process, design, instrument, pattern, or compilation of information which is not generally known or reasonably ascertainable, by which a business can obtain an economic advantage over competitors or customers. In some jurisdiction, such secrets are referred to as "confidential information" or "classified information".
- **Licensing:** is a legal document showing that permission has been granted to do, own or use something. A library has to deal with the license agreements made with various vendors or publishers on order to provide access to online full text or bibliographical databases and journals. The e-journals are made available through the web at varying pricing models. The e-journals may be offered free with print subscription or offered at a fixed percentage over print subscription or be offered exclusively in electronic media. (Jeevan, V.K.L., 2003)
- It is the most pertinent and crucial to us among all IPRs particularly in the electronic environment today is: License Agreement. (Duranceau, 2000) has expressed "Libraries now exist in the licensed world". Licenses are of most concern to most libraries because they may determine who may use a given resource, what use may be made of its contents, and what the consequences of unauthorized use might be -including possible legal and financial penalties. The development of linking technologies and standards like Open URL and DOI (Digital Object Identifier) have enable libraries to provide extensive links among all kinds of DBs. These technologies and the Proxy servers have made it possible for libraries to offer federated or Meta search services that search multiple databases simultaneously.
- **Fair Use:** is essentially a limitation on the exclusive rights of the copyright holder to reproduce a protected work. It allows you to reproduce copyrighted material without obtaining the right holder's consent. To determine whether the use is indeed fair, four factors must be considered-
    - the purpose and character of the use including whether such use is of commercial nature or is for non profit educational purposes;
    - the nature of the copyrighted work;
    - the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
    - the affect of the use upon the potential market for or value of the copyrighted work.
- **Preservation of Digital Resources:** The preservation of digital content for long periods of time, across multiple generations of hardware and software technologies and standards is essential in the creation of effective digital libraries. This is an extraordinarily difficult research problem, which has not received sufficient attention. The digital preservation or archiving is step to insure long term access to e-resources. The technology obsolescence has posed a serious threat to the durability and accessibility of such resources. To say that a particular resources is a part of library's collection. If should be accessible when demanded. Through very expensive, the preservation techniques like migration, emulation, are being used by librarian for long term archival purposes.

8. Conclusion

In the modern era of digital environment collection management which is much wider in scope. Due to the advent of information communication technologies a revolutionary change profoundly affecting the library's landscape. Collection management of electronic resources includes various activities like selection, evaluation, trial, acquisitions, licensing, access, promotional activities etc. All activities are interrelated. A library requires trained staff, excellent guidance and legal consultancy to perform aforesaid activities. Some of the libraries are for the specialized users, having collections of specialized materials to support the research programs of their parent organization. They usually build- up collection of current literature comprise, e-books, e-journals, books, periodicals, government publication, reports etc. Interoperability is likely to continue to be a useful organizing theme. It suggests that a focus on broad architectural issues in digital libraries will be fruitful. Several working groups commented on the need to develop component software strategies that would facilitate the transfer of technology among the current digital library pilot projects and from these projects to other new digital library research efforts. The Internet working group went further in suggesting that the development of a broadly available software base for the digital library community would contribute to rapid progress, and we believe that this suggestion deserves careful consideration. In the current electronic information environment, emphasis is towards excellent collection development and management required than large collection and developing effective means of getting access to remote collection or databases. One of the major aspects and issues are the balance between print and electronic services. The librarians must keep in mind the need of the patrons as well as the resources of the library as they built digital collections and their management to prepare for accessing.

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Digitisation of Local Collection of Information in Library using DSpace

Reji Tomlal



The digitisation programmes can raise the profile of an institution. Projects to digitise priceless national treasures or valuable scholarly materials, if done well, can bring prestige to the whole institution. Raising the profile of an organization by showcasing digital collections can be a useful public relations exercise. Digital collections can also be used as leverage with benefactors and funders by demonstrating an institutional commitment to education, access and scholarship. Information is the vital element for any organization or institution. Apart from the fixed knowledge source of information, there are so many information has been getting through Reports on Talks, Seminars and Exhibitions which are conducted regularly by the various Department Associations, Reports on Alumni Association, Placement Cell activities, Parent Teacher Association meetings, Centralised Students' Grievance Redressal Cell Committee meetings, IEEE Chapter, History of Academic Excellence on each Engineering Colleges, Anti-Ragging Committee, College Development Council meetings, Women's Forum activities, TEQIP-Phase II meetings, etc. If this information is to be digitalise, then it can be made available to any one at any time, any where and these information mean to call as Local collection of information



Digitisation programme, e- resources,

1. Introduction

Information is a vital resource for national development. Increasing realization of the role of information has resulted in the establishment of information systems to provide a variety of information services and products. It is an essential step in the planning, designing, and use of such services and products for optimal use of information. Library acquisition, organization and dissemination must be based on the modern concept of marketing to achieve reader satisfaction. It must endeavor to nurture culture of customer service to enhance its image in the eyes of the users.

Digitisation is the process by which analogue content is converted into a sequence of 1s and 0s and put into a binary code to be readable by a computer. Digital information has common characteristics and qualities, regardless of whether the content is stored on DVD, CD-ROM or other digital storage media. It can be linked to other materials to create multimedia and can be stored and delivered in a variety of ways. The Digital content can be browsed easily, and can be searched, indexed or collated instantly. Digitisation contributes to the conservation and preservation of heritage and scientific resources and it creates new educational opportunities. It can be linked to a whole 'web' of other content, either locally or globally via the internet The use of technology has become a core part of the institutional mission of museums, archives and libraries around the world.

As libraries shift more services to the internet, the library web site becomes increasingly important as a product (service) in its own right and as a major tool in marketing other products of the library. Libraries can use the Web to provide services, to market services, or as part of the marketing process. The advent of new technologies such as dramatic increase of digital storage media; convergence of telecommunication and broadcasting, the availability of wealth of information resources accessible through the Internet and also reduction in cost of computers in the market place, make it possible for librarians to introduce IT products and services to fulfill information needs of their customers. A digital library is a library in which collections are stored in digital formats and can be accessible by computers. The content may be stored locally, or accessed remotely. Rapid advances in information technologies have revolutionized the role of libraries. As a result, libraries face new challenges, competitors, demands, and expectations. Libraries are redesigning services and information products to add value to their services and to satisfy the changing information

needs of the user community. Traditional libraries are still handling largely printed materials that are expensive and bulky. Information seekers are no longer satisfied with only printed materials. They want to supplement the printed information with more dynamic electronic resources. Demands for digital information are increasing. DSpace is one of the open source repository software packages typically used for creating open access repositories for scholarly and/or published digital content. The DSpace repository software serves a specific need as a digital archives system, focused on the long-term storage, access and preservation of digital content.

The problem of difficulty to access the local collections, lack of an efficient digital library software's integrated with various information resources available in libraries are the challenges facing users in the existing Engineering College Libraries in India. The turning point for the above mentioned challenges is to establish digital library using efficient popular open source software named 'DSpace'. The study calls for deliberate action to implement digital libraries especially in Engineering Colleges in order to harvest the prospects of digital libraries in enhancing access to learning materials and consequently improving students' academic performance.

The library can be called an information market and the library user is a consumer of information. Information is a vital resource for national development. Increasing realization of the role of information has resulted in the establishment of information systems to provide a variety of information services and products. It is an essential step in the planning, designing, and use of such services and products for optimal use of information. Library acquisition, organization and dissemination must be based on the modern concept of marketing to achieve reader satisfaction. It must endeavor to nurture culture of customer service to enhance its image in the eyes of the users.

2. Background of the Problem

The number of students enrolled to Professional Engineering Colleges increases with years which entail the increasing library users. With the increasing library users it is mandatory to increase library resources such as librarians, seating spaces, and library materials including local collections of information. To increase seating space for example, is likely to need physical expansion of the libraries. It is high time them to look if the existing libraries suffice with the present trend. With the presence of digital libraries we can be assured of access to academic materials at anytime and anywhere.. The problem of difficulty to access the abstract information of printed back volumes of B.Tech & M.Tech students' project reports such as Major Projects, Minor Projects, Seminar Reports of every year, difficulty to access other local collections which includes, Journal articles: National & International, Magazines' informative articles, Committee meetings & Minutes, Conference presentation papers, Course syllabi, Departmental workshops, Doctoral Dissertations, Documents, Drawings, Faculty agenda and minutes, Institution's alumni publications, Course notes, Library committee meetings & Minutes, Maps, Master's theses, Newspaper clippings, Sound recordings of interview, Special collections, Student papers, Thesis abstracts, Vedeo recordings, Working papers, Other learning objects prepared by staff. The lack of an efficient digital library software integrated with various information resources were also observed to be challenges facing users in the existing Engineering College Libraries in India. The turning point for the above mentioned challenges is to establish digital library using an efficient popular open source software named 'D Space'.

Information is an indispensable factor for promoting the development of society. Kemp (1976:101)1 observes, that information has been called, the fifth need of man, ranking after air, water, food, and shelter. Luck, et al., add that information is the life blood of planning, directing, and controlling any enterprise (Luck et al, 1981:20). It makes the satisfaction of the demands of the population possible in an efficient way.

The present age is rightly characterized as the age of information, where it success in any activity is based on the amount and accuracy of information available. The fact that information is a key resource for the progress and development of a nation (Raina, 1998:3) is nothing but the socio-economic, cultural, and political development of its citizenry. Information is a commodity or economic good of worldwide

3. Information Products nd Services

According to Marc Porat "Information is a collection of many heterogenous goods and services that together comprise an activity in the economy." Information as a commodity is thus, represented by the products, services systems and channels which carry information. Libraries and other non-profit organizations have only recently become aware of the need to market their products and services. Library and information products and services are now being recognized as commodities that can be sold, exchanged, lent, and transmitted. Marketing is an integral part of library service, because it has to do with basic principles of librarianship i.e. to develop good collection and user-oriented services.

A product is anything that can be offered to a market to satisfy a need. A large assortment of materials, services, and programmes constitute the library's product. A library offers goods, either tangible (e.g. books and Internet access) or intangible (e.g. personal assistance, or value of the library as a premier community institution). De Aze (2002: 5) says that, "products and services which provide benefits for users and which answer users' most important needs are the core business of the library and information service" (Aze de Elliot E.2002: 5). Seetharama (1998) considers that, without products no organization has reason to exist, there is no task to perform; hence product is the most important factor in marketing, and Weingand (1995:307) asserts that, the library's product can be arranged within a three dimensional structure of the product mix, product line, and product item. Programmes of the library are a product line where product items consist of bibliographic instruction, displays, and lectures. Traditional libraries are limited by storage space; digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain it. As such, the cost of maintaining a digital library can be much lower than that of a traditional library. A physical library must spend large sums of money paying for staff, book maintenance, rent, and additional books.

Information as a commodity is represented by the products, services and channels which carry information. Information products and services like any other commodity are demanded in the market and the demand is affected by factors like Price, Preferences, Income, Expectations, Population, Seasons, Technology and Price of other goods. Information is demanded only when there is value or utility to the consumer.

The supply of information products and services depends on the price of the product , the cost involved in its production and the technology used. Libraries, Information Centers, Information Analysis Centers, Referral Centers etc. function as the distribution channels for information products and services. Information products comprise three types of documents: Primary, Secondary and Tertiary. Primary information is newly generated information and therefore the documents which record and disseminate or communicate it, are known as primary documents. Primary documents include: Journals, Newspaper, news-magazines, conference proceedings, annual reports, research monographs, pamphlets, working/ discussion papers, report literature, thesis, dissertation, government publications, standard specifications, patents, manufacturer's literature, maps, charts, atlases, engineering drawings etc. Secondary nformation is derived from primary information and the documents in which they are recorded are known as secondary documents. Secondary documents are created to facilitate access to information contents of primary documents. Secondary documents includes: indexing serials, abstracting serials, current awareness serials, review serials, book review serials, news digests, translation journals, reference books, library catalogues, accession lists, etc. Tertiary documents are those that record information about secondary documents. They facilitate access to secondary documents. Tertiary documents include: Bibliography of bibliographies, literature guides, directories etc.

Information as a commodity is represented by the products, services and channels which carry information. Like any other commodity, information gets produced as a result of activities and events that take place in every day life. Growing recognisation of its role as a vital input to the economic, cultural and sociological progress of humanity is causing more and more attention to be paid to methods of information access and use, resulting in the development of an organization.

4. Information as a Markatable Commodity

Information is gradually getting importance as a marketable commodity. Information like any other commodity gets produced, sold and consumed. It is therefore a tradable commodity which is exchanged in the market in the form of information products and services. According to Philips Kotler marketing refers to " the analysis, planning, implementation and control of carefully formulated programs designed to bring about voluntary exchanges of values with target markets for the purpose of achieving organizational offering in terms of the target market needs and desires on using effective and service the markets".

- **Role of a Library and Information Centers:** All the information produced in the society gets accumulated in libraries and information centers. With the information explosion, it has become difficult for the users of information to go through all these and extract the relevant ones. In this respect, library and information centers play an important role by collecting the information, processing it and supplying it according to the specific needs of the users. Thus libraries and information centers play an important role in the production of secondary information. The process of information generation or production is a continuous one. With the advancement of electronic technology and tremendous growth of population, the amount of information produced and transmitted has grown at an explosive high rate causing an information explosion.

5. Digitisation

The advantages of digital document collections over paper collections are generally well recognized and accepted today. Digital records are much easier to preserve, backup, organize, share and enjoy. And once digitised, the record image will no longer fade and deteriorate. All or part of a collection can be placed on the Internet or in open source software such as DSpace, Green Stone, etc. for access anytime and anywhere. The cost of duplicating and backing up the collection in multiple locations becomes a fraction of the cost of backing up a large paper collection. Digital records provide easier access points and significantly reduced amounts of physical storage space. Digital images also provide accessibility to images by those who can use the documents. This means that family histories will be better documented, with citations and links to the actual images. This brings a new dimension to family history, where not only the conclusions, but also the actual images used in making those conclusions are part of the family historian's record. The biggest plus is however, that organization and searching of a collection is greatly facilitated.

6. Needs for Digitisation: There are three main needs for digitization. They are as follows.

- To preserve the Documents: That is to allow people to read older or unique documents without damage to the originals. These unique documents are sometimes called the heritage documents.
- To make the documents more accessible: This is to serve the existing users better; e.g. to allow the users to search the full text of the documents or to serve more users than envisaged in remote locations, example, more than one person at a time.
- To reuse the documents. It means to convert documents into different formats; for example to use images in a slide show and to adopt the content for a different purpose.

7. Local Collections of Information

Information is the vital element for any organization or institution. Apart from the fixed knowledge source of information, there are so many information has been getting through Reports on Talks, Seminars and Exhibitions which are conducted regularly by the various Department Associations, Reports on Alumni Association, Placement Cell activities, Parent Teacher Association meetings, Centralised Students' Grievance Redressal Cell Committee meetings, IEEE Chapter, History of Academic Excellence on each Engineering Colleges, Anti-Ragging Committee, College Development Council meetings, Women's Forum activities, TEQIP-

Phase II meetings, etc. If this information is to be digitalise, then it can be made available to any one at any time, any where and these information mean to call as Local collection of information. Hence, the local collection of information can be generated through the following categories.

- **Catagories of Local Collection of Information / Document**

Local Collections of Information Sources			
1	Journal articles: National & International	12	Library committee meeting & Minutes
2	Committee meeting & Minutes	13	Maps
3	Conference presentation	14	Master's theses
4	Course syllabi	15	Newspaper clippings
5	Departmental workshops	16	Sound recordings of interview
6	Doctoral Dissertations	17	Special collections
7	Documents	18	Student papers
8	Drawings	19	Theses abstracts
9	Faculty agenda and minutes	20	Video recordings
10	Institution's alumni publications	21	Working papers

- **Library**

Library is a part and parcel of any educational set-up. Due to the growth and the development of the society, information is produced /generated and these are published in the form of print and non-print forms and which are scattered in different types of documents in libraries and information centers. In traditional library system, the overwhelming of document/books creates difficulties to find the right information so speedy.

Libraries and information centers are facing a time of unprecedented change and challenge. Recent technological developments are creating new forms of information, and new ways of providing information by passing traditional institutional like libraries. There has been an increasing pressure on libraries to mobilize resources and become self-reliant. Library users are transforming into customers with rising expectations, diverse needs and wants, and choices. Now, the real challenge for library and information professionals is not to manage the collection, staff and technology but to turn these resources into services. The notion of services has also changed, from basic to value added, from staff assisted to self -service, from in-house to outreach, from free to priced, from reactive to pro-active, and from mass customization to individualized service. Libraries in advanced countries are begun to undertake digitalization projects to convert their national in-prints into digital formats, some make them available through the internet. Library is "reservoir of knowledge" must market its IT products and services in order to reach out to its potential users. Librarianship is experiencing rapid change. Information technology has created a new gateway for information services.

- **Modern Library**

The implementation of Information and Communication Technology, in the routines of the library activities facilitates users to manage knowledge. Modern librarians ensure that the Right information is delivered to the Right person in the Right time in order to take the most appropriate decision. This also complies with Dr. S.R. Ranganathan's Fourth Law of library science, stated above. The Knowledge Management system is developing rapidly in the present era in the form of collection of data or knowledge information.

The digitisation process helps the knowledge information to be shared with other people through Internet / intranet. Information and Communication Technologies in a library, are applied to the following activities, viz. Library Automation (acquisitions, cataloguing, circulation and OPAC), Digital Library (CDs, DVDs, Microfilm, E-Books, E-Journals, Databases, etc.)

Library Co-operation and Resource Sharing (Inter- Library loan), Networked digital information resource sharing (web OPAC, SDI, CAS, Article alert service), Ready Reference Services, E-Reference Services are important library services in modern libraries. All documents preserved in the library in the book form are changing into digital form by scanning the materials and converted into CD/DVD devise.

The Social impact and influence of digitisation has increased rapidly in the fast moving world. The internet and on-line learning are currently in sharp public focus and define today's popular perceptions of educational technology, E-learning, E-book etc. It is a searchable version in the computer that enhances the knowledge management tasks in the digital era. The librarians today recognise their role more as a custodian of knowledge. Library expectations might not match realities of day to day work or existing values and norms.

Specialised libraries are focusing on preserving the decades of information, photographs/ Image style / costumes/ seasons of information in the digital form for easy access by the users anywhere in the world. In academic libraries, the reports / dissertation projects / publications are digitised and they can be viewed online by using the web OPAC software which is commonly used by students/researchers/scholars. Knowledge technologies are serving, without doubt, the establishment of a global society where the traditional boundaries of time and space have melt to make way for a world within reach of anyone who has the knowledge, resources and skills needed for information management. Social demand for environment friendly digital libraries is rapidly increasing in our modern world. Academic Libraries play an extraordinary role in educating and empowering citizens. They help individuals and communities to become more knowledgeable, aware and imaginative.

Information technology encourages users to search information to retrieve the required information. It also helps the knowledge economy by promoting more of knowledge management, more of Open Source Software such as DSpace, Green stone etc., more of knowledge sharing and R&D of knowledge management. However, the digital library can enhance traditional libraries but can not replace them. If we were to replace the entire library into digital form, all stored in a reader, the end result of delivering the content may be the same or even better, but the feel would be missing.

- **Function of Digital Library**
  - Access to large amounts of information to users wherever they are and whenever they need it.
  - Access to primary information sources.
  - Support multimedia content along with text
  - Network accessibility on Intranet and Internet
  - User-friendly interface
  - Hypertext links for navigation
  - Client-server architecture
  - Advanced search and retrieval.
  - Integration with other digital libraries.

- **Purpose of Digital Library**
  - Expedite the systematic development of procedures to collect, store, and organize, information in digital form.
  - Promote efficient delivery of information economically to all users.
  - Encourage co-operative efforts in research resource, computing, and communication networks.
  - Strengthen communication and collaboration between and among educational institutions.
  - Take leadership role in the generation and dissemination of knowledge

- **Advantages of a Digital Library:** The advantages of digital libraries include
  - Nearly unlimited storage space at a much lower cost
  - Re-allocate funds from some staff, collection maintenance, and additional books.
  - No physical boundary
  - Round the clock availability
  - Multiple access
  - Enhanced information retrieval.
  - Preservation for some print material
  - Added value
  - Universal accessibility

- **Digital libraries bring significant benefits to the users through the following features:**
  - **Improved access**: Digital libraries are typically accessed through the Internet and Compact Disc-Read Only Memory (CD-ROM). They can be accessed virtually from anywhere and at anytime. They are not tied to the physical location and operating hours of traditional library.
  - **Wider access:** A digital library can meet simultaneous access requests for a document by easily creating multiple instances or copies of the requested document. It can also meet the requirements of a larger population of users easily.
  - **Improved information sharing:** Through the appropriate metadata and information exchange protocols, the digital libraries can easily share information with other similar digital libraries and provide enhanced access to users.
  - **Improved preservation:** Since the electronic documents are not prone to physical wear and tear, their exact copies can easily be made, the digital libraries facilitate preservation of special and rare documents and artifacts by providing access to digital versions of these entities.

- **Functional Components of Digital Library**

  Most digital libraries share common functional components. These include:
  - **Selection and acquisition:** The typical processes covered in this component include the selection of documents to be added, the subscription of database and the digitization or conversion of documents to an appropriate digital form.
  - **Organization:** The key process involved in this component is the assignment of the metadata (bibliographic information) to each document being added to the collection.
  - **Indexing and storage:** This component carries out the indexing and storage of documents and metadata for efficient search and retrieval.
  - **Search and retrieval:** This is the digital library interface used by the end users to browse, search, retrieve and view the contents of the digital library. It is typically presented to the users as Hyper-Text Mark-up Language (HTML) page.

These mentioned components are the important characteristic of digital library, which differ it from others collections of online information.

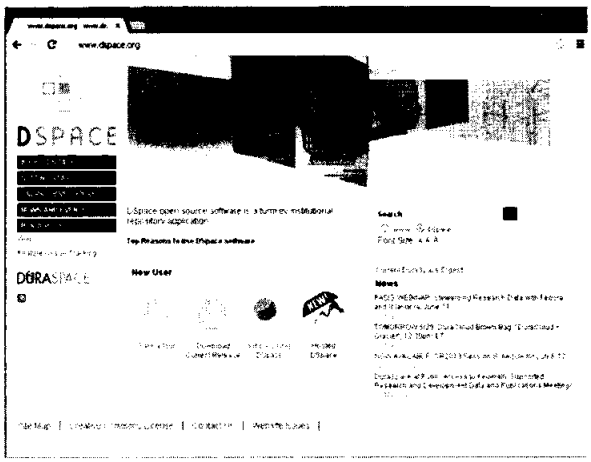
DSPACE : DSpace is an open source repository software package typically used for creating open access repositories for scholarly and/or published digital content. While DSpace shares some feature overlap with content management systems and document management systems, the DSpace repository software serves a specific need as a digital archives system, focused on the long-term storage, access and preservation of digital content.

The first public version of DSpace was released in November 2002, as a joint effort between developers from MIT and HP Labs. Currently the DSpace software and user community receives leadership

and guidance from DuraSpace. DSpace is a set of cooperating Java web applications and utility programs that maintain an asset store and an associated metadata store. The web applications provide interfaces for administration, deposit, ingest, search and access. The asset store is maintained on a file system or similar storage system. The metadata, including access and configuration information is stored in a relational database and supports the use of PostgreSQL and Oracle database.

DSpace currently support two primary web interfaces: JSPUI which uses JSP and the Java Servlet API and XMLUI (aka Manakin) based on Apache Cocoon, using XML and XSLT. DSpace holdings are made available primarily via a web interface, but it also supports the OAI-PMH v2.0, and is capable of exporting METS (Metadata Encoding and Transmission Standard) packages. DSpace supports the common interoperability standards used in the Institutional repository domain, such as Open Archives Initiative Protocol for Metadata Harvesting, SWORD, OpenSearch, and RSS. More recent versions of DSpace also support faceted search and browse functionality using Apache Solr. DSpace is the software of choice for academic, non-profit, and commercial organizations building open digital repositories. It is free and easy to install "out of the box" and completely customizable to fit the needs of any organization.

The web site of DSpace shows in the diagram stated below



The following diagram shows a brief explanation about the DSpace

DSpace

Original author(s)	MIT and HP Labs
Developer(s)	DuraSpace
Initial release	November 2002
Stable release	3.1 / 31 January 2013; 3 months ago
Development status	Active
Written in	Java
Operating system	Cross-platform
Type	Institutional repository software
License	BSD licence
Website	www.dspace.org

Fig.2 DSpace Information

DSpace preserves and enables easy and open access to all types of digital content including text, images, moving images, mpegs and data sets. And with an ever-growing community of developers, committed to continuously expanding and improving the software, each DSpace installation benefits from the next. DSpace is free available as open source software

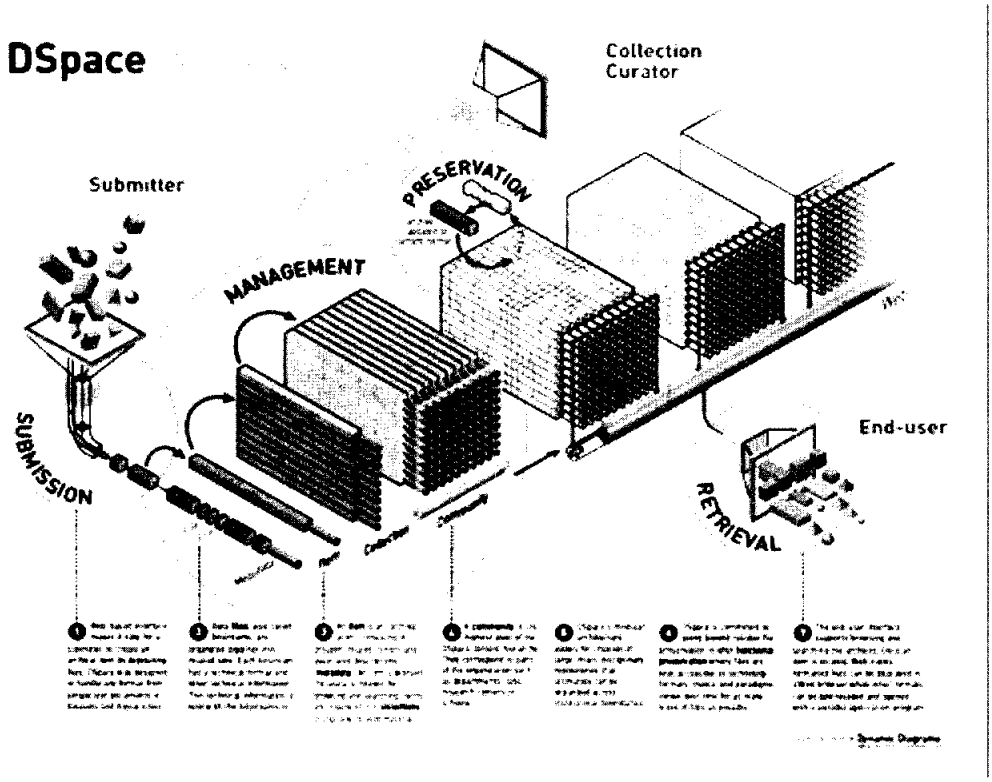


Fig.3 Visualisizing DSpace

4. Top Reasons to Use DSpace

- **Largest community of users and developers worldwide**: DSpace has over 1000 organizations that are currently using the DSpace software in a production or project environment. The most common use is by research libraries as an institutional repository, however there are many organizations using the software to host and manage subject based repositories, dataset repositories or media based repositories.
- **Free open source software**: The DSpace open source platform is available for free to anyone and can be downloaded from the sourceforge open source software repository. The code is currently licensed under the BSD open source license. This means that any organization can use, modify, and even integrate the code into their commercial application without paying any licensing fees. Today there are more than 100 contributors around the world contributing code, bug fixes, etc. DSpace software is managed by a smaller group of volunteer developers (called committers) that work together to plan releases and integrate new features and bug fixes submitted by the community.
- **Completely customizable to fit your needs**: Some of the key ways you can customize the DSpace application to suit your needs areas follows: Ability to customize or theme the user interface - You can fully customize the look and feel of your DSpace website so it will integrate seamlessly with your own institution's website and can be more intuitive for your users. DSpace provides two main user interface options:

5. Characteristics of DSpace

- **Object model: Used by educational, government, private and commercial institutions**: The DSpace platform is used by higher education institutions for whom the platform was initially developed, while also showing a much broader appeal. The software has been used by museums state archives, museums, state and National Libraries, journal repositories, consortiums, and commercial companies to manage their digital assets.
- **Can be installed out of the box**: DSpace comes with an easily configurable web based interface, which any system administrator can install on a single Linux, Mac OSX or Windows box to get started It can manage and preserve all types of digital content. The DSpace application can recognize and manage a large number of file format and mime types. Some of the most common formats currently managed within the DSpace environment are PDF, Word, JPEG, MPEG, TIFF files. It's worth noting that, although out-of-the-box DSpace only auto-recognizes common file formats, files of any format can be managed by DSpace. Traditional (JSP-based) interface and Manakin (XML-based) which provides various "themes" out of the box.
- **Standards compatible.** DSpace complies with many standard protocols for access, ingest, and export. The standards DSpace supports include: OAI-PMH, OAI-ORE, SWORD, WebDAV, OpenSearch, OpenURL, RSS, ATOM
- **Ability to configure Browse and Search** - You can decide what fields you would like to display for browsing, such as author, title, date etc. on your DSpace website. You can also select any metadata fields you would like included in the search interface. All of the text within a given item and metadata associated with the item, are indexed for full text search if desired.
- **Ability to use local Authentication mechanisms** - DSpace comes with plugins for most university authentication methods, including: LDAP (and hierarchical LDAP), Shibboleth, X.509, IP-based. In addition, DSpace comes with its own internal authentication method, or can be configured to use multiple authentication methods at once. You can also build your own authentication plugin if you use a custom authentication mechanism.
- **Configurable database** -You can choose either PostgreSQL or Oracle for the database where DSpace manages its metadata.
- **Ability to choose the default language** -The DSpace web application is available in over twenty languages. So if English is not your local language, you can customize the language which DSpace uses. You can also configure DSpace to support multiple languages, so that the language your user sees is the 'preferred language' set in their web browser.

6. Benefits of Digital Archives: Some basic benefits of digital archives, which are as follows:

- Ability to provide a large number of users' at single time access to unique or special collections, this is the most attractive feature of digital archives.
- Easily accessibility to information and content can be delivered directly to end-usersand retrieve remotely.
- Flexibility of the digital material, since the data is not "fixed", as with paper or printed text, it is easy to reformat, edits and prints.
- Providing access to primary material can help to "publicize" the material to other departments and peers, and to demonstrate the importance of the collections.
- Digital archives are very useful to save the place.
- It saves a lot of time of the users in searching of information

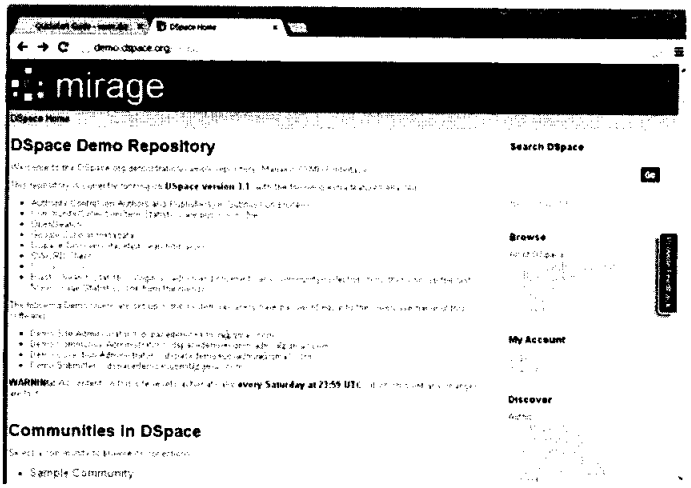


Fig.5 Demo.dspace.org.xmlu/

7. Supporting Organization

The DSpace Project and DSpace community are under the stewardship of DuraSpace, a not-for-profit organization. In July 2009, the DSpace Foundation ceased operation. DuraSpace took over supporting the DSpace project. DuraSpace will sustain and grow its flagship repository platforms - DSpace and Fedora. DuraSpace will also expand its portfolio by offering new technologies and services that respond to the dynamic environment of the Web and to new requirements from existing and future users. DuraSpace will focus on supporting existing communities and will also engage a larger and more diverse group of stakeholders in support of its not-for-profit mission.

8. Conclusion

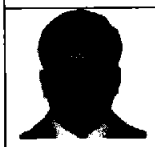
Presently, the world is loaded with different sort of information.To keep all information manually and retrieve it manually is not an easily easy task. Moreover, to keep track with the abundance of information by an individual is also impracticable task. Here the digitisation of the information is brings light on to keep alive all information and make use of it whenever it require with less effort and less time consumption. Apparently, it is true to state that- **"Knowledge is Power. Information is liberating. Education is the premise of progress, in every society, in every family"** (Kofi Annan)

So, **"digitisation is a window of the world"** and this window we can build in the library to enhance the knowledge, through it, to uphold the wisdom of individuals and contribute progress to our Great Nation.

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E-learning as a Prospective Way to Higher Education from Ignou: A Study

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Abstract

The arrival of innovative information & communication technology has been herded as a revolution for the world. The social changes and technologies have also influenced education to change their roles accordingly ICT has been one of the major factor causing change in the field of education.Which people or user can communicate retrieve and disseminate and used information. Today the advancement of the technology has an influenced each and every field including the libraries attached to higher education institution in the form of E-Learning that refers to course that fully online.This paper discusses the meaning characteristic and technological tools used for learning and find out how to play role IGNOU in higher education through E-Learning

ICT, IT, IGNOU, Higher Education

Introduction

E-Learning is concerned with online delivery of information communication, education & training. E-learning has a new dimension to distance education in the world. E-Learning is currently related with amalgamation of IT and learning aspects. Various academic and learning organizations are offering online training courses, virtual classes for their students and employees to co-ordinate training sessions for geographically dispersed clienteles. The higher education in India has come to a threshold where online learning and e-learning are inevitable. When we concentrate on the distance education, a challenging role is before the institutions like IGNOU. Due to changing environments, the enrollments in distance education are also increasing. The country has witnessed dramatic changes in the educational sector due to arrival and implementation of computer and communication technologies.

After the initial introductory phases, in the last decade, the eLearning Industry grew ten-fold globally in India. The literature reflects that this term was coined the role in the late 90's to describe the use of technology to deliver learning and training program me, online learning, web based learning, real time sharing and shared learning in the technology driven instruction and program me. It is also seen that e-learning methods and resources are playing major roles in education and knowledge process. E-Learning is becoming an influential force in higher education today. Different terminologies have been used for E-Learning, it is a fact that makes it difficult to develop a generic definition:-

"It is process of education using computer, telecommunication, networks and storage technology".

"E-Learning means the delivery of learning program me by electronic media".

E-Learning refers to learning facilitated and supported by the application of IT. The term E-Learning used in a variety of ways:-

- Online learning
- Computer based training (CBT)
- Web Based Training (WBT)
- Online resources based Learning (DRBL)
- Network collaborative Learning (NCL)

Tools for E-Learning:-

As said earlier, e-learning is composed of various aspects and activities in the context of information technologies. These are as following:

- Multimedia
- CD-ROM
- Website
- Blogs
- VRML
- HTTP
- CGI
- VSAT
- ISDN
- LAN,MAN,WAN
- Wikis
- Text Room
- Educational Animation
- Simulations
- HTML
- Blogging
- Bulletin Boards
- Course management system
- E-mail
- Instant Messaging
- Internet telephony
- News group
- Online discussion
- Web forms

Application of E-Learning:

The e-learning has a number of roles to play in the field of learning. E-Learning programmes are very useful in:

1. Continuing LIS Professional education and staff development
2. Lifelong learning
3. Learning latest tools and technologies in information retrieval
4. Staff training.
5. Video conferencing.

IGNOU: At A Galance

The Indira Gandhi National Open University was, established by an Act of Parliament in 1985. At the initial level, it began by offering two academic programmes in 1987 i.e. Diploma in Management and Diploma in Distance Education with strength of 4528 students. Today, it serves the educational aspirations of nearly 1.8 million students in India and many other countries. The university is offering more than 126 programmes consisting of 14 Doctoral , 20 Master's degree, 15Bachlers degree and 21 P.G Diplomas,20 Diploma Programmes,36 Certificate and Awareness level programs. A record number of 6.4 lakh students enroll with IGNOU in 2009–2010, which was 4528 in1987. The Cumulative enrolment of student at IGNOU is over 1.48 million as on in Jan 2007.The student System network of IGNOU consists of 62 Regional centers.7subresional centers and 1409 study centers.

Efforts by IGNOU:

i. In 1991, IGNOU started Telecasting educational programme on Doordarshan in 1999;

ii. it started to virtual campus initiative with to programmes the bachelor of information technology (BIT), and advance diploma in Information Technology (ADIT) in collaboration with devel U.K and India.

iii. **In** February 2010 IGNOU added six new Gyan Vani FM Radio Stations in addition to the 31 Radio Stations the University already operates. With over 30 Lakh students, IGNOU has launched National open and distance Learners Library and information network (NODLINET).

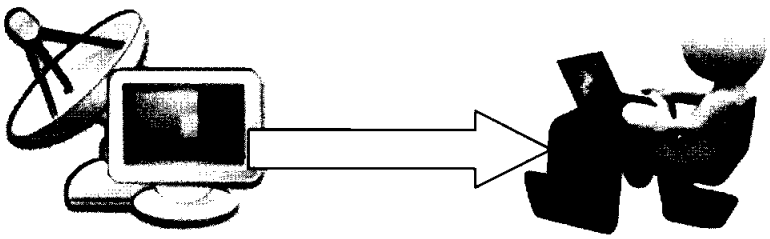
iv. The network has been started with E-book, audio books, video lecturer in the area of science, computer science, humanities and management. IGNOU-UNESCO Science Olympiad Awards 2011' is organized at the university campus. IGNOU achieves the status of world's largest university by UNESCO.IGNOU decides to provide education to all the prisoners in the country free of cost.

The various e-learning programs are discussed as below:

Gyandeep: Project Gyandeep, a visionary and revolutionary idea, has created an impact in the educational area at both national and international levels. Registration under Gyandeep has already touched 3.5 lakh and is likely to increase manifold in the times to come. Gyandeep was dedicated to the nation by the President of India Smt. Pratibha Devisingh Patil on November 19, 2009. Since then, the association between the Indian Army and IGNOU has progressed in all spheres.

With this new dimension, Gyandeep has touched new heights. The Centre of Excellence with IGNOU for the Indian Army will encourage inter-disciplinary higher education and research facilities for Army personnel. With this enhanced dimensions of Project Gyandeep and the new initiative in the field of higher studies and research with other universities/institutions, the Centre of Excellence will function as a national-level coordinating body.

Education Broadcast: A Webcasting facility provides real time access to the educational channels of IGNOU."Gyandarshan I, Gyandarshan II" (EDUSAT) and Gyanvaani are also provided to the IGNOU's Exclusive Channel on YouTube hosting the recorded video programs. It provides webcasting facility linking you to educational channels:-



Framework for receive information through channels

E-Gyankoh: It is an E-Learning telecasting educational programme lunched by IGNOU in 1991. It is an interconnection between student and teacher .It has been launched order to initiate the virtual campus offering programme. A national digital repository initiative to store, index, preserve, distribute and share the digital library resources has been developed by the open and distance learning intuitions .The facility to link the courses lecturer to an online video program on U tube, blog on E-gyankosh has been provided for better understanding of the subject. Ministry of Information and Broadcasting, Govt. of India also broadcast daily IGNOU education program me on Eklavya channel of Doordarshan. Through E-Gyankosh many student can read, store, retrieve, gain new knowledge.

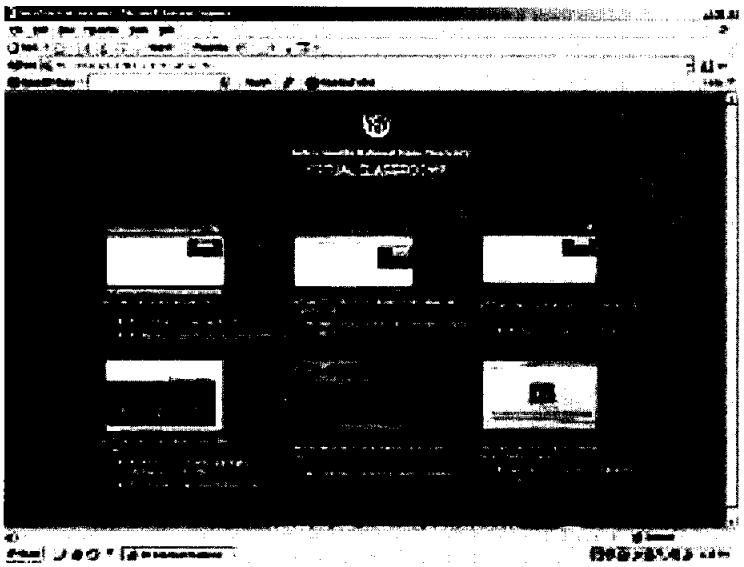
E-Gyankosh Wiki: E-GyanKoshWiki is a collaborative platform for curriculum based e-Content generator and dissemination. Teachers, Students, Researchers, NGO's and all those involved in education field are welcome to publish and share learning resources to support development of rich repository of open educational resource for e-learning.

Gyandarshan: Gyandarshan education channel was started in 2000 to telecast educational programme round the clock in joint collaboration of govt.of India, Prasar Bharti and IGNOU. From this type of E-Learning many people are affected, because many people are listen radio, F.M etc. So this type of E-Learning knowledge disseminate speedy.

Bharat Shiksha Kosh: In order to facilitate donations including smaller amounts from India and abroad for implementing projects/programmers connected with the education sector, the Government has constituted the "Bharat Shiksha Kosh" as a Society registered under the Society Registration Act, 1860. The Bharat shikha Kosh was officially launched on 09.01.2003 during the celebration of Pravasi Bharatiya Diwas.The Kosh will receive donations/contributions/endowments, from individuals and corporate, Central and State Governments, non-resident Indians and people of Indian origin for various activities across all sectors of education.

Vedyadhara: Vedyadhara is a powerful open e-learning framework supported by disciplined social networking. This framework enables IGNOU to reach the study centers, regional centers, academic counselors and students registered in IGNOU's programs to be reached through Internet, mobile, TV and Community Radio, and the many portable/mobile devices that different persons may use. Students learning experience and engagements are enriched through community wiki, discussion forums, LMS and other forms Internet supported interactions. The system of open e-learning is reinforced by powerful query management and messaging services at the disposal of the programs and course coordinators as well as IGNOU's student support services.

Virtual Classes



Methods of E-Learning:

1-A Synchronous E-Learning

a -Internet (online)
b -Intranet (online)
c - CD or DVD (offline)
d - Online connected to network and offline and not connected to network.

2-**Dissusion groups.**

3-**Synchromous E-Learning**

a-Virtual classroom chat
b- Instant messaging

4-Shared white board
5- Audio Video conferencing
6-Appliation sharing

Characteristics of E-Learning:-

- Any time learning facility
- Freedom of learning /anywhere learning
- Remote learner teacher
- Learner centered
- Lifelong learning
- Multimedia nature
- Learning by doing or individual privacy in learning

Advantage: The biggest advantage of e-learning lies in its ability to cover distances. For an organization that is spread across multiple locations, traditional training becomes a constraint.

- Any time
- Any place
- A synchronous interaction
- Group collaboration
- New educational approaches
- Integration of computer

Disadvantage:

1. Learner is needed access to PC and internet
2. Lack of technical trained staff
3. Lack of free to face conversation
4. Training and full knowledge about software and hard ware are required
5. Time taken to learn how to use the E-books
6. Cost wise it is expensive as every is supposed to have computer, internet web camera and printer
7. Learners needed various types of DI and component, maintenance also very costly

E-Learning Media and Resources:

- E-Mail
- E-Journals
- G-Mail
- SMS/MMS
- E-Learning
- E-shops
- E-dictionaries
- Search engines

- Meta search engine
- Websites

Present Scenario:

Arul (2014) discusses about the Industry participation in higher educational institution develops employability skill among management students:

1. Curriculam designing
2. Case designing and development
3. Mini projects and assisgnments
4. On the job and internship training
5. Performance testing and evaluatgion
6. Reciprocal sharing arrangements
7. Setting up a business development cell on partnership.
8. Faculty exchange and participation in industry and vice-versa in university and specialized institutes and
9. Promoting entrepreneurship in education system.

In the current scenario the advantage of Multicultural Classroom cannot be ignored in which the e-learning helps at great level. Multicultural classroom helps the students in various ways to enrich their potentials and values in the sense that multicultural classroom helps to (Rathi, Sabeena and Muthaiah, 2014):

1. Respect other culture and develop positive attitude towards the cultural diversity.
2. Develop communication skill among children.
3. Avoid cultural taboos.
4. Create a platform for social change.
5. Encourage positive acculturation.
6. Develop wider perception on education and society.
7. Develop social justice and democrative values among students.
8. Construct knowledge logically and critically on the ethno – science and technology.

They (Rathi, Sabeena and Muthaiah, 2014) share five different approaches for multicultural education mainly:

1. The teaching and culturally different approach attempts to raise the academic achievement of students of culturally and linguistically diversified through culturally relevant institution.
2. In the human relations approach students are taught about commonalties of all people through understanding their differences in Institutional and economic power.
3. The single group studies approach in about the histories and contemporary issues of oppression of people of colour, women, low socio-economic groups, and gays and lesbians.
4. The multicultural education approach promotes the transformation of the educational process to reflect the ideals of democracy in a pluralistic society. Students are taught content using instructional methods that value cultural knowledge and differences.
5. Educators who use the social deconstructionist approach to multicultural education to a step further to teach students about oppression and discrimination. Students learn about their roles as social change agents so that they may participate in the general of a equitable society.

These categories overlap, and educators may use more than one approach simultaneously. Reddy (2013) discusses about some pioneering schemes emerging in which sophisticated interactive broadcasting techniques are a fundamental developmental platform for radio broadcasting. For example, the radio with

pictures show is integrating web conferencing with radio broadcasting to create a rich and interactive audience experience with great potential for educational applications and addressing digital divide issues.

In the fast pacing IT environment, education has largely contributed to an increase in developing knowledge, providing an enabling environment for innovation and in building human capital required for a potential future knowledge economy. Also he states that the global reforms in education and challenging ICT demands have made a remarkable shift in the structure of the enabling ICT environment and the utilization of ICT Technologies in education. The Dakar Framework of Action for Education for All (EFA) , adopted in 2000 as a roadmap to meet the education for all goals by 2015, highlights the role that ICT has to support EFA goals at an affordable cost and lifelong learning in all communities in developing countries. It is pertinent that all e-learning strategies be grounded in strong research. Just the way a teacher would adopt a different style of teaching in a classroom setting for different groups of students, e-learning too essentially requires a good strategy that sets the platform for optimum learning (Reddy, 2013).

Conclusion:

The Indian education also has relished to give web based service to users. We say always the environment have change, and may technology change ,technique may change, finally the results of the changes .A new revolutionary fact has been enveloped and get new information through E-Learning. So India have become open many new university, institution, learning centers which are promote higher education through E-Learning because in present time a large number of population in India stayed in villages and rural areas ,where education is not provided and only 40% people knows that how to use computer, we want to open various learning centers in various areas .In present time approximately 17% people get higher education through e-learning medium. There are more than 14 national and state universities educations institutions of conventional universities distance education accounts for 24% of the total enrolment in higher education in India.

So we can say that E-Learning is a new scenario to provide online delivered information communication, education, & training and resent phenomenon an currently restricted to IT sector, by e-learning 5th laws of Library science "books are for use" is change new dimensional form "knowledge for all "all for knowledge.

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Electronic Resources in Libraries: *Overview*

Ananthnag, K



The growing demand for the electronic resources from the users gives the birth to e-resources. This paper discusses the concept of e-resources advantages, awareness and impact in the present library system, characters, selection process, minimum hardware & software requirements. Electronic information sources can be seen as the most recent development in the information technology and are among the most powerful tool ever inverted in human history. Electronic information sources are becoming more and more and important, for the academic community. The electronic resources are forms of information which are being added to tune with needs of the users of libraries these are many consortium efforts by many agencies in providing such electronic resources to the libraries. The packages of these electronic resources and issue and problems are discussed here.



E-resources, E-journals, E-books, E-database E-courseware, Information technology, Hardware/software, Libraries.

1. Introduction

Electronic resources are changing the way libraries deal with patrons' and with content resources. Most libraries use the internet in many of the expected ways, to provide access to online catalogs, databases. Most electronic resources are available from off campus as well so you can get hold of them from wherever you have access to the web. This tutorial will: explain the advantages of using electronic resources explain how you can access electronic resources from off-campus, introduce you to e-books, e-journals, databases, search engines and subject gateways. Electronic publishing of material is having a huge impact upon libraries and librarianship and it solve many problems of users related their information search. Resources sharing arrangement with other libraries via e-mail, internet, intranet and such other is yet another advantage of the information technology revolution.

The library plays a leading role in faculty-library relationships and in instructional services such as orientation and training in use of library resources. If efficient and effective use to be made of library's resources, then user training will have to increase in both strength and coverage. It is important to remember that the ability of library staff to keep up to date is necessary and therefore training for them is important as well.

2. Characteristics of electronic resources

Electronic resources play an essential role in the filed of library to provide better services and easy access to library centers. The some points are mentioned below.

- Storage
- Content
- Functionality
- Multi-access at a time
- Speed
- E-resources can be preserved easily
- Less physical space
- E-resources can be used any time/always
- E-resources easy to skip from one page to another
- Information can be get back easily

3. **Selection of Electronic Resources:** Librarians and faculty cooperate to develop the library collections. The selection process is coordinated by collection services. Recommendations for the purchase of materials (e-resources) are accepted from faculty as well as staff, via librarians but final responsibility for the selection of library resources lies with library recommendations for major purchases of electronic resource and for all serial subscriptions must be submitted for consideration to the e-resources and serial review committee.

4. **ICT requirement for Accessing Electronic Resources:** A minimum level of hardware and software infrastructure is a pre-requisite or requirement for a user or subscribing institution desirous of subscribing e-resources so as to achieve efficient and effective interaction with subscribed resources. Basic hardware and software requirement for most electronic resources are as follows:

5. **Minimum Hardware Requirement:** Since most e-resources subscribed by the consortium are web based, subscribing institution should have a full feature and configured system with high speed internet connectivity to get better access to e-resources.

Most publishers prefer to make their e-resources accessible on campus network of subscribing institutions on dedicated IP addresses/range of IP address. Subscribing institutions should have campus network spread over their entire campus so as to maximize the usage of electronic resources. Moreover, institutions subscribing to e-resources should have adequate number of PCs on the campus local area network (LAN) available to faculty, researchers and students to maximize the usage. In addition should also have a number of PCs in their library dedicated for this purpose.

The minimum configuration of PCs available on the campus network should be as follows:

- Window OS
- Windows PC with P-4 CPU
- Monitor 15" or 17"
- 512 MB DDR 400 MHz RAM
- CD-ROM Drive
- HDD 40 GB
- **Internet Connectivity:** Institutions should have 528 kbps (preferably 2 mbps or more) connectivity to internet for improved access (electronic resources) depending upon the total population of users.
- **Minimum Software Requirement:** Most electronic resources offered through the consortium requires an internet enabled multimedia PC equipped with an internet browser like internet explorer or Netscape navigator as their clients. Most digital collections are accessible without any problem with the web browsers mentioned below.
  - Firefox Mozilla 1.0 or later
  - Netscape 4.79 or later
  - Opera (Java version required) 6.0 or later
  - IE 5 x or later

6. **Websites (World Wide Web):** The following websites, free open access (resources) to the users.
   - http://www.freefulltext.com
   - http://www.doaj.org
   - http://www.freemedicaljournals.com
   - http://intl.highwire.org
   - http://ijser.org
   - http://www.insa.ac.in
   - http://www.ias.in/pubs/journals

- http://www.indianjournals.com
- http://www.krepublilshers.com
- http://www.indmed.ni.in www.openmed.nic.in
- http://www.medknow.com/journals.asp

7. **Search Engines:** Search engines are defined as a set of program that includes spider (crawler, boot or robots) crawls the interne receiving web documents then follows links to retrieve other web documents. Some of the frequently used search engines and directories are.
   - Google http://www.google.co.in
   - Alta Vista http://www.altavista.digital.com
   - Yahoo http://www.yahoo.com
   - Wikipedia http://www.wikipedia.com
   - IndMed http://www.indmed.nic.in
   - Medmark http://www.medmark.org

8. **Subscription Mode to E-resources:** Publisher packages which may or may not be part of a consortium and are required by purchase through a subscription agent, the consortium or from the publisher directly.

Sl.	Publishers/Gateways	Websites
01	Science Direct	www.sciencedirect.com
02	MD Consult	www.mdconsult.com
03	OVID	www.ovidsp.tx.ovid.com
04	Oxford	www.oxfordjournals.org
05	Jaypee Brothers	www.jaypeedigital.com
06	BMJ	www.bmj.com
07	John & Wiley	www.wiley.com
08	Annual Reviews	www.annualreviews.org
09	Springer-Verlog	www.springerpub.com
10	Lippincotts	www.lww.com
11	Blackwell	www.ulib.niu.edu
12	W.B.Saunders	www.jocketflap.com
13	Bentham	www.benthamscience.com
14	Ebrary	www.ebrary.com
15	Taylor & Francis	www.taylorandfrancis.com

9. **Kinds of Electronic Resources:**
   - Electronic journals
   - Electronic books
   - Electronic reports
   - Electronic newspaper
   - Electronic thesis/dissertations
   - Electronic databases
   - Electronic documents
   - Electronic courseware
   - Electronic standards

- Electronic patents
- Abstracting & indexing databases
- CD-ROMs

- **Electronic Journals:** Electronic journals are defined as any journals, magazine, ezine, newsletter or type of electronic serial publication which is available over internet.
- **Electronic Books:** E-book an electronic version of a printed book which can be read on a computer specially designed handheld device designed specially for this purpose. A dedicated device for reading electronic version of printed books (Oxford Dictionaries). An e-book can be offered indefinitely without ever going out of print. E-books include reference books, Monographs and textbooks.
- **Electronic Reports:** E-reports are considered as significant resources by the scientist and research scholars, as these include reports in electronic form. Types of reports are:-
  - Proposal type Reports
  - Contact Progress Reports
  - Topical Reports
  - Contract Reports
  - Books as Reports
  - Committee Reports
- **Electronic Newspapers:** E-newspaper is a self contained, reusable and refreshable version of traditional newspapers that acquire and holds information electronically.
- **Electronic Thesis/Dissertations:** An e-thesis and dissertations is an electronic document that explains the scholar work of researcher. Electronic thesis and dissertation providing a technologically advanced medium for express ideas with less expensive and easy handling with high durability.
- **Electronic Databases:** E-database is an organized collection of information of a particular subject or multidisciplinary subject areas, the information of a database can be searched and retrieved electronically. It contents journal articles, newspaper articles, book reviews and conference proceedings etc.

  A full-text database contains the whole content of an article such as citation/reference information, text, illustrations diagram and tables. Bibliographic databases only contain citation information of an article such as author name, journal title, publication date and page number.
- **Electronic Courseware:** E-courseware is an educational material intended as kits for teachers or trainer or as tutorials for students usually packaged for use with computer.
- **Electronic Standards:** American Standard Association as "a consider statement of the requirement for a material, process, method, procedure or service, including, wherever possible the exact procedure by which it can be determined that the conditions are met within the tolerances specified in the statement; a specification does not have to cover specifically recurring subjects or objects of wide use or even existing objects"
  - International Standard Organization www.iso.org/iso
  - British Standards Organization www.bsigroup.com
  - Canadian Standards Associations www.csa.ca/cm/ca/en/home
  - American National Standards Institute www.ansi.org
- **Electronic Patents:** According to Encyclopedia of library sciences "A patent, generally speaking is a grant from the government which confers on the grantee for a limited period of time the exclusive

privilege of making, selling and using the invention covered by the patent and also authorizing other to do so". Some of the important patents organizations accessed thorough online are mentioned below.

- US Patent and Trademark Office http://www.patft.uspto.gov
- Google Patents Search www.google.so.in/patents
- Free Patents Online www.freepatentsonlline.com
- World Intellectual Property Organization www.wipo.int/portal

- **Abstracting & Indexing Databases:** The collection acquisition of abstracting and indexing database depends on the demand of user. Also a library has to choose require data from a large number of databases available in the market. Example: Diaglog, Cambridge Scientific Abstract, OCLC, Ovid.
- **CD-ROMS:** Compact disc – read only memories is one of the series of devices. It stores large amount of structures data, bibliographic information full text information and images etc. Larger amount of data can be stored permanently. CD-ROMs are chief electronic resources

10. Electronic Documents (Barker):

- **Static Documents (E-resources):** These documents are the most basic type of e-resources. They contains only fixed information and never change in their from. Example- traditional online data
- **Dynamic Document (E-resources):** They contain only fixed information but are able to change their outward from the way embedded material is presented to users. Example-Multi media CD-ROM
- **Livings Documents (E-resources):** They are able to change their form outward appearance and embedded information. Example- Information contain on the web

11. Access to Electronic Resources:

There are two types' access electronic resources like:

- **Direct access resources**: these are resources which can be used at any time/anywhere, Example: Databases available in CD form.
- **Remote access resources**: in this model the publisher hosts e-resources at his website. When the library subscriber to the e-resources, it provides access wither from a set pf designated user terminals or through library LAN or campus LAN. The subscriber gets a user ID and password, which can be used from any use terminal in the library.
- **Procure Electronic Resources:** There are two kinds of buying electronic resources are.
  - Paid electronic resources
  - Free electronic resources

12. Advantages of Electronic Resources:

- Usually, more than one person can use the same e-resource at the same time
- Save the users time
- Available 24x7- any time information available
- Provide quick information's
- Solve the problems of missing issues of journals/books
- They can be accessed from any computer on campus and usually ay computer off -campus and any time of the day or night, so there is no need to make a trip to the library

- Usually, many users can access the same journals at the same time
- Each journal can be searched very quickly and easily, often through the complete full text of all articles, otherwise via online index.
- Easily searchable
- Students/faculties spend less time in doing literature survey for the topic of research.
- An e-resource can be downloaded in minutes, while sending a paper book takes lot of time or days.

13. Disadvantages of Electronic Resources

- Difficulty reading
- Highly expensive resources
- Beginning high infrastructure
- Adequate infrastructure
- Skilled manpower required
- Need special equipments to access
- Excessive printing of documents
- Copyright management and royalty issues with authors are adding their might to problems of marketing.

14. Library Consortium: A library consortium is an association of a group of libraries to achieve equally the common goal. A consortium could be described as group of organizations who come together to fulfill a combined objective that usefully require co-operation and sharing of resources. The ICT has facilitated the libraries all over the world to establish networks for resource sharing. To initiate training to the users, librarians, research scholars and faculty members of the institutions in use of electronic resources with a vision to optimize their usage.

15. Recommendations

- The recommendations relates to faculty's use of electronic resources for communication, especially e-mail and its use in communication with students.
- The recommendation refers to the response indicating that many of the faculties/students are innovative and enthusiastic to be part of the information revaluation.
- The level of computers access and internet connections at the library/university revealed a need for improvement with regard to connecting to a campus network, internet use is maximized by availability of networks workstations, and the results of a survey such as this should be used to lobby for universal access for faculty.
- The library has a responsibility to support such identify because universal access is essential for the library to maximize the use of the resources it provides.

16. Conclusion

The present study has broadly explored the possibility of accessing electronic resources through internet. Libraries of all size and types of embracing digital collections, although most libraries will continue to offer both print and digital collections for many years to come. An electronic resource is an electronic information resource that one can access on the web, on or off campus. Electronic resources are gradually being added to the collection of the library with more and more demand coming from the user community. It

is being recommended that all libraries can collect all the downloaded contents at one place and mange them for further helpful. There is a need for the library to train its staff and users on using computers for information retrieval purposes.

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E-Resource Subscription:
Current Issues on the Service through INDEST-AICTE Consortium

Prabhat Kumar Choudhary **Ashu Shokeen** **Pravin Kumar Choudhary**

Abstract

The purpose of this paper is to describe some of the important issues, which are needed to address with different publishers before the subscription of e-resources for Library Services renewed. This is in view of no service of e-resources subscription service to self financed institutions from the year 2014 by INDEST-AICTE consortium. Institution included in this study are self financed members of INDEST-AICTE Consortium and publishers are Wiley, Emerald, Taylor & Francis, IEEE, ACM, Springer, Elsevier, Nature publishing group, ASME, McGraw Hill. Different publishers and the exclusive agents of different publishers were contacted with some general questions for presenting before the authority and their views received on subscription were analysed in the interest of Library services.

E-resources, Library service, Acquisition, Consortium.

1. Introduction

Library E-resource subscription Service in Higher Education & Research Institutions in India is being facilitated by many consortia. Indian National Digital Library in Engineering Science and Technology (INDEST) - AICTE Consortium' is for technical institutions and prominent one. Initially it was open ended, meaning that any institution could join it to get the subscription facility.

INDEST Consortium was set up by Ministry of Human Resource Development (MHRD) on the recommendation of Expert Group, chaired by Prof. N. Balakrishnan in December 2002. The ministry provides fund for subscription to e-resources for institutions like IITs, IISc, NITs, and few other centrally funded Government institutions through consortium which is housed at IIT Delhi. In initial year there were 38 core members, 60 AICTE supported members, and 12 self supported members. E-resource subscription service of consortium to self financed institutions was co-operative subscription to electronic resources and was the principal task of Consortium with focus on access to electronic resources to support education & research of its self financed member institutions. It carried out negotiations with publishers and aggregators of electronic resources. It was also performing the functions e.g. invoicing, receipt of payments, ordering and payment to publishers on behalf of self financed member institutions. The major terms of reference that the Consortium took into consideration while negotiating with the publishers were:

- Lowest rates of subscription;
- Access to archival back files along with current subscription;
- Archival backup or perpetual access to e-resources;
- Cap on annual increase in rates of subscription;
- Better terms of license for access to e-resources.

The e-resources available in initial years through consortium to self financed institutions included:

- IEL online
- Springer's Link
- ABI/Inform
- ASTP
- ACM Digital Library
- ASCE Journals

- ASME Journals
- Compendex
- INSPEC
- MathSciNet
- JGATE

In few conditions there was provision for 'Archival Solution' with INDEST. The membership of INDEST-AICTE consortium went to 1373 in last ten years. Out of these members 1245 were self supported institutions. Because of some issue the consortium has stopped subscription service for e-resources to self supported institutions from 2014.

AICTE prescribes minimum resource acquisition for Library to maintained standard at technical institutions in India. AICTE was convinced with good result of e-resource subscription through consortium and supported 60 institutes with identified e-resources at the beginning of INDEST consortium in 2003. These e-resources made available to e-subscription included:

- IEL Online (single user),
- ASCE Journals,
- ASME (Journals) and
- Applied Science & Technology Plus (ASTP).

Subscription to e-resources was considered as equivalent to mandatory requirement of subscription to print international journals in AICTE handbook. In the year 2011 AICTE became the active partner of INDEST consortium and many e-resources were added in the list of consortium's e-resource. From the list many e-resources were made mandatory & some were as optional for different course, running in AICTE approved Institutions. Price and Terms to subscribe were also spelt out in AICTE Approved process Handbook 2012-2013. It worked smoothly for many state government funded institutions till the end of subscription period Jan to Dec 2013.

University Grand Commission (UGC) through its notification no. Ref. UGC Public Notice no.14-9/2013(CPP-II) dated 3/12/2013 is in process to evolve suitable methodology to ensure that the existing technical/engineering colleges affiliated to universities do not dilute standards of technical institutions imparted by them. This process also includes the subscription to e-resources.

2. Contribution of Consortium in e-resource Library Service:

The benefit which consortium **imparts** in e-resource service included:

- **Selection of e-resources** - In market there are variety of e-resources. Neither all of those are relevant nor useful for an institution. Therefore the most important aspect is the selection of useful e-resources for the member institution. INDEST-AICTE consortium selected e-resources for engineering, science and technical institutions by a committee of subject experts at national level. In these subject-areas the institutions like IITs, IISC are the institutions for reference for other institutions in India and they are in the core group of this consortium. In this way selected e-sources were certified and Librarian at Individual institutions found oneself above the doubt, sometime expressed by accounts and administrators over the local Library System.
- **Price of e-resources** – It is very important issue for the feasibility of any service. And due to high price many services are not provided by an individual Library. Most of the e-resources are published by foreign publishers. They define pricing mechanism of a product for their benefits. Pricing mechanism is not explained by them to an individual institution and an institute left with no option than to accept their price if it wanted to give e-resource service. INDEST-AICTE consortium identified prosperous subscribing institutions to e-resources, taking into the account to core members and AICTE funded institutions. With this number the price of different selected e-resources was

negotiated with publishers which came down and suited to the budget of many self supported institutions. Consortium also considered for the pricing of multi years with some price cap for each year. The INDEST-AICTE pricing module was acceptable for mass and the number of self financed institutions grown to 1245 by the end of calendar year 2013. The Librarian of self financed institute felt safe under the umbrella of INDEST-AICTE consortium.

- **Selection of different agencies for e-resource:** Many publishers do not make their e-resources available directly to an individual institution and they do it through the agents. Hence selection of a genuine agency for procurement of e-resources is another important aspect. INDEST-AICTE consortium identified the genuine agencies for different e-resources with the full details of contact persons In this way an individual institute found itself saved with time.
- **Terms and Conditions for e-resource Library Services: modus operandi of e-resources accessibility** is another important issue while subscribing e-resources for library. The important considerations in this regard includes; what will be the contents of package, how the payment will be made, what will be happen to content if e-resource is not renewed after subscription-period is over and what will be legal procedure in case of any arbitration etc. In the form of INDEST-AICTE Consortium an individual institution got an umbrella by getting membership of consortium.
- Members got invoice for selected e-resource and made payment for the same to consortium. In case of any access problem individual institution contact consortium office which is working from IIT Delhi. All consortium institutions treating consortium as an acceptable authority in case of any arbitration. AICTE also laid some of the issues as Terms & Conditions for subscription to e-resources to avoid any subscription related confusion. The terms and conditions included subscription period (as per calendar year), subscription order with 100% advance payment on GOC conversion rate prevailing in the month of order. Campus wide IP authenticated access to any number of simultaneous users for browse and download. AICTE also mentioned that an institution should sign subscription agreement with publisher on fair use policy, subscribed content, price & arbitration in case of dispute.

3. AICTE mandatory subscription of e-journals

AICTE also listed the mandatory subscription of e-journals package for all engineering institutions conducting UG/PG courses in its 'Approval process hand book: 2012-2013'. The list included following packages-

S. No.	E-resource	Subject	E-Content	2011	2014 (Price given to Inst.)
1	IEEE	CE+CS+EEE+ Telecommunication & related disciplines	ASSP (145 e-journals 2011, Back file access since 2000	$4980	$39340
2	ASME	Mechanical Engineering	25 e-journals package (2011, back files since 2000	$2156	$2434
3	ASCE	Civil Engineering	33 e-journals (2011 back files access since 1983)	$2520	$2844
4	McGraw Hill	General Engineering and Reference	Access Engineering Library	$1969	$2170
5	ELSEVIER	Engineering + Computer Science	Science direct 9275 journals back file access from 2000 onward)	$6500	$6961.5
6	ASTM Digital Library	Online dictionary of Engineering Science & Technology	Over 1700 e-books & over 13000 journals and articles	$1100	$1100

Mandatory subscription of e-journals for institutions conducting program in Management were:

S. No.	E-resource	Subject	E-Content	
1	EBSCO	Management	Business Source Elite e-journals collection (1802 e-journals & magazines, 2011)	$3500

4. Recent Development for self financed institution on e-resource Library Service:

With the end of calendar year 2013 the self financed institutions were looking to consortium with an expectation of smooth e-resources library service during the calendar year 2014. Contrary to it, they got an e-mail from consortium where it was mentioned that it will not provide e-resource subscription service to such institutions with effect from 2014 without citing specific reason. However the consortium negotiated the price of different e-resources for core member institutions. But it has provided names of agency through which the consortium has renewed the e-resources for core member institutions. The applicable mandatory e-resources subject collection from AICTE handbook 213-14 for institutions conducting UG/PG courses & corresponding consortium price in 2014 are:

S. No.		E-resource	Subject	2014 Cons. Price & Remark	
1	a	IEEE	CE+CS+EEE+ Telecommunication & related disciplines	$17830	IEL Level III
2	a	Springer	EE & CS Engineering	€7585	1400 journal , for NIT/ISM/ IIIT/NITTTR
			OR		
	a	Wiley-Blackwell	CS+ Data System + Telecommunication and related discipline	NA	
3	a	ASME	Mechanical Engineering	$2434	Self supported and AICTE funded College
			OR		
	a	Springer	Mechanical Engineering	NA	
			OR		
	a	Wiley-Blackwell	Mechanical, EE Engineering	NA	
4	a	ASCE	Civil Engineering	$2844	Self supported and AICTE funded College
			OR		
	a	Wiley-Blackwell	Civil Engineering	NA	
5	a	McGraw Hill	General Engineering and Reference	NA	
6	a	J-GATE	J-GATE Engineering and Technology (JET)	NA	
7	a	ELSEVIER	Engineering + Computer Science	$5501+ $61123	2 subject collections to be paid by INDEST and by New IITs/NITs
8	a	ASTM Digital Library	Online dictionary of Engineering Science and Technology	$10143	ASTM Standard and Digital Library

E-resources subject collection from AICTE handbook 213-14 for institutions conducting programme in management: & corresponding consortium price in 2014 are

S. No.		E-resource	Subject	2014 Cons. Price	
1	a	J-Gate	Management science	NA	
2	a	Gale Cengage Learning	Business and company resource centre + Gale business insight global	NA	
	b	RMIT	Informit business collection	NA	
			OR		
	b	Emerald	Emerald Management first database	£2055 for 150 journal for IIT/ISC/IIM	7 (IITs/ IISc) and 6 (IIMs). Subscriber must maintain their Print
3	a	EBSCO	Management	NA	
4	a	ProQuest	Management	NA	
Note-	S. No. 1 is compulsory From 2/3/4 institutions can opt for any one along with S. No. 1				

6. Bird view on ICT infrastructure of self financed member of consortium

Self financed institutions are affiliated with any university. ICT infrastructure of university libraries in India is not very good. Many central Universities and the Institutes of National Importance have been established by the Government in 11th five year plan and they are developing their ICT infrastructure. Thus only few central universities, Institutes of National Importance and Deemed Universities are have sound ICT infrastructure and are providing user service like World Wide Web service, File Transfer Protocol service, Bulletin Board Service and E-mail service.

The process is slow and in peace-meal due to many difficulties at most of the other university libraries. The challenges of these institutions can be grouped into four categories:

- Lack of resources i.e. funds, electric power supply, non availability of heavy-duty UPS and generators, non-availability of LAN etc.
- Lack of Human resources - It includes computer and software skilled manpower, absence of university librarian, lack of training facility, non availability of consultancy services etc.
- Hardware/Software related problems (Procedural problems) - It includes problem related to technology and library operations, cumbersome purchase procedure for the acquisition of hardware and software, lack of maintenance, post installation support, inadequate hardware, lack of well accepted standard software etc.
- Timeliness problem- It includes late implementation of library automation activities, non awareness among the authorities, low priority of libraries, delay in retro conversion, lack of proper guidelines and planning for automation of library activities etc.

7. Current Development and its Implication

- Content wise IEL level III is more than that IEEE ASSP (145 e-journals). **The limitation by simultaneous number of users for this package has been removed.** It also includes conference proceeding, standards etc. Accordingly price is more as has been approved by consortium for 2014. This price is not within reach to many self financed institutions whereas the price fixed for ASSP was

well in reach for most of the self financed institutions and was supporting the proverb 'Something is better than nothing'.

- Prices in 2014 of ASME and ASCE, McGraw Hill, Elsevier e-resources for the contents identified have increased uniformly from the base calendar year 2011. Price in 2014 of ASTM Digital Library is same to that in 2011.
- Many e-resources have been added in the AICTE hand book: 2013-14 for engineering institutions conducting UG/PG courses and conducting program in management. This handbook is applicable in calendar year 2014 as per AICTE web page. These publishers are Springer, Wiley, Emerald, J-Gate, Gale Cengage Learning, J-Gate, ProQquest, EBSCO & RMIT.
- Springer has given a price for its e-resource (1400 journals package) to a self financed institute is about double to that given to consortium members (NIT/ISM/NITTTR/ IIIT).
- Emerald 2014 price for its e-resource (95 journals) to a self financed institute is more to that to consortium for (150 journals). However for consortium price 2014 for this e-resource it is mentioned that 7 (IITs/IISc) and 6 (IIMs) must maintain their Print.
- Wiley is making a clause that its package & price given to AICTE is for private AICTE approved institutions and not for Government institutions.
- One of the publishers namely ELSEVIER did not provided access to its e-resource in the beginning of the calendar year 2014 if a self financed institute did not renewed e-resource by 31st December 2013.

8. Findings

Many issues on the subscription to e-resources such as mode of procurement of e-resources for example access mode/subscription mode, price for e-resources, applicable conversion rate, requirement of intermediate agency and other important points on License agreement, are required to be placed on record in the interest of e-resource services. Indian e-resources should be accepted at par with the foreign e-resources in own country.

9. Suggestions

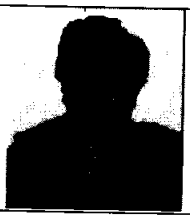
- Most of the university libraries having scare resources for developing its ICT infrastructure to provide E-resource library services. It is suggested that required basic infrastructure should be put in place before subscribing e-resources.
- A license agreement must have a clause which should give right to access the content of subscribed journal(s) for the subscription year, even if its subscription is dropped in future years by the scribing institution.
- The financial approval in our country is given for the period April to March, but subscription period for most of the foreign resources is governed by calendar year, which starts in Jan and ends in December.
- Hence publishers discontinue access to e-resources after the end of calendar year in the month of December.
- Hence there should be provision of grace period of three months during which e-resource subscription to library is not disturbed by the publisher.
- There should be a price cape for all publishers with due consideration of conversion rate and the resources accessed during previous year. The e-resources by many a publishers enlisted in 'Approval process hand book: 2013 -2014' have either added its own clause of pricing or have increased the price without due consideration of its price to a self financed institute during previous years.

- Consortium has refused to provide e-resources subscription services to self financed institutions with effect from 2014. Since these institutions are spread over all states and under different controls, hence all of them can not come on another single consortium.
- Hence INDEST consortium should provide at least standardisation of e-resource library services in terms of the standard terms & conditions, the usages based pricing and the concerned agency or publisher's contact address to self financed institutes.
- INDEST Consortium should not work in project mode rather it should work as a unit of IIT Delhi Library and funded by Higher Education, Govt. of India.
- Indian scientists are contributing to foreign publisher free of cost or some time with payment and on being published it is purchased by Indian institutions after making a payment to the publishers. Here the affiliating institute of an author bears the cost of research by that author.
- In this knowledge cycle the input of a country in knowledge creation should be measured and price of the e-resources should be negotiated accordingly with the publishers.
- Affiliation of an author has a great value in measuring research output of an institution, a state/UT where it is located and the country. Also many publishers involved in bibliographic databases have their ways to record the affiliation of an author.
- Hence the apex body should notify a pattern for author affiliation while communicating his research for publication.
- In said AICTE listed e-resource there is hardly any primary e-resource published from India. Hence consortium should also take initiatives for publication of journals in different areas of Engineering, Science and Technology; so that it will be able to give a good platform to publish good researches and the monopolies of foreign publishers will reduce.

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E-Resources and Changing Role of Academic Librarians

Rajkumar Ghule



This paper highlights the electronic resources needs, of the users in modern age. In this modern age technology plays vital role for generate and disseminate of information. Now a day students changing the demands and expecting latest information from academic libraries, so the librarians must change his nature in modern environment with changing age. The paper attempts to describe the concept, purpose, advantages and limitation of E-resources. In present day, prices of printed format journal are increasing. In such situations e-resources plays vital role in information age and the role of academic librarian is very important in this area.



E-Resources, Advantages, Skills, Knowledge, E-Library.

1. Introduction

The library environment has changed due to constant development of ICT (Information Communication Technology) all over. Libraries are making the increasing use of internet resources to provide the services to their users. The academic library has been from its inception an integral part of institutions of higher learning, rather than an appendix or adjunct. The academic library, like any other formal establishment, is designed and run people whose job is to combine and use organizational resources to achieve organizational objectives. Quality and training will be major activity using machine readable resources in the future. When the users often visit library to find resources about their projects or class assignments that have to be submitted within stipulated time. It is the librarians who have to make the required information available to the users without wasting his/her time. This is possible only when the librarians acquires, store, locates and disseminates the information. It might include database searching and sending the relevant information based on user query to the user's desktop through email or through the internet in shared folder.

2. E-Resources

Any electronic product that delivers collections of data, it may be text referring to full text databases, electronic journals, image, collection and other multimedia collections. These may be delivered on CD-ROM on tape via the Internet, www and on a high-speed multimedia personal computer that has more power than the early main frame computers. The University of Glasgow the term E-Resources as any resources that are available over the internet can.

3. Requirment of E-Resources

Authors are interested in self-publishing, new models for scholar, quality assurance. Publishers are interested in publishing changing readership, user expectations. Libraries have the challenges to provide new content and new consortia have become very influential through cooperative purchasing and negotiation of licenses, they are concerned with assured access and rights management and archiving. These are the reasons to acquire the web resources in libraries.

4. E-Resources and Libraries

Today libraries face challenges while responding to the changes. They sustain their traditional role. With the explosion of information technology the powerful competitive forces that raise fundamental question about the role of libraries. The libraries should be engaged in the creation and dissemination of knowledge. These also tools and services provide instant access. It searches information and transfer information to any corner of the world. An educational institute and libraries user requires the latest and

pinpointed information in their respective fields. Due to the increasing cost of information resources, developing countries cannot provide these resources to their users. But the E-Resources with its advantages make available the way for the developing countries to access information at a very low cost. Libraries should provide e-resources to both teachers and student with the expectations that the E-Resources will be used for educational purposes.

The services of libraries are moving into the network based environment and website have become an important services exist in many forms such as E-mails, web forms, E-books, CDs, videos, journals, journals articles, data bases, films, audio digital products, online publishing, public domain and commercial online database are available through Internet, other propriety databases and through various private network services providers. The advent of new technologies in telecommunication and broadcasting are making it possible to fulfill varied needs of users. Librarian should promote the use of IT as an integral part of library services.

5. Advantages of Resources

- Instant Access
- Easy updates / Revisions
- Less Bulky
- Cheaper
- Customizable
- User friendly
- No need to purchase multiple copies
- No warehousing / Transportation / Distribution
- Avoid binding,. Shelving, and ease of preservation/ ardhiving

6. Limitation

- Technological demands
- Hardware and Software
- Networks
- User attitudes
- Archival access

7. Role of Librarians in E-Resources

The ready availability of information on the internet, and its widespread use, really presents Librarians with an opportunity, not a threat. Technology savvy users realize they need help, which librarians can provide. Librarians now face difficulties and complicity challenges due to new trends in information access. In the present in internet/ technological era the professionals have to change themselves as the information professions is being changed. Now information specialists have to work as a e-information resources in which various professional groups are expected to map a strategy that leads to produce, manage, maintain and service the information. Information professionals have following skills:

- **Knowledge and skills:** Librarians need to know understand -
- Knowledge of resources (resources, Internet)
- Teleological facilities and resources(computer, LANs)
- Financial resources
- Human resources management

- **Competencies that required to possess in LIS professionals-**
  - Acceptance of change
  - Knowledge of user interaction with knowledge resources
  - Provide quality service
  - Be adoptive, flexible and resistant
  - Be resourceful
  - Possess excellent communication skills; constantly update personal knowledge with latest development
  - Create awareness among the users
  - Be an information management strategist
- **Technical knowledge required:**
  - Operating systems – Windows, UNIZX, LINUS
  - World processing, Graphics, Spread sheet & presentation
  - Database Management Systems in including the skills in Bibliographic Database Management Systems
  - General purpose programming, Networking
  - Web page Development and Content Management
  - Information Retrieval software for online, CD-ROM
  - Library software packages, acquaintances with Digital Library Tools.

8. Conclusion

The role of librarian has change in the digital library era. It is, therefore pertinent on the part of the librarian to acquire new skills required for developing and managing the digital libraries. The library and information professionals are rq1uuired to acquire such knowledge and skills as the library is one of the highly IT influenced service profession. The empowerment of library and information professionals with it skills is aimed at providing services that are expected of form the clientele in the new environment. Academic librarians have to be serious in developing their own proficiency as well as must find out how to develop the professional competency in general. Since the users are more prone to on-line and electronically delivered services, the growing role of the librarian in college would lie in information counseling, training, advising users on services and information products appropriate to their needs and how best to use them.

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E-Resources in Agricultural Sciences: *An Overview*

Harshal R.Nimbhorkar

Information and communication technology (ICT) has thrown a new challenge to the libraries. The technology has shown a great impact on the services of the libraries. Libraries use ICT for better services and satisfying diverse user needs. Libraries have transformed into digital and virtual libraries where books, journals, and magazines have changed into e-books, e-journals etc.This has increased the global dissemination of information. Electronic resources (e-resources) are easily accessible in the remote areas. The e-resources solve storage problems and control the flood of information. Print sources are being digitised. There is a great need to study the use of e-resources and investigate the factors that are a hindrance to their use, introduction, concept, definitional analysis and advantage and disadvantages using e-resources. It's meaning and need of e-resources also include various types of e-.resources, and databases using agricultural sciences. Like that cera.krishiprabha, egranth, krishikosh etc.also discussed it's related objectives.

Internet, e-resources, CDROM, e-journals, e-books, search engines, ICT, agriculture databases.

1. Introduction

The internet through we can access to unlimited sources of information and search engines are continuously being advanced to provide efficient ways to help users to find what they want. The internet eases and increases access to a large amount of data, saves time and money, and provides an opportunity to consult several experts with a single request (via discussion groups), and more independence from specific times and places for information seeking. Technology has penetrated all areas of life. Libraries use information and communication technology (ICT) for better services and satisfying diverse users' needs. Libraries have transformed into digital and virtual libraries where books, journals, and magazines have changed into e-books, e-journals etc.

This has increased the global dissemination of information. Electronic resources (e-resources) are easily accessible in the remote areas. The e-resources solve storage problems and thus control the flood of information. This is due to the continuous development of ICT and its impact on library collection development policies due to changing demand of users for the pin-pointed and exhaustive information within a short time. With the growing popularity of e-resources, the traditional libraries are gradually migrating from print documents to e-resources where providing access to information is considered more important than owning it.

2. E- Resources in Agricultural Sciences

The rapid growth of ICT has changed the functioning of the libraries, Database information system, Web OPAC has replaced the traditional libraries, and the presence of ICT inside the Library can be seen on the following areas.

- Open Source Journals
- CD-ROM Databases
- CeRA (Consortium of E-Resources)
- Digital Repository
- e-Granth (NARS)
- Krishiprabha

3. Open Source Journals

There are several open access journals available on the internet which the agricultural users can access in the time of their need. A few such resources are mentioned below.

- Indian Journal of Agricultural Science
- Indian Journal of Animal Science
- Karnataka Journal of Agriculture Sciences
- Current Science
- The Madras Agricultural Journal
- Journal of Tropical Agriculture
- Krishi Munnade
- Proceeding of The Royal Society Biological Sciences
- Directory of Open Access Journals - Agriculture & Food Sciences
- Journal of SAT Agricultural Research (ICRISAT)

4. Web OPAC

The development of ICT has influenced the implementation of OPAC available through internet. By searching and browsing online library catalogue, the end users can directly order or transmit request directly to the Web OPAC available at different University Libraries.

5. CD-ROM Databases

CDROM databases provide mainly abstracting and indexing services. Those are the most cost effective tools for information storage and retrieval. Information can be stored in different formats such as text, audio, video etc. Searches can be made through author, subject, Journal Title, Publisher etc. Boolean operators like AND, OR, NOT can be used to refine searches. Those CDROM databases not only minimize subscription cost but also facilitate quick and speedy search/Some of the important CDROM databases of Agriculture are AGRIS, AGRICOLA, CAB abstracts etc

6. AGRICULTURE DATABASES

- **AGRIS:** AGRIS is the International Information System for the Agricultural Sciences and Technology. Together with CARIS, (Current Agricultural Research Information System), AGRIS is maintained; promoted and disseminated all over the world by mean is of a network of scientific documentation centers.
- The complete AGRIS database can be found on the Internet at http://www.fao.org/agris. The latest version of the multilingual agricultural thesaurus, AGROVOC, is now accessible on the Internet at http://wwwfao.org/agrovoc; in addition, details on 30 000 agricultural research projects and their current status as reported by the CARIS participating centre can be consulted at http://www.fao.org/agris, and are available on CD-ROM,

- **AGRICOLA (Agricultural On-Line Access):** It is a database created and maintained by the United States Department of Agriculture (USDA). The database serves as the catalog and index for the collections of the United States National Agricultural Library, but it also provides public access to information on agriculture and allied fields. AGRICOLA indexes a wide variety of publications covering agriculture and its allied fields, including animal and veterinary sciences, entomology, plant sciences, forestry, aquaculture and fisheries, farming and farming systems, agricultural economics, extension and education, food and human nutrition, and earth and environmental sciences.

- **CAB ABSTRACTS:** Covering the literature from 1910 to 1972, CAB Abstracts Archive makes over 1,860000 records on every aspect of agricultural science, veterinary medicine, nutrition and natural resources, available electronically for the very first time. The Archive contains seminal research that will help today's researchers: Much of the research covered in the archive such as climate change / biodiversity / pest control / pollution / animal diseases (such as TB and avian flu) / food production / managing natural resources / plant and animal breeding is still relevant today.

7. Consortium Based E-Resources

An Agricultural Library is a special library which primarily renders service to the policy makers, specialists, scientists, teachers, students, researchers, and farmers in apiculture and allied subjects. To maximize discipline-wise coverage, to supply economics of pricing models given by publishers for using additional advantages like unlimited access, unlimited downloads, easy accessibility, anywhere at any time accessibility, full-text downloads, etc., made the authorities of ICAR to think about formation of e-Consortium under the Project of *National Agriculture Innovation Project (NAIP)* in the name of CeRA.

- **Consortium for e-Resources in Agriculture (CeRA):** CeRA was launched successfully on 30 April 2008 at its headquarters at Indian Agricultural Research Institute (IARI), New Delhi. The purpose of CeRA is:
  - To develop the existing R & D information resource base of ICAR institutes/ State Agricultural Universities (S AU) etc,
  - To subscribe e-journal and create e-access culture among scientists/teachers in ICAR institutions/Agricultural universities..
  - To develop a Science Citation Index (SCI) facility at IARI for evaluation of scientific publications.
  - To access the impact of CeRA on the level of research publications measured through Science Citation Index (SCI)
- **Digital Repository (Krishiprabha):** Through this project all agricultural research scholars can get the benefit to access the digital e-theses repository free of cost. KrishiPrabha is a full-text electronic database of Indian Agricultural Doctoral Dissertations submitted by research scholars to the 45 State/Deemed Agricultural Universities during the period from 1.1.2000. to 31.12.2007This database, listing about 7500 Doctoral Dissertations with a full text of about 6000 Dissertations has been created by Nehru Library, Ch. Charan Singh Haryana Agricultural University, and Hisar with financial support from Indian Council of Agricultural Research, New Delhi under its *National Agricultural Innovation Project* having the following objectives:
  - To develop, organize and sustain knowledge base of Indian Agricultural Dissertations in digital form and make it accessible online.
  - To develop a standard format for submission of e-theses to the SAUs/ DUs.
  - To upgrade skills of human resources of SAUs/DUs.
  - To publish a journal in electronic form/ hard copy form from the Database.
- **KrishiKosh**: An Institutional Repository under *National Agricultural Research System* (NARS) KrishiKosh The repository of knowledge in agricultural and allied sciences ,having collection of old and valuable book ,records and various documents spread all over the country in different libraries of research institutions and state agricultural universities (SAUs) (http//:www.Krishikosh.egranth.ac.in/handle/1/466)

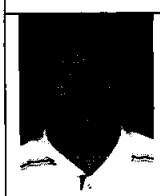
- **e-Granth:** The aim of this project is strengthening of digital library and information management under *National Agricultural Research Scheme* (e-GRANTH) .The lead is being taken up by *Indian Agricultural Research Institute* (IARI), New Delhi with the following objectives:
  - To create Online Public Access Catalog (OPAC) under "Indian Agricultural Research Group Catalogue" of all 12 library resources with Online Computer Library Center (OCLC) partnership.
  - To digitize important institutional repositories (limited to IARI, IVRI, Izatnagar, Bareilly, and ANGRAU, Hyderabad and UAS, Bangalore) including rare books and old journals and make them open access under NARS.

5. Conclusions

The role of information and communication technology (ICT) and internet technology through us. We can access various types of electronic resources available in India. Such as Cera, eGranth, Krishiprabha, krishikosh etc. The field of agricultural sciences student's faculty staff, and researcher, and agricultural scientists will accessed his valuable information via internet searches through different types of websites. Also they can access open source journals, national and international databases.

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Impact of Economic Factors on the Reading Habits of School Students

Paramjeet K. Walia **Nitu Sinha**



The reading habits are nowadays influenced by a host of factors. This paper is an attempt to investigate whether economic means seem to affect the reading priorities of school students studying in various types of schools in Delhi. It also discusses the differences in conventional reading habits of teenagers in public/convent schools as compared to government/aided schools to evaluate the impact of this economic divide. For this purpose a survey among school going teenagers aged between 12 and18 years was done among public/convent and government/aided school goers using a semi-structured questionnaire and it was found that reading as a leisure activity was less popular in Govt./Aided school students (15.9%) as compared to Public/Convent school students (26.8%). A significant difference in information source for books and preferred language was observed between two groups. However, no significant difference in preferred content and source was observed.



Economic divide, reading habits, teenagers school students

1. Introduction

Reading books is one of the most productive activities of human beings. It has the capacity to ignite imagination and creativity. It's a prerequisite to attain higher truths and the ability to broaden one's horizons. Those who start this habit of reading books from their early childhood days are observed to display strong language skills as well as an impeccable ability to grasp. Besides these the act of reading inculcates greater levels of concentration and enhances conversational skills. As book reading directly impacts the youths---one the most important assets for any nation, it plays a crucial role in nation building. A nation with a culture of reading is bound to have high percentage of educated intellectuals with strong values. For a country such as India with a youth population of about 400 million of which 60% resides in rural areas 'reading culture' has even greater implication. Learning to read is among the most important academic skills that provide the foundation for a child's future success at school. According to the Report of the Commission on Reading, reading is considered as a cornerstone for success, not just in schools, but also throughout the adult life of an individual. Reading is regarded as a process, a mode of thinking, a kind of real experience and involves many complex skills: the ability to perceive printed words, to skim for information and then perhaps read intensively. In their research with adult readers, it was found that reading contributes significantly to job success, career development, and ability to respond to change (Karim and Hasan, 2011).

Leppänen *et al.* (2011) also emphasizes that as early as the beginning of primary school children's reading skills contribute to their reading habits, such as reading books, magazines and television subtitles. Reading acquisition is of importance in the formation of reading habits: it was particularly after the basics of reading had been learned that out-of-school reading began increasingly to contribute to children's subsequent reading skills.

However, the advents of internet age and advancement in overall Communication Technology have altered reading habits considerably. It continues to change at brisk pace. These days a large number of youths have access to new technology and they are driving it to the maximum. Consequently, they have found new avenues to spend time - posting on social networking sites, instant chatting on mobile phones, viewing videos on internet and mobile, online games etc, the list is virtually endless. However, at the same time it has also opened multiple channels for transmission as well availing valuable information in an affordable and easy way. The conventional book is slowly being replaced by electronic book and electronic resources (Chaudhary and Low, 2009; Low and Chaudhary, 2009).

2. Scope And Research Methodology

The present study was carried out with an aim to study the reading habits of teenagers in Delhi. Respondents were enrolled using a stratified clustered sampling approach. In order to make the sample representative of the teenage population of Delhi respondents were enrolled from government (three), public (three) as well as convent schools (two) after obtaining permission from the respective authorities. Conventional reading was defined as reading of printed form of books, periodicals, journals, magazines and newspapers.

Responses were collected on a semi-structured questionnaire developed to assess the most preferred activity of teenagers, their self perception as a reader and types and genre of fiction and non-fiction books preferred by them. Information related with source of information about books, source of access and preferred language was also gathered.

In total, 265 subjects were enrolled in the study and were handed over the questionnaire. Out of these, 223 subjects submitted their questionnaires. Thus the response rate was 84.5%.

3. Data Analysis and Interpretation of Data

The semi structured data was coded and categorized. The responses thus obtained were entered into computer using Microsoft Excel software. Data was then subjected to statistical analysis using Statistical Package for Social Sciences Version 15.0. Chi-square test was used to compare the data. The confidence level of the study was kept at 95%, hence a "p" value less than 0.05 indicated a statistically significant association.

Table 1: Distribution of Teenagers According to Most Preferred Leisure Activity (n=223)

SN	Characteristic	Statistics
1.	Playing outdoors	38 (17.0%)
2.	Sleeping and relaxing in bed	5 (2.2%)
3.	Creative activities (craft, music and drawing)	82 (36.8%)
4.	Studying	29 (13.0%)
5.	Gossiping	21 (9.4%)
6.	Reading books	46 (20.6%)
7.	Any other	2 (0.8%)

Table 2: Association of Different Aspects of Reading Habits with Type of School

SN	Variable	Public/ Convent (n=97)		Govt./Aided (n=126)		Significance of Association	
		No.	%	No.	%	χ^2	P
1.	Reading as leisure activity	26	26.8	20	15.9	4.000	0.026
2.	Considering oneself as an avid reader	48	49.5	72	57.1	1.293	0.255
3.	Like fictions*	75	77.3	94	74.6	0.220	0.639
4.	Like non-fictions*	55	56.7	83	65.9	1.955	0.162
5.	Like both fiction & non-fiction*	65	67.0	92	73.0	0.949	0.330
Preferred fictions*							
6.	Thriller	58	59.8	64	50.8	1.792	0.181
7.	Classics	43	44.3	37	29.4	5.335	0.021
8.	Romance	44	45.4	51	40.5	0.535	0.465
9.	Comics	44	45.4	41	32.5	3.819	0.051
10.	Science fiction	25	25.8	41	32.5	1.204	0.272
11.	Horror	40	41.2	57	45.2	0.357	0.550

Preferred Non-fictions*							
12.	Comics	44	45.4	45	35.7	2.127	0.145
13.	General knowledge	34	35.1	49	38.9	0.345	0.557
14.	Movie magazines	27	27.8	44	34.9	1.268	0.260
15.	Philosophy	26	26.8	28	22.2	0.627	0.428
16.	Autobiographies	25	25.8	34	27.0	0.041	0.839
17.	Biographies	24	24.7	30	23.8	0.026	0.872
18.	Current Affairs	21	21.6	42	33.3	3.691	0.055
19.	Sports	27	27.8	41	32.5	0.572	0.449

*Includes those who cited their response as most preferred & preferred

Table 3: Association of Demographic Variables with Sources of Information for Locating Books, Sources of Access and Preferred Language

SN	Variable	Public/ Convent (n=97)		Govt./Aided (n=126)		Significance of Association	
		No.	%	No.	%	χ^2	P
1.	Source of information for locating books						
	Library	27	27.8	59	46.8	27.076	0.001
	Bookstores	11	11.3	10	7.9		
	Blogs	2	2.1	8	6.3		
	Friends	22	22.7	7	5.6		
	Family	1	1.0	4	3.2		
	Newspapers	2	2.1	6	4.8		
	Magazines	3	3.1	1	0.8		
	All these	27	27.8	31	24.6		
	Others	2	2.1	0	0.0		
2.	Sources of access						
	Purchase	24	24.7	31	24.6	2.088	0.554
	Borrow from friends	13	13.4	11	8.7		
	Borrow from library	58	59.8	83	65.9		
	Others	2	2.1	1	0.8		
3.	Perceived utility of books						
	Passing exam	9	9.3	22	17.5	13.842	0.008
	Having fun	24	24.7	11	8.7		
	To be well informed	29	29.9	46	36.5		
	To be well developed	31	32.0	45	35.7		
	To while away time/ Multiple	4	4.1	2	1.6		
4.	Preferred language						
	English	94	96.9	79	62.7	36.903	<0.001
	Hindi	3	3.1	45	35.7		
	Others	0	0	2	1.6		

4. Results

- **Profile of Respondents:**
- **Age:** Age of students ranged from 12 to 18 years. The mean age of students was 15.17±1.45 years. More than half (n=124; 55.6%) students were aged fifteen years or less.
- **Gender:** Majority of students were females (61.4%). The male to female ratio of study subjects was 0.63:1.
- **Type of Schools:** A total of 126 (56.5%) subjects were from government/aided schools whereas remaining 97 (43.5%) were from public/convent schools.
- **Class:** Majority of studying in classes 8 to 10 (n=155; 69.5%). Remaining 68 (30.5%) students were studying in classes 11 and 12.
- **Most Preferred Leisure Activity:** Creative activities such as craft, music and drawing were the most preferred activities (36.8%) followed by reading books (20.6%), playing outdoors (17.0%), studying (13.0%), gossiping (9.4%) and sleeping and relaxing in bed (2.2%). There were 2 (0.8%) students who preferred other activities during leisure (Table 1).
- **Aspects of Reading Habits:** Significantly higher proportion of students from public schools (26.8%) as compared to those in government schools (15.9%) considered reading as a preferred leisure activity (p=0.026). However, no significant difference between two groups was observed with respect to self perception as avid reader, liking towards fiction, non-fiction and both fiction/non-fiction books (p>0.05). (Table 2)
- **Types of Fictions Preferred:** With respect to preference for different types of fictions - thrillers were preferred by majority of students in both the types of schools, thus showing no significant difference between two types of schools (p=0.181). However, classics were preferred by significantly higher proportion of students from public schools (44.3%) as compared to those in government schools (29.4%). No significant difference between students from two types of schools was observed with respect to other types of fictions (Table 2).
- **Types of Non-fictions preferred**: In non-fiction category, public schools students had comics as the most preferred type (45.4%) followed by general knowledge books (35.1%) whereas in government schools, general knowledge books were most preferred (38.9%) followed by comics (35.7%). For other types of books the preference rate ranged from 21.6% to 27.8% among public school students whereas this rate ranged from 22.2% to 34.9% in government school students. Statistically, no significant difference between students from two types of schools were observed for any of the non-fiction types (p>0.05) (Table 2).
- **Source of Information about Books**: Library was the most common source of information about books for both public and government school students, however, the proportion of public school students getting information about books from library was much lower (27.8%) as compared to that in government schools (46.8%). Public school students tended to get information about books in a relatively much higher proportion from friends (22.7%) as compared to those in government schools (5.6%). Information about books was received from multiple sources by 27.8% of public school students as compared to 24.6% government school students. Blogs, bookstores, newspapers, magazines and other sources were less commonly used sources of information regarding books in both the types of schools. Statistically, there was a significant difference in sources of information about books between two types of school students (p=0.001).
- **Source of Access:** Not much difference in source of access for books was observed between two groups. Almost one-quarter of students in both types of schools (24.7% in public and 24.6% in government schools) used to purchase the books. Borrowing from friends was reported by 13.4% of public school and 8.7% of government school students. For both types of schools borrowing from library was the most common source of access (59.8% public and 65.9% government). Other sources

of access were reported by 2.1% of public and 0.8% of government school students. Statistically, there was no significant difference between two types of schools with respect to source of access (p=0.554) (Table 3).

- **Perceived Utility of Books:** Majority of students from public schools (61.9%) and government schools (72.2%) were of the view that books are helpful in getting well informed and well developed. However, reading for fun was reported by almost one quarter of public school students (24.7%) as compared to only 8.7% of government school students. Similarly, only 9.3% of public school students found reading books to be helpful in passing exams as compared to 17.5% of government school students. Reading books for time-pass/other reasons was reported by 4.1% of public school and 1.6% of government school students. Statistically, differences in perceived utility of reading books were significant between two groups of students (p=0.008).
- **Preferred Language**: With respect to preferred language, except for 3.1% public school students who preferred to read in Hindi, all the other public school students (96.9%) preferred to read in English. In contrast, although majority of government school students (62.7%) also preferred to read in English, however, there were 35.7% government school students who preferred to read in Hindi and 1.6% in other languages. Statistically, there was a significant difference between two groups of students with respect to preferred language (p<0.001) (Table 3).

5. Discussion

The findings in present study revealed some concerning facts regarding activity profile of teenagers. It was disturbing to see that physical activities like sports and outdoor games were losing their grip as the most preferred activity of the teenagers. In present study except for 38 (17%) subjects who listed playing as the most preferred activity, all the other respondents listed indoor activities as most preferred activities. These findings are reflective of the longitudinal trends of decreasing physical activities among teenagers as a result of urbanization as reported by Swaminathan (2011). Decreasing sports facilities, declining law and order, lack of time owing to pressure of studies and invasion of electronic and digital media which has come up with virtual games and sports can be held responsible for this decreasing trend of participation in outdoor games and sports.

One of the encouraging things was that more than one-third (36.8%) students preferred to be involved in creative activities such as craft, music and drawing (36.8%). Over the years, hobbies have emerged as one of the career options. Television talent shows such as India's got talent, Indian Idol and Dance reality shows have also motivated the teenagers to pursue their hobbies seriously and explore it as an optional career.

It was disturbing to see that reading as the most preferred activity was reported by only 20.6% students. The findings suggest that reading as a means to get information and experience through description is losing its charm. One of the reasons for this might be the availability of other means of obtaining information. Over the years rise of Internet and Television as a source of information has changed the preferences of teenagers with respect to their inclination towards conventional book reading.

It was interesting to observe that despite reading and studying reported to be favourite activities by only 20.6% and 13.0% (total 33.6%) students, majority of students considered themselves to be avid readers (53.8%). The findings suggested that self perceptions of teenagers were often misjudged and were not based on factual information. Mahajan (2009) also found a substantial difference between self-perception of adolescent girls when compared to factual information.

In present study reading as a leisure activity was reported by relatively larger proportion of public school students as compared to government school students. One of the reasons for this might be availability of time as well as books to the public school students who generally hail from economically well-to-do families, have domestic helps to do the household works whereas the government school students do not

have such facilities. Economic divide in reading preferences and skills have been studied by Indrisano and Chall (1995) who found that gaps in reading skills exist between poor and middle class students even from primary classes and continue to widen further with increasing level of education.

Among most preferred types of books, fiction was most preferred. The growing pressures of life and tendency to look the resolution of problems of life in the virtual world of fiction and fantasies seems to be reflecting the tendency of escapism amongst the teenagers today (Fitzgerald, 2008; Ahmad Ghazali *et al.*, 2012).

Among different genre of fiction books, thrillers and horror books were most preferred while classics were least preferred. The trends indicate a sense of adventurism among the teenagers which they were trying to fulfill in the imaginary world of fictions. Teenage reading tastes closely match those of adult readers. Fantasy seems endlessly popular. These findings are in close agreement with those observed among British children (NFM/MORI, 2003).

Among non-fiction books too, a wide spectrum of preferences of teenagers was observed. At the one end, highest proportion of most-preferred responses were obtained for comics (17.0%) which can be related with the preference to lighter content, general knowledge (15.7%) and philosophy (14.8%) were not far behind. Thus among non-fiction content, the preference of teenagers seems to be guided through variation in their objectives in life and they were generally not being read as pastimes but were certainly being read with a set goal in their minds. It must also be kept in mind that public/convent schools with better library resources and institutional motivation might be instrumental in encouraging reading as leisure activity and inculcating quality reading among their students (Mahajan, 2010).

In present study, with respect to source of information about the books government school students were mainly dependent on the school library, however, for public school students, friends were a major source of information about the books. One of the reasons for this might be the fact that reading as a leisure activity was less popular in government schools and that might be responsible for fewer members of friend-circle having reading as a leisure activity and eventually reduced scope of discussions regarding books within the friend circle. Another important inference drawn from the above finding is that students in government schools generally read or select from whatever is available to them at libraries whereas those in public schools tended to read the stuff they want or chose to read. The fact that the source of books for both the types of students mainly comprised borrowing either from libraries or from friends indicate that the book selection in libraries at two groups of schools (public and government) were driven by two different sets of determinants – in public schools where students get information about books mainly from sources other than library, the selection of books is driven by demand from the students as the source of books has been stated to be library by majority of students from this group whereas in government/aided schools the book selection is driven by the school authorities. This finding is of vital importance as it could be responsible for lower proportion of government school students to opt for reading as their leisure activity. It might be possible that when students have a limited role in book selection, then they are less interested to read the books.

With respect to perceived utility of books –majority of students from both the group of schools perceived to be well informed and to be well developed as the perceived utility of books. These findings are in concurrence with the findings of NFM-MORI assessment that educational benefits of reading have not escaped[Error! Bookmark not defined.]. However, proportion of students reading for fun was much higher in public school students as compared to government school students. In contrast those considering the books to be useful for passing the exam were higher in public schools as compared to government schools, thus once again highlighting the changed priorities for reading.

With respect to preferred language of reading, it was interesting to see that majority of students irrespective of type of school preferred reading in English. However, the concerning fact was that in Public schools, the national language (Hindi) was much ignored by the students. Another concerning fact was that even in government/aided schools, Hindi was losing the place as the preferred language for reading.

Historically, the English language has been the official working and link language of the Government of India. Those well versed in this language have always commanded awe and authority in the country. Even after more than 60 years of independence, English is still valued as a language of the privileged and powerful, so more and more people in the country intend to acquire the skills of the language and socialize in it. Due to the colonial legacy and the cultural values passed on to the next generations, the fact remains that no other language in the country is endowed with as much value, power, and respect as is the English language. Also, in the recent past, the process of globalisation and liberalization has acted as a catalyst in the rise of English language in India (Dutt and Garg, 2012).

The findings thus suggest that the economic divide is playing a significant role in determining the reading habits of teenagers which eventually might be responsible in a vertical divide in society.

6. Conclusion

This exploratory study revealed significant differences in reading habits, preferences, source of reading, perceived utility of reading and preferred language of reading between public school and government school students. These findings indicate a brewing societal gap on economic lines. The findings are alarming for the policy-makers to fill the gaps and remove the disparities.

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Impact of information Technology on College Libraries of Ferozepur District, Punjab: *Role of the Librarians*

Mohinder Kaur Gill



This article discusses the impact of Information Technology on the library resources, library house keeping activities, library services, library professionals, and challenges to librarians and changed role of Librarians in this age of information Technology. Data has been collected from 11 libraries of different colleges of Ferozepur district. It defines Information Technology and elaborates its importance and defines new responsibilities of the Librarians.



Information Technology, Impact of IT on Libraries, New responsibilities of Librarians.

1. Introduction

In the age of information technology, there is a remarkable change in the form of library resources, library infrastructure and library services. IT has fundamentally affected the operations of the library and information services. It also has a great impact on the training of library staff and library users at various levels. With the paradigm shift to computing technology and paperless work places, IT has become a household phrase "IT is defined as an industry of computers networking, software programming and other equipment and processes to store, process, retrieve transmit and protect information. "In terms of infrastructure, Libraries have to give space to public computer facilities and librarians need additional training in order to be well equipped to deal with queries related to modern research techniques and online resources as well as traditional ways. Now, the librarians have to digitize the library archives and other old and rare material of the library. Librarians have to build an Institutional Repository of the dissertations of M. Phil, PhD theses and research papers of the college faculty. Library has to provide an efficient and effective check out and check in Systems, a faster method of locating resources and availability of items. Modern systems are also beneficial to the library users who are able to reserve and renew items online. With the help of OPAC readers can come to know whether a particular book or a journal is available in the library or not? by exploring the online catalogue of a library. So far as library infrastructure is concerned, college authorities are spending a lot of money on computers, printers, scanners, barcode readers, Library Management Software and their maintenance. There is a revolution in storage devices and improved library professional capabilities, changing needs of the users. College authorities are investing a big amount of money on infrastructure of libraries, for the automation of libraries. In such a situation, there is a need to justify the investment and to prove positive impact of new resources and services.

2. Objectives of the study

- To understand the impact of Information Technology on Libraries.
- To know the present automation status of the Libraries.
- To understand the automation problems of the libraries of the following Colleges.
- To know the type of E-Resources of the Libraries.
- To know the kind of Consortia the libraries have.

3. **Methodology:** A questionnaire method was used for carrying out the research project. The Librarians were approached individually and interviewed personally. For clarity librarians were also contacted telephonically because it was necessary to achieve the objectives of the survey.

4. Scope of the study

- Dev Samaj College for Women (DSCW) Ferozepur City
- R.S.D. college, Ferozepur City.
- D.A.V. College For Women, Ferozepur Cantt.
- G.N. college Fzr Cantt
- Genesis
- S.B.S. college, Fzr.Cantt
- Ferozeshash college of Engineering and Technology, Fzr.
- Ferozeshash Institute of Management
- Govt. College Fazilka
- Govt. College Zira
- Ad. College Dharamkot

Table 1

Name of The College	On-line Collection Development	CDs	DVDs	E-Books	E-Journals	Membership of Cosortia
DSCW College for Women, Fzr. City	Yes	50	150	100	7500	N-List, DELNET
RSD College For Women	Yes	25	6	*	*	*
DAV Coolege for Women	Yes					N-List
G.N. College	*	*	*	*	*	*
S.B.S.Engineering College	Yes	500	50	*	*	AICT
Ferozeshah Engineering College	Yes	1000	500	*	*	*
Ferozeshah Instirtute of Management	Yes	700	200	*	*	*
Genesis	Yes	50	15	*	*	*
A.D. College Dharamkot	*	*	*	*	*	*
Govt. College Zira	*	*	*	*	*	*
Govt.College Fazilka	*	*	*	*	*	*

- **Online Collection Development:** At first, we collect documents, from Venders, Publishers and Book stalls. But now we order books and journals online. We get books by Cash on Delivery. These are available on cheap rates. There are no. of sites like Amazone, Flipkart, Home Shop 18, Jungli.com etc. Rare-Books, which are not available on book shops, are now available on-line. After comparing price from different sites, we can order books. Table 1. shows that seven Colleges Purchase books on-line. Four colleges, from Vendors and book shops.
- **E-Resources:** In past, library collection referred mostly to print materials but in this age of IT, all the libraries need to get E-resources on line as well offline. It includes CDs, DVDs, Audio video Cassettes, E-books, and E-journals. In order to enhance the research capability of a library, Resource sharing has become an important part of a library. So Libraries have to become the members of a number of consortia. Table 1 shows , accept four libraries; all other seven libraries have CDs, DVDs. One library has E- books and E- journals. Two libraries have membership to N-List, one of INDEST-AICTE. One has membership of both N-List and Delnet. But eight libraries do not have membership of any consortium.

Table 2

S. No.	Name of The College	Librarian	Name of The Software	Fully Computerized	Partial Computerized	Planning to Computerized
1	DSCW College Fzr. City	1	Libsys	Yes	*	-
2	RSD College For Women	1	College made software	*	*	Yes
3	DAV Coolege for Women	1				
4	G.N. College	*	*	*	*	*
5	S.B.S.Engineering College	1	Soul	*	Yes	Yes
6	Ferozeshah Engineering College	1	*	*	*	Yes
7	Ferozeshah Instirtute of Management	1	*	*	*	Yes
8	Genesis	1	E -Granthyalya	Planning to fully Computerized	Yes	-
9	A.D. College Dharamkot	1	*	*	*	Yes
10	Govt. College Zira	*	*	*	*	*
11	Govt.College Fazilka	*	*	*	*	*

Table 2, shows that one library is using Libsys, one is using SOUL another is using E-Granthalya and fourth is using college-made library Management software for house keeping activities. Only one library is fully computerized, four libraries are partially computerized and six libraries are planning to computerize their house keeping activities.

Table no. 3

S. No.	Name of the college	Cataloguing	Bar-coded Accession no. & Printed Spine Labels	Circulation	Serial Control	Newspapers Control	Stock Verification
1	DSCW College for Women, Fzr. City	Yes	Yes	Yes	Yes	Yes	Trying to do
2	RSD College For Women	Partially	*	*	*	Yes	*
3	DAV Coolege for Women	Partially	*	*	*	Yes	*
4	G.N. College	*	*	*	*	*	*
5	S.B.S.Engineering College	Partially	*	Yes	*	Yes	*
6	Ferozeshah Engineering College	*	*	*	*	Yes	*
7	Ferozeshah Instirtute of Management	*	*	*	*	Yes	*
8	Genesis	Partially	*	Yes	*	Yes	*
9	A.D. College Dharamkot	Partially	*	*	*	Yes	*
10	Govt. College Zira	*	*	*	*	*	*
11	Govt.College Fazilka	*	*	*	*	*	*

- **Cataloguing:** After purchasing and installing Library Management Software in Library, first important function is to make database. We should feed data of any book from the book itself rather than Accession Registers. In order to make Catalogue according to AACR II rules, only library experts should train other people. Table 3 shows that only one library has fully computerized Catalogue. Partially computerized libraries do not have full details about the book in computerized catalogue.Computerized Csatalogues have replaced the card Catalogue and much of the shelf space.
- **Circulation:** In two libraries, the library documents are issued and returned with the help of computer. Other libraries are not able to perform this function with computer. They are of the view that Circulation of documents is very easy and it saves the time of the library staff and library users. You have to scan the bar-coded accession number of the book and information of the book will appear on the screen. Then you will scan the bar-coded identity card of the user and all the information of the student will appear on the screen and then press ok. It is very easy to check in and check out the documents.
- **Bar-coded Accession Numbers and Printed spine labels: After Cataloguing the Book, we get** Bar-coded Accession Numbers and Printed spine labels. Only one library is performing this activity. Other 10 libraries are not able to perform this function.
- **Serials control with Computer:** Only two libraries are managing periodicals with the help of computer.
- **Newspapers control:** Accept three libraries, almost all the libraries are keeping the record of newspapers prepares and prepare the bills of newspapers with computer in excel. All librarians accept that with the help of computer we can get a very neat and clean bill of newspapers
- **Stock Verification:** Out of 11 Libraries only one, library is trying to verify stock with computer. Other libraries are doing this function manually.

Table no.4

S. No.	Name of The College	Skilled Persons In the Library	Un Skilled	Bar-coded Identity Cards for students	Instituitional Repository	OPAC
1	DSCW College for Women, Fzr. City	3	7	Yes	Yes	Yes
2	RSD College For Women	1	2	*		Yes
3	DAV Coolege for Women	1	2	*		Yes
4	G.N. College	*	*	*		*
5	S.B.S.Engineering College	1	2	*		Yes
6	Ferozeshah Engineering College	*	*	*		*
7	Ferozeshah Instirtute of Management	*	*	*		*
8	Genesis	1	1	*		Yes
9	A.D. College Dharamkot	1	1	*		Yes
10	Govt. College Zira	*	*	*		*
11	Govt.College Fazilka	*	*	*	*	*

Table no. 4 shows, six libraries have skilled librarians and some un-skilled persons. But they are trained by the skilled persons in the library.

- **OPAC:** Online public access catalogue of a library is a boon for users. It needs OPAC terminals. Only one library has three OPAC terminals. Others do not have such facility. With the help of OPAC, one can search the book by author, title, publisher, or key-words. It also includes Boolean Operators.

- **Institutional Repository:** Only one library has an institutional repository of research papers, Dissertations and theses of PhDs and M. Phil .This library is using Greenstone software for IR.

- **Bar-coded Identity cards for the users:** Only one library has Bar-coded identity cards for the library users. All other libraries do not have their own Institutional Repositories. These libraries are not able to give the facility of Bar-coded Identity cards for the users and not bar-coded accession numbers Printed spine labels for Books, because of the lack of fully library automation.

TABLE 5 - Internet Terminals and Printing Facilities

S. No.	Name of The College	Wi Fi/ BSNL	Number of Computers	Internet Terminals	Printer	Scanner	Photostat Facility
1	DSCW College for Women, Fzr. City	Wi Fi and BSNL	23	7	3	1	Yes
2	RSD College For Women	Wi Fi	7	4	*	*	Yes
3	DAV Coolege for Women				Yes		Yes
4	G.N. College	*	*	*	*	*	*
5	S.B.S.Engineering College	Wi Fi	6	5	Yes	*	Yes
6	Ferozeshah Engineering College	Wi Fi	1	1	*	*	Yes
7	Ferozeshah Instirtute of Management	Wi Fi	1	1	*	*	Yes
8	Genesis	Wi Fi	2	1	*	*	Yes
9	A.D. College Dharamkot	Wi Fi	1	1	*	*	*
10	Govt. College Zira	*	*	*	*	*	*
11	Govt.College Fazilka	*	*	*	*	*	*

- **Computers:** Accept three colleges , all other colleges have computers for their library work. One library has23 computers, other has seven computers and one has six computers. Government college libraries do not have even a single computer in their libraries. Govt. colleges are suffering more.

- **Internet terminals:** Accept four libraries including of Govt. colleges, others have internet facility in their libraries. All the libraries have WI-FI technology. One library has both,WI-FI and BSNL connection. These libraries provide Internet services to the staff and students. Most of the students get syllabus of their required subjects. They also use internet for getting answers of their reference questions. Some colleges also use internet for latest topics of their syllabus, for which books are not available in the market.

- **Xerox facility: :** Accept three colleges, all other colleges have Photostat machines for getting a copy of any kind of reading material. Thee colleges have Printers for getting a print copy of syllabus and other reading materials. One has scanner to scan rare material like old college Reports and other rare book material. Only one college has three printers and one scanner in the library. Others do not have this facility in the library.

- **Storage Devices:** Inforrmation Technology has given us a no. of storage devices Like Pen drives, Flash Drives, CDs, DVDs, Hard Discs, Mobile phones etc. teachers and students can download and store information from internet and different consortia in PDF form, word doc., P.P.T., and some times pictures. A librarian uses Hard Discs to take back-up of data and CDs are used for keeping digitized newspaper clippings, digitized annual reports,rare books and manuscripts of the college library.

5. Problems related to IT

All the college librarians wish to implement new techniques of IT in their libraries, but they are facing a lot of problems like problem of IT skilled staff. New comers, who are trained for IT skills, they leave the job after some time because they are not on permanent posts. Financial problem is very serious. There are problems of costly hardware and software and its maintenance charges and of system breakdown. We are working smoothly but because of virus problem, system does not work we have to move to old issue system. There are new changes in Information Technology at regular intervals. It is not easy to cope with the situation. Some colleges are of the view that it is not easy to convince the college authorities especially in Govt. Colleges.

Challenges to the Leadership and New role of the Librarian:

- Librarians always play a key role in Education. Information Technology has a great impact on libraries and information professionals. IT has put a number of new responsibilities on the shoulders of librarians .At present librarian is not the care taker but information Manager, Intranet content manager, technology manager, Developer of information Repositories, as a consultant, Knowledge Manager, Archive Manager, as product planner and Marketer etc. Now a librarian is performing a number of jobs for which he has not given any training during j his studies (especially old Librarians).
- Now librarians must be sound in storage, retrieval dissemination of information with the help of ICT. Now librarians can no longer be simply information providers or the "keepers of Knowledge." IT has changed the role of the librarian from a person whom students ask for assistance in finding information. The process of evaluating books and purchasing books is still vital to build a quality library collection but now do we make important and valid information available to our faculty and students that may appear on the web tomorrow? Or how do we make government documents available which no longer being printed but are only available on web.
- In case of Library automation, librarian has to play an important role with hundred percent involvement in all the tasks and with the spirit of belongingness. Data capturing of all the holdings of a library is a lengthy process. Carefully capturing of Bibliographical details of each and every book is a time consuming. So it should be done by Library professionals. To face the future academic needs of the user in e learning environment is to provide electronic access to all relevant information and integrate it on network across the world. Second challenge is to create a new physical library premises with computer network facilities.
- Third challenge is to develop new standards and skills for the library profession to meet the user needs in a proactive way.

6. Suggestions:

- Vacant posts of Librarians should be filled by the college authorities.
- Availability of staff especially in govt. college libraries needs immediate attention.
- Qualified staff with IT skills should be provided by the college authorities.
- Required infrastructure (Hardware, Software and skilled library staff) should be provided for the implementation of IT.
- College authorities should pay attention for the purchase of E- resources and on the automation of the libraries.
- Library staff should improve their IT skills on their own level by joining short-term computer courses.
- UGC should make it mandatory to organize one more Refresher Course for IT skills for Librarians as there is a constant change in IT At regular intervals. They should be given training for using free

library soft wares like KOHA, LIBSYS, E-Granthyalya., D-SPACE and GREEN-Stone for making Institutional Repositories.

- Librarians should attend National Conferences, Seminars and workshops in order to get training from time to time.
- Duration of In M-Lib Sci. course should More than one Year. All IT Skills related to library should be the part of this Course.

No doubt, number of Challenges of IT is there in front of librarians. But if the librarian takes these challenges as an opportunity, they can learn IT skills very easily. Because IT is very important to achieve our due status and to make the libraries real functional units. Librarians need revolutionize attitude if we are ever to succeed. Only IT can provide value added services to the libraries.

7. Conclusion

To some extent, eight Colleges are making use of IT in their libraries, but other libraries are not computerized because they do not have required infrastructure for the implementation of IT in their libraries. Posts of Librarians are vacant. The position of Govt. College libraries is the worst. They do not have library staff and not even a single computer in their libraries. For getting even syllabus (which is more important) of all the classes, they have to depend on the computer department. Accept Govt. colleges, all the colleges have E- resources in their libraries. Students and teachers are using storage devices to download data from internet and consortium.

Seven college libraries have Xerox facility and two colleges have printing facilities. Only one college has institutional Repository, Printer and Scanner. All library staff members want to update their IT skills. In this age of IT, Colleges need to automate their libraries. One library is fully computerized, four libraries are partially computerized. Six libraries are not computerized. Three libraries, out of six are planning to computerize .Three libraries do not response about computerization because the don't have library staff. Accept three libraries all the libraries of Ferozepur district are hybrid libraries because these have printed as well as electronic resources.

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Information Seeking Behaviour of Senior Secondary School Teachers: *A Case Study of Gurgaon and Mahendergarh District*

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Current knowledge of information seeking behavior of senior secondary school teachers is extremely limited. Main objective of this study is to determine the information seeking behavior of senior secondary school teachers in Haryana. The aim of this study is to determine teacher's information need and used source for getting their information. Mostly teacher need information for preparing class lecture and general awareness of current affairs. Mostly prefer source is used by teacher is book and internet. A questionnaire was designed for this study. This questionnaire comprehensively includes all aspects regarding information need and used source by the teacher. This study has examined the criteria of information seeking need and source of Sr. Secondary School teachers in Gurgaon and Mahendergarh district (Haryana). In this study an attempt has been made to examine the information seeking behaviour of CBSE and HBSE board school.

Information, Needs, Source, Seeking.

1. Introduction

The present era is called the "Information era". Information plays an important role in a person's personnel life as well as professional life. Everybody needs information in every step of his/her life. We need information in our daily routine life like administration, management & development. No system can run effectively without information. Abels (2004) mentioned that the frequency of use of Internet in1998-2000 had greatly increased. A specialist or researcher needs information to keep up to date and well known in his field of specialization. Our nation's economic and social growth depends on information. Everyone has to deal with information in many ways through life. Indeed, information has been described as the fifth need of man ranking after air, water, food and shelter Kemp, (1976). Knowingly or unknowingly, intentionally or unintentionally, all of us most of the time of our life and work are concerned with information, its generation, recording, processing, repackaging transfer, receiving, use and application. Sudha, K. (2013)

Man was born innocent or ignorant; they were the Teachers who played an important role to remove their ignorance. It is rightly said that the teachers are the maker of the nation, as without teachers no nation can develop and can make progress. It is a teacher who imparts education to a person with his knowledge and skill. A teacher is a person who provides education for pupils and students. The role of teacher is often formal and ongoing, carried out at a school or other place of formal education. The great scientist, doctors, engineers, scholars are only born because of the good teachers. A teacher is the foundation stone upon which every profession flourishes and growth of the nation. If we look at the past there were very prominent teachers such as Guru Dronacharya and Chankaya who played an important role in the Indian history. After parents it is the teacher who directs a person to choose correct path, and to achieve his goals. At such tender age when a student is not able the judge for its wrong and right, they are teachers who helps them to build a strong character. Teachers are like the guided who leads them in difficult phases of life and helps them shaping their future and henceforth the future of the nation. Thus the teachers play an important role in building strong nations and assist in the development and growth of the nation.

Information is human thoughts. When a need is felt for some things, the research takes place giving use to new imagination generating new ideas by human mind, that's is called information. A fact about any subject is called information. Shannon and Weaver "Information is any stimulus that reduces uncertainty." Ching-Chih Chen and Peter Hernon define information as "all knowledge, ideas, facts, data, and imaginative works of mind which are communicated formally and informally in any format." Information seeking refers to

the need and seeks of information which are required by teachers or researcher. Information seeking is the process to select source and way to find their requirement. Source and resources which are used for satisfied the need of teacher or researcher to know his/her related information is called information seeking.

When a person needs any thing, the process which satisfied requirement of a person is called Information seeking behavior. Information seeking behavior involves a set of action towards getting information as well as resources which helping for satisfied their need. Many factors are affecting the information seeking behaviours of teachers. The first factor is understand the purpose of information, the environment, personnel skills to identify the needs of information, source and channel which are used for getting information and barriers. Some definitions are given by different authors are as under:

Ching-Chih Chen has defined information seeking as follows, "Information seeking patterns are the paths pursued by the individuals in the attempt to resolve a need." Girja Kumar "Information seeking behavior is concerned with who needs what kind of information for what reasons; how information is found, evaluated and used." T.D. Wilson define "those activities a person may engage in when identifying his or her own needs for information, searching for such information in any way, and using or transferring that information." King defined information seeking behavior- as a manner in which a user conducts himself in relation to give information environment. It is there for regarded as essentially a process of interaction between the user and the rest of the information system.

From the above definition we can conclude that information seeking behaviour is start with need of information and end with the appropriate way to satisfy their requirement. Majid, Shaheen (2000) In his study he found that respondents used a variety of information sources for teaching and research. Books, law reports and statutes were considered more important. It is interesting to note that, although respondents perceived the IIUM library as effective in meeting their information needs, they prefer to first consult their personal collections. It might be due to easy and convenient access to the personal collection and/or unawareness about library collections, services and facilities. Josiah O. (2007) found in his study that the student's major need of information is related to academic and the major source is Internet. Devender Kumar (2009) found in his study information needs of faculty members and research scholars of Chaudhary Charan Singh University, Meerut that they faced difficulties in access because of problem of time to read or look for information in library and lack of library automation. Automation is the key factor in improving library services. Ansari and Devendra Kumar (2010) analyzed the information needs and information seeking behaviour of engineering and technology faculty members of selected engineering institutes of Utter Pradesh, India. The purpose was to investigate the types of information sources used by the faculty members, their preferred information formats, the importance and reasons for using certain information sources and the use of various formal, informal and electronic information sources.

Bhatti, Rubin (2009) indicated that information seeking may be by a wide variety of needs, including personal, professional, entertainment etc. The successful operation of a library depends to large extent on the choice of library collections. The collection should meet the needs and requirements of users. Consequently, librarian must be aware of how faculty seeks information. Knowledge of faculty information needs and information seeking behaviour is imperative for developing valuable collections, and improving facilities and services. It is recommended that library staff or reference librarian should focus on assisting users and help teachers to improve their information seeking and find out the types of information they needed.

Thanuskodi,S.(2009) found in his study information seeking behavior of law faculty at central law college, salem under the university of Annamalai, Tamilnandu that they faced problem to access the IT source because lack of awareness about their availability improper selection of materials or unfamiliarity with these product. Email Internet service is mostly used source by the faculty members where as other sources are used by a limited numbers of respondent. The reference staff of library is helping the users to learn the IT source. The faculty members need information for teaching as well as research.

2. Purpose of the Study

- To understand the nature of Information needs and information seeking behaviour of school teachers in Haryana.
- To know the dimensions of information seeking behaviour.
- To find out most preferred sources of information by the teachers.

3. Scope of the study: The study would cover the senior secondary school (C.B.S.E & H.B.S.E both) in Gurgaon and Mahenderagarh both government schools as well as public school.

4. Research & Finding:

A questionnaire was designed for this study. This questionnaire comprehensively includes all aspect regarding information need and most preferred source by the school teacher. In this study 250 questionnaire were distributed to the school teacher out of them 215 received. So that only 215 respondents are considered under this study. Subject wise respondents are Physics and Chemistry 16 from each, seventeen from Accounts & Commerce, Hindi and English responded are 26, 32, Economics and Math responded are 21, 31, History, geography and political science responded are 22, 15 & 8, sixteen responded from miscellaneous (responded one two from any subject) subjects. The weighted average and average method is adopted for this study. Information need of teachers subject wise are shown as under:

Weighted Average Accounts						
Priority	**WAL**	**WACA**	**WAS**	**WAP**	**WBA**	**WR**
First	6.4	0	0.5	0.5	0	0.5
Second	0.4	3.3	0.7	1.5	0	0.4
Third	0	1.6	0.3	1.4	0.5	0.5
Fourth	0	0.2	1.1	0.7	0.2	0.9
Fifth	0.2	0.1	0.4	0.1	0.6	0.2
overall	7	5.2	3	4	1.3	2.5

The table shows that the Accounts and Commerce teachers need information for preparing class room lecture showing weighted average 6.4. Second need of information arises for awareness of current affaris. The overall weighted average of lecture is 7 and current awareness is 5.2, highest comparing from other needs.

Weighted Average Chemistry						
Priority	**WAL**	**WACA**	**WAS**	**WAP**	**WBA**	**WR**
First	5	2.2	0	0.6	0.6	0.6
Second	3.3	3.3	0.6	0.6	0.6	0.6
Third	0	1.7	5	2.2	0	0
Fourth	0.6	0.6	0.6	4.4	0	0.6
Fifth	0	1.1	2.2	1.1	2.8	2.8
Overall	8.9	8.9	8.4	8.9	4	4.6

The digram reveals that Chemistry teachers require information for class room lecture showing weighted average of 5. They need information to prepare the project as well as for current affairs. The overall weighted average of lecture, project and current affairs is same.

Weighted Average Economics						
Priority	**WAL**	**WACA**	**WAS**	**WAP**	**WBA**	**WR**
First	3.8	1.6	0	0.9	0	0.3
Second	1	2	1.8	0.5	0	0.3
Third	0.2	1.1	0.6	1.1	0.2	0.6
Fourth	0.1	0.3	0.5	1	0.5	0.3
Fifth	0.2	0	0.3	0.1	0.3	0.4
Overall	5.3	5	3.2	3.6	1	1.9

The above shows that most of the Economics teachers search information for study materials. The weighted average for lecture is 3.8. The overall weighted average of lecture and current affairs is nearly equal.

Weighted Average English						
Priority	**WAL**	**WACA**	**WAS**	**WAP**	**WBA**	**WR**
First	5.9	2.8	0.9	0.3	0	0.3
Second	2.5	3.5	1.3	0	0.3	0.8
Third	0.2	1.5	1.5	1.1	0.9	0.9
Fourth	0.1	0.1	0.9	1	1.1	0.9
Fifth	0.1	0.1	0.5	0.6	0.3	0.4
Overall	8.8	8	5.1	3	2.6	3.3

It is analysied that English teachers give their first priority to preparing class room lecture for which weighted average is 5.9. Second priority is awareness of current affairs. The overall weighted average of lecture and current affairs is 8.8 and 8.

Weighted Average Hindi						
Priority	**WAL**	**WACA**	**WAS**	**WAP**	**WBA**	**WR**
First	9.1	1.8	0	0	0	0.9
Second	1.8	3.6	2.2	1.1	0	0.7
Third	0.3	2.5	2.7	0.3	0.8	0.5
Fourth	0	0.4	1.5	1.6	0.5	0.7
Fifth	0	0.1	0	0.6	1.3	0.4
Overall	11.2	8.4	6.4	3.6	2.6	3.2

The table shows that Hindi teachers require information for preparing class room lecture only having weighted average of 9.1. If compared to other subjects their need for information is relatively less for other purposes. Its overall weighted average is lecture is 11.2 which is very high in comparison to other needs.

Weighted Average History						
Priority	**WAL**	**WACA**	**WAS**	**WAP**	**WBA**	**WR**
First	7	2.5	0	0.5	0	0
Second	2.8	3.6	0.8	0.8	0.4	0.4
Third	0.3	1.2	1.2	0.9	2.1	1.2
Fourth	0	0.6	2	1	0.4	0.4
Fifth	0	0.1	0.4	0.8	0.4	0.5
Overall	10.1	8	4.4	4	3.3	2.5

The history teachers need information for lecture having weighted average of 10.1. It shows the history teachers require information mostly for preparing lecture for the classroom and also for currrent affairs. The overall weighted average of current affairs is 8.

Weighted Average Math						
Priority	**WAL**	**WACA**	**WAS**	**WAP**	**WBA**	**WR**
First	4.8	1.2	0.2	0.5	0	0.7
Second	1.3	1.7	0.6	1.1	0.2	1
Third	0	1.6	1	1.1	0.3	0.4
Fourth	0.2	0.1	1	0.8	0.4	0.5
Fifth	0	0.1	0.2	0.3	0.3	0.3
Overall	6.3	4.7	3	3.8	1.2	2.9

The analsis shows that the math teachers need information for preparing lecture. The overall weighted average of lecture and current affairs is 6.3 and 4.7.

Weighted Average Physics						
Priority	**WAL**	**WACA**	**WAS**	**WAP**	**WBA**	**WR**
First	3.9	1.1	0	0	1.1	2.2
Second	2.7	1.8	1.3	0.9	0	0.9
Third	0.3	2.3	0.7	1	0	0.3
Fourth	0.2	0.2	1.1	1.6	0.4	0
Fifth	0.1	0.1	0.4	0.4	0.3	0.3
Overall	7.2	5.5	3.5	3.9	1.8	3.7

Physics teachers need information for lecture as well as for current affairs having weighted average of 7.2 and 5.5 respectively. As far as the other needs are concerned they also show a very fair amount requirement.

Weighted Average Political						
Priority	**WAL**	**WACA**	**WAS**	**WAP**	**WBA**	**WR**
First	7.1	2.9	0	0	0	0.7
Second	1.7	3.4	0.6	2.3	0.6	0
Third	0	0	2.1	1.7	2.1	0.4
Fourth	0	1.1	0.9	0.6	0.9	0.9
Fifth	0.1	0.1	0.3	0.4	0.3	0.7
Overall	8.9	7.5	3.9	5	3.9	2.7

The Poltical science teachers is same need of information like of all subject teachers. The overall of both lecture and current affairs is 8.9 and 7.5.

Weighted Average Geography						
Priority	**WAL**	**WACA**	**WAS**	**WAP**	**WBA**	**WR**
First	5	0.7	0	0	0	0
Second	0	2.3	0.6	1.7	0	0
Third	0	0.9	0.4	0.4	0.9	0.9
Fourth	0	0.3	1.1	0	0.3	0.6
Fifth	0.1	0	0.3	0.3	0.1	0.3
Overall	5.1	4.2	2.4	2.4	1.3	1.8

Like the same the Geography teachers are also required information for preparing class room lecture and current affairs.

Weighted Average Other Subject						
Priority	**WAL**	**WACA**	**WAS**	**WAP**	**WBA**	**WR**
First	6	1.5	0	0	0	0
Second	1.2	2.8	0.4	0.8	0	0.8
Third	0	1.2	1.5	1.2	0.3	0.6
Fourth	0	0	1	1.6	0.4	0.2
Fifth	0.1	0.1	0.5	0.1	0.6	0
Overall	7.3	5.6	3.4	3.7	1.3	1.6

The others subjects includes Sanskrit, Psychology Physical Sceince, Sociology and Biology teachers who have need of information for lecture and current affairs. The weighted average is 6.

All above charts shows that the teachers need information for preparing class lecture at the first and secondly for awareness of current knowledge.

Most preferred source used by the teacher is book. But the young teacher used the internet as preferred source. The details of source are as under:

Most Preferred used source							
Priority	Books	Reference	Journal	Magazine	Newspapers	Electronic Media	Internet
First	99	14	4	6	37	5	51
Second	40	36	17	26	49	14	34
Third	25	36	17	56	45	16	19
Fourth	21	31	37	44	40	16	23
Fifth	22	46	31	25	28	21	33
None	8	52	109	58	16	143	55

The above figures shows that out of 215 respondent 99 gives book as first priority source while the internet is second mostly preferred source.

It is analyzed that the teacher's first preferred source is book. All teachers need books in order to extract information. 99 respondents are giving their first priority to the book. Internet is the second priority of the teachers. 51 respondents have given their first priority to the internet. The third priority is given to the newspapers for which there are 37 respondent. Rest of all are relatively less used sources by the teacher.

5. Conclusion

The study reveals that the all teacher need information for preparing class lecture. The second need is awareness of current knowledge. The preferred source is book because the teachers need information for class lecture as books includes information in vast and is mostly and widely available source of information. The second preferred source is internet. In today's modern world internet is becoming a basic requirement for extracting information. Internet makes available each and every information very easily and conveniently. But some teachers are not friendly with electronic media source.

ABBREVIATION

WAL - Weighted average of preparing class lecture.

WACA - Weighted average of awareness of current affairs.

WAS - Weighted average of seminar, conference, workshop, etc.

WAP - Weighted average of preparing a project.

WBA - Weighted average of to write books, articles, etc.

WR - Study material for research Study material for research.

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Information Seeking Patterns of Faculty Members of Karnataka State Open University - *A Case Study*

Gopalswamv. M **Ramesh R Naik**



The present era is the era of information and knowledge revolution. Many Information resources are available abundantly in the library. The increase in information available on the Web has affected information seeking behavior. Innumerable types of information, in a large variety of containers and in many different locations, are all available in one place. In the modern society, the types of information and the media which present them have become manifold and multifarious, offering men and women a vast selection. The concept of information remains vague, it can be perceived as something between data, knowledge which is communicated or received concerning a particular fact of circumstance in order to reduce the user's uncertainty by meeting their needs. To create information awareness and to promote the use of information, it is necessary to know the needs of the users. The present age of information explosion has resulted in an escalating growth of information need of users has become varied and multidimensional. This article reports the result of a study of the Information seeking pattern by the faculty members of KSOU.



Information Seeking, Karnataka state Open University faculty, Electronic environment.

1. Introduction

Information is important to every aspect of today's information society or human being. The process of information acquiring, using and implementing information are generally known as information seeking behavior. In the case of academicians, researchers and students it is even more important because they all need exact and current information for their research need. Regardless of which group in a human society is discussed, each one bases its actions upon current information and discards the earlier data. Philosophies emphasize the direct, experiential acquisition of knowledge in the material, physical plane of existence as the most proper form of information. So, no one can deny that knowledge and information are vital. During 1977 Wilson postulated that people frequently "discover" information in everyday life while monitoring the world for example browsing a magazine or watching television without the direct intention of finding specific information. Researchers' from Library and information science field have begun to focus both on everyday life information seeking and on forms of information behavior that do not involve active or purposeful information seeking on the part of the individual.

Present generation is facing tremendous challenges in applying information high-tech for education purpose. Current education and training facility is in need of proper tools able to overcome limits on the space and time constraints and to meet various performance demands. This trend is clearly identified by the increasing number of geographical distribution of education and training centers. Moreover, continuous updates are required for any technology-related advancement, while most educational users are not aware of modern information Communication technology tools and the integrated use of multiple forms of information, however, requires that the learning effectiveness be enhanced, not hindered.

Users needs vary with the kind of the user. The user's needs are to be satisfied at the earliest possible time. It is the Librarians responsibility to make the user comfortable and then identify his needs by putting some questions. As the work progresses and time passes, users need also changes. First users need should be analyzed and according to their needs sources are to be identified.

2. Need for the Study

Academician or faculty, whatever professional name he or she may be called by is performs one basic function teaching. Teachers of the academic institutions will require information on the subject where they

are teaching. If any faculty wants to be taken seriously by their students and colleagues, they will need to constantly update their private knowledge.

Thus the faculty is required to be up to-date with the subject and its related areas he is teaching. Adding to this, there is also the need for information on various aspects like semester examinations, rights and duties, administration, discussions with colleagues, reference books, and formal articles on the subject on his teaching. Abstracting and Indexing services, attending seminars and conferences and browsing the Internet helps teachers to keep them as updated person.

3. Objectives

- To find out information seeking behavior of the KSOU faculty;
- To know the main purpose of information seeking behavior.
- To find out information sources of consulted by the users mostly

4. Karnataka State Open University: An Introduction

Karnataka State Open University (KSOU) was formally established on June 1, 1996 under the Karnataka State Open University Act of 1992, with the objectives of introducing and promoting the system of open university and distance learning in the state of Karnataka, and coordinating and determining the standard of such a system in the state. The University has its headquarters in Mysore. The university was initiated by the Government of Karnataka. The objective is to provide education to people who cannot attend full time or part time educational courses offered by universities. The distance education programmes of KSOU provide opportunities to working professionals who cannot afford full time education to earn degrees or diplomas. The KSOU originally started as the Institute of Correspondence Course and Continuing Education, a wing of University of Mysore. The KSOU is the 8th Open University to be established in India. Karnataka State Open University is a recognised University of Distance Education Council (DEC), New Delhi, regular member of the Association of Indian Universities (AIU), Delhi, permanent member of Association of Commonwealth Universities (ACU), London, UK, Asian Association of Open Universities (AAOU), Beijing, China, and also has association with Commonwealth of Learning (COL).

5. Methodology

The target populations in the study were faculty members at the KSOU Mysore. A survey method was used for data collection. Study was conducted by collecting opinions through a questionnaire supplied to various faculty of KSOU. A total of 63 faculty members were covered under the study. The data gained from the responses were analyzed to understand target groups information-seeking behavior, information needs and the extent to which these needs have been fulfilled by the university library system and its services. The data was subjected to statistical analysis using Chi-Square non parametric test using SPSS 16.0 package.

6. Data Analysis

Totally 63 faculty members were used for this study and responses were obtained using the set questionnaire. Among these 63 respondents, 37 were males and 26 females. There were 12 professors, 13 Associate professors and 38 Assistant Professors (Fig. 1) among the faculty. Most of the faculty were from Arts department (49); followed by 10 from Science and four from Commerce and Management department (Fig.2).

Fig. 1. Designationwise distribution of faculty respondents

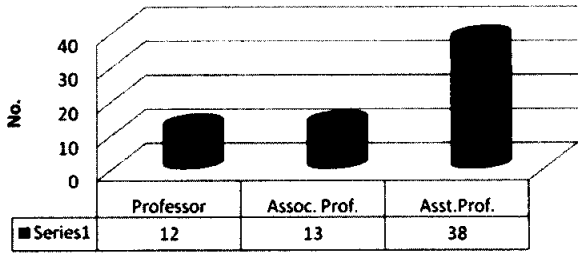
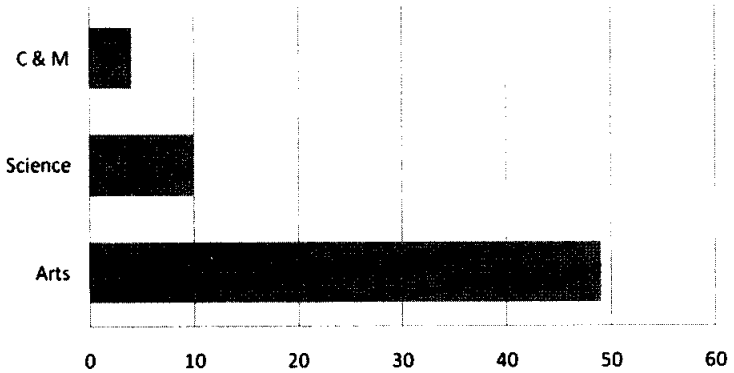


Fig.2. Departmentwise faculty respondents of the study



7. Nature, purpose and type of Information required by the faculty of KSOU :

- **Review of Literature**

Review of literature was required frequently for 59 % of the faculty members followed by occasionally for 25 % faculty members. 10 % of the faculty members required literature rarely and just 4 % opined that literature was required. No faculty members opined that literature was not required. Assistant Professors required (32 %) literature frequently followed by professors and Associate Professors (13 & 14 % respectively). Arts faculty required literature frequently (48 %) compared to science and commerce faculty (6 & 5 % respectively).

Category	Requirement of Review of Literature										
	Not Required	%	Required	%	Rarely required	%	Occasionally required	%	Frequently required	%	Total
Professor		0		0		0	4	6	8	13	12
Assoc. Prof.		0	1	2	1	2	2	3	9	14	13
Asst.Prof.		0	3	5	5	8	10	16	20	32	38
Total		0	4	6	6	10	16	25	37	59	63
Arts		0	1	2	5	8	13	21	30	48	49
Science		0	3	5		0	3	5	4	6	10
C & M		0		0	1	2		0	3	5	4
Total		0	4	6	6	10	16	25	37	59	63

Chi-Square 43.476 Sig. 0.000

- **Theoretical Background Information**

Similar trend as observed for review of literature was observed with theoretical back information requirement by faculty members. Theoretical background Information was required frequently for 57 % of the faculty members followed by occasionally for 30 % faculty members. 5 percent of the faculty members required this rarely and 3 % opined that this is just required. No faculty members opined that Theoretical background Information was not required. Assistant Professors (30 %) required literature frequently followed by professors and Associate Professors (14 & 13 % respectively). Arts faculty required literature frequently (41 %) compared to science and commerce (13 & 3 % respectively) faculty.

Category	Requirement of Theoretical background information										
	Not Required	%	Requ ired	%	Rarely required	%	Occasionally required	%	Frequently required	%	Total
Professor		0	1	2		0	2	3	9	14	12
Assoc. Prof.		0		0		0	5	8	8	13	13
Asst.Prof.		0	2	3	5	8	12	19	19	30	38
Total		0	3	5	5	8	19	30	36	57	63
Arts		0	1	2	4	6	18	29	26	41	49
Science		0	2	3		0		0	8	13	10
C & M		0		0	1	2	1	2	2	3	4
Total		0	3	5	5	8	19	30	36	57	63

Chi-Square 44.365 Sig. 0.000

- **Methods, Processes and Procedures**

Trend of requirement of methods, processes and procedures observed was similar once again. However, in this case, three Assistant Professors in science department did not require this information and only three percent faculty members just required this information. Methods, processes and procedures were required frequently for 44 % of the faculty members followed by occasionally for 29 % faculty members. 19 percent of the faculty members required methods, processes and procedures rarely. Assistant professors (24%) required this information frequently followed by 11 % professors and 10 % Associate Professors. Arts faculty frequently required this information (32 %).

Category	Requirement of Methods, Processes and Procedures										
	Not Required	%	Required	%	Rarely required	%	Occasionally required	%	Frequently required	%	Total
Professor		0	2	3	1	2	2	3	7	11	12
Assoc. Prof.		0		0	2	3	5	8	6	10	13
Asst.Prof.	3	5		0	9	14	11	17	15	24	38
Total	3	5	2	3	12	19	18	29	28	44	63
Arts		0	2	3	11	17	16	25	20	32	49
Science	3	5		0		0	2	3	5	8	10
C & M		0		0	1	2		0	3	5	4
Total	3	5	2	3	12	19	18	29	28	44	63

Chi-Square 37.397 Sig. 0.000

- **Experimental designs, results and applications**

Nearly 40 % of the faculty required this information frequently followed by 27 % of faculty who required this information both occasionally and rarely. 2 % of the faculty just required this information and about 5 % percent of faculty did not require this information. Trend of requirement of this information is almost same under different categories of faculty. Once again Assistant Professors (25%) compared to Professors (8%) and Associate Professors (6%); Arts faculty (22%) compared to other i.e. science (14%) and commerce (3%) faculty required these information frequently higher.

Category	Requirement of experimental designs, results and applications										
	Not Required	%	Required	%	Rarely required	%	Occasionally required	%	Frequently required	%	Total
Professor		0		0	4	6	3	5	5	8	12
Assoc. Prof.		0	1	2	5	8	3	5	4	6	13
Asst.Prof.	3	5		0	8	13	11	17	16	25	38
Total	3	5	1	2	17	27	17	27	25	40	63
Arts	3	5	1	2	15	24	16	25	14	22	49
Science		0		0	1	2		0	9	14	10
C & M		0		0	1	2	1	2	2	3	4
Total	3	5	1	2	17	27	17	27	25	40	63

Chi-Square 33.270 Sig. 0.000

- **Product, Material, Equipment and Apparatus Know-how**

Fifty two percent of faculty required this information frequently followed by 24 % faculty required this information rarely and 16 % faculty members required occasionally. Three percent faculty members just required this information and five percent did not require at all.. Assistant professors (30 %) required this information frequently, where as equally (11%) both Associate Professors and Professors required this information. Arts faculty (38%) once again stands first in requirement of this information compared to science (13%) and commerce (2%).

Category	Requirement of product, material, equipments and apparatus know how information										
	Not Required	%	Required	%	Rarely required	%	Occasionally required	%	Frequently required	%	Total
Professor		0	1	2	2	3	2	3	7	11	12
Assoc. Prof.		0		0	3	5	3	5	7	11	13
Asst.Prof.	3	5	1	2	10	16	5	8	19	30	38
Total	3	5	2	3	15	24	10	16	33	52	63
Arts	3	5	2	3	12	19	8	13	24	38	49
Science		0		0	2	3		0	8	13	10
C & M		0		0	1	2	2	3	1	2	4
Total	3	5	2	3	15	24	10	16	33	52	63

Chi-Square 50.254 Sig. 0.000

- **Information on Previous work done in their field**

This being the most important information required all over the world, most of the faculty members (70 %) required this information frequently. 16 % faculty members required occasionally followed by 11 % who required this rarely and three percent faculty needed this as just required. However, none of the faculty members opined that this is not required. Assistant Professors (40 %) required this information frequently more compared to Professors (14 %) and Associate Professors (16 %). Arts (52 %) faculty required information on previous work compared to science (14 %) and commerce (3 %) field faculty.

Category	Requirement of information about previous works done in their fields										
	Not Required	%	Required	%	Rarely required	%	Occasionally required	%	Frequently required	%	Total
Professor		0		0	1	2	2	3	9	14	12
Assoc. Prof.		0	1	2	1	2	1	2	10	16	13
Asst.Prof.		0	1	2	5	8	7	11	25	40	38
Total		0	2	3	7	11	10	16	44	70	63
Arts		0	2	3	5	8	9	14	33	52	49
Science		0		0	1	2		0	9	14	10
C & M		0		0	1	2	1	2	2	3	4
Total		0	2	3	7	11	10	16	44	70	63

Chi-Square 69.635 Sig. 0.000

- **Current development in the Own Field**

This information was also very highly and frequently required by all faculty members, almost 73 %. Only 13% faculty members required current information rarely; eight percent faculty members required this occasionally and six percent of faculty just required this information. 16 % Professors; 17 % Associate Professors and 40 % Assistant professors; 54 % Arts faculty; 16 % science faculty and 3 % commerce and management faculty frequently required current development in their own field.

Category	Requirement of current development in one's own field									
	Not Required	%	Required	%	Rarely required	%	Occasionally required	%	Frequently required	%	Total
Professor		0	1	2		0	1	2	10	16	12
Assoc. Prof.		0		0	1	2	1	2	11	17	13
Asst.Prof.		0	3	5	7	11	3	5	25	40	38
Total		0	4	6	8	13	5	8	46	73	63
Arts		0	3	5	7	11	5	8	34	54	49
Science		0		0		0		0	10	16	10
C & M		0	1	2	1	2		0	2	3	4
Total		0	4	6	8	13	5	8	46	73	63

Chi-Square 78.016 Sig. 0.000

- **Current Information Sources**

Trend of requirement of this information is similar to trend of requirement of current development in one's own field. 75 % of faculty members required this frequently followed by occasional requirement by 14% faculty; rare requirement by five percent faculty and six percent faculty required just this. Requirement trend of this information under different categories is almost similar to the above. 11 % Professors, 17% Associate Professors and 46 % Assistant Professors required frequently current information sources. Arts faculty (54 %) followed by science (16 %) and commerce (5%) required information on current sources frequently.

Category	Requirement of current information sources									
	Not Required	%	Required	%	Rarely required	%	Occasionally required	%	Frequently required	%	Total
Professor		0		0	1	2	4	6	7	11	12
Assoc. Prof.		0	1	2		0	1	2	11	17	13
Asst.Prof.		0	3	5	2	3	4	6	29	46	38
Total		0	4	6	3	5	9	14	47	75	63
Arts		0	3	5	3	5	9	14	34	54	49
Science		0		0		0		0	10	16	10
C & M		0	1	2		0		0	3	5	4
Total		0	4	6	3	5	9	14	47	75	63

Chi-Square 83.984 Sig. 0.000

- **Management Information**

Compared to above information, management information was not very frequently required by faculty members. Faculty members required this information frequently, occasionally, rarely, just required and not required. 37 percent faculty members required this information frequently followed by 24 % faculty required this occasionally; 25 percent faculty required rarely; five percent faculty required this information just and ten percent did not required this information.

Category	Requirement of management information										
	Not Required	%	Required	%	Rarely required	%	Occasionally required	%	Frequently required	%	Total
Professor	1	2	2	3	2	3	5	8	2	3	12
Assoc. Prof.		0		0	2	3	3	5	8	13	13
Asst.Prof.	5	8	1	2	12	19	7	11	13	21	38
Total	6	10	3	5	16	25	15	24	23	37	63
Arts	4	6	3	5	10	16	12	19	20	32	49
Science	2	3		0	5	8	1	2	2	3	10
C & M		0		0	1	2	2	3	1	2	4
Total	6	10	3	5	16	25	15	24	23	37	63

Chi-Square 20.730 Sig. 0.000

- **Standard and Specifications**

Standard and specifications were required for 43 % faculty frequently followed by 33 % of faculty required this occasionally, 14 % of them rarely. Only 3 percent faculty just required this information and six percent faculty did not require this information. 25 % Assistant Professors, 14 % Associate Professors, 3 % Professors, 30 % Arts faculty and 13 % science faculty required standard and specifications frequently. None of commerce & Management faculty required this information frequently.

Category	Requirement of standard and specifications										
	Not Required	%	Required	%	Rarely required	%	Occasionally required	%	Frequently required	%	Total
Professor		0		0	2	3	8	13	2	3	12
Assoc. Prof.		0	1	2		0	3	5	9	14	13
Asst.Prof.	4	6	1	2	7	11	10	16	16	25	38
Total	4	6	2	3	9	14	21	33	27	43	63
Arts	4	6	2	3	7	11	17	27	19	30	49
Science		0		0	1	2	1	2	8	13	10
C & M		0		0	1	2	3	5		0	4
Total	4	6	2	3	9	14	21	33	27	43	63

Chi-Square 37.873 Sig. 0.000

- **Requirement of Statistical Data**

A large number of faculty members to an extent of 63 % required statistical data frequently followed by occasional requirement by 14 % faculty; rarely by 10 % faculty; and just requirement by 2 % faculty members. 5 % Professors, 17 % Associate Professors, 41 % Assistant professors, 48 % arts faculty, 13 % science faculty and 3 % commerce faculty required statistical data frequently.

Category	Requirement of statistical data										
	Not Required	%	Required	%	Rarely required	%	Occasionally required	%	Frequently required	%	Total
Professor		0		0	4	6	5	8	3	5	12
Assoc. Prof.		0	1	2	1	2		0	11	17	13
Asst.Prof.	3	5		0	5	8	4	6	26	41	38
Total	3	5	1	2	10	16	9	14	40	63	63
Arts	3	5	1	2	8	13	7	11	30	48	49
Science		0		0	1	2	1	2	8	13	10
C & M		0		0	1	2	1	2	2	3	4
Total	3	5	1	2	10	16	9	14	40	63	63

Chi-Square 79.143 Sig. 0.000

- **Information about Procedures**

Forty nine percent faculty members required this information frequently followed by 24 % faculty occasionally required and 21% rarely required this information. Just requirement and non requirement trend is similar to that of requirement of statistical information. Asst Professors (32 %) required this information more than Professors (10 %) and Associate Professors (8 %). Arts faculty also required this information more (35 %0 compared to science and commerce faculty (13 and 2% respectively).

Category	Requirement of information about procedures										
	Not Required	%	Required	%	Rarely required	%	Occasionally required	%	Frequently required	%	Total
Professor		0	1	2	1	2	4	6	6	10	12
Assoc. Prof.		0		0	5	8	3	5	5	8	13
Asst.Prof.	3	5		0	7	11	8	13	20	32	38
Total	3	5	1	2	13	21	15	24	31	49	63
Arts	3	5	1	2	12	19	11	17	22	35	49
Science		0		0		0	2	3	8	13	10
C & M		0		0	1	2	2	3	1	2	4
Total	3	5	1	2	13	21	15	24	31	49	63

Chi-Square 45.333 Sig. 0.000

- **Web Based Resources**

More than fifty percent faculty members required web based resources frequently followed by 29 % of faculty members required occasionally; 14 % required rarely and 5 percent required just this information. None of them opined that web based resources are not required.

Among the three designated faculty, a large number 29 % Assistant professor required web based resources frequently compared to Associate Professors (11%) and Professors (13 %). Requirement of web based resources is the least by commerce faculty (2 %) and Arts faculty (40 %) required frequently and 11 % science faculty were in between.

Category	Requirement of web based resources										
	Not Required	%	Required	%	Rarely Required	%	Occasionally required	%	Frequently required	%	Total
Professor		0		0	3	5	1	2	8	13	12
Assoc. Prof.		0		0		0	6	10	7	11	13
Asst.Prof.		0	3	5	6	10	11	17	18	29	38
Total		0	3	5	9	14	18	29	33	52	63
Arts		0	2	3	7	11	15	24	25	40	49
Science		0		0	1	2	2	3	7	11	10
C & M		0	1	2	1	2	1	2	1	2	4
Total		0	3	5	9	14	18	29	33	52	63

Chi-Square 32.429 Sig. 0.000

- **Healthy and Safety information**

Forty six percent of faculty members required health and safety information frequently followed by 30 % required occasionally; 16 % rarely and three percent faculty just required this information. Five percent faculty did not require this information. 27 % Asst. Professors; 13 % Professors; 6 % Associate Professors; 38 % Arts faculty; 6 % Science faculty and 2 % commerce faculty required health and safety information frequently.

Category	Requirement of health and safety information										
	Not Required	%	Required	%	Rarely Required	%	Occasionally required	%	Frequently required	%	Total
Professor	1	**2**		**0**		**0**	3	**5**	8	**13**	12
Assoc. Prof.	2	**3**	1	**2**	1	**2**	5	**8**	4	**6**	13
Asst.Prof.		**0**	1	**2**	9	**14**	11	**17**	17	**27**	38
Total	3	**5**	2	**3**	10	**16**	19	**30**	29	**46**	63
Arts	2	**3**	2	**3**	8	**13**	13	**21**	24	**38**	49
Science		**0**		**0**		**0**	6	**10**	4	**6**	10
C & M	1	**2**		**0**	2	**3**		**0**	1	**2**	4
Total	3	**5**	2	**3**	10	**16**	19	**30**	29	**46**	63

Chi-Square 41.365 Sig. 0.000

8. Conclusion

From the study it was understood that more than fifty percent faculty required information frequently on current information resources (75%), current development in one's own field (73%), previous work done in their own field (70 %), statistical data (63 %), review of literature (59 %), theoretical background information (57%), web based information (52%), and product material, equipments and apparatus know how information (52 %). Less than fifty percent faculty required information on procedures (49 %), health and safety (46%); methods, processes and procedures (44%), standard and specifications (43%); experimental designs, results and applications (40%) and management (37%), However, when looked into the information requirement of faculty either occasionally or frequently, without any degree, more than fifty percent faculty required all the above information.

There is a need to make a plan for effective or better utilization of KSOU library sources and services. Some suggestions which have been received by the faculty are given here under with planning remedial steps are as: i). need of advance training, ii).use of library sources should be included in research curriculum, iii).need of orientation programmes or periodically training programmes by the library staff, iv). in library handling of technology, computers, network should be developed, v).access of e-resources should be available through WI-FI mode , vi).need to concentrate on proper book shelving and preservation, vii).ILL through document delivery services should be increased, viii).need to examine the possibility future development of library, ix). Need to start digital reference services on KSOU library website, x).there is a need to popularize and improve KSOU Gyanvani FM Educational Channel (105.6 MHz).

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Literature Searching Behaviour and Library Use Pattern of Social Science Community of Tripura University, Tripura: *A Survey*

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The present study was undertaken with a view to know the status of literature searching behavior of social science community of Tripura University, Tripura which comprises of research scholars and staff members. The respondents of the present study are mainly drawn from the various department Tripura University belong to social science. For that purpose, survey method has been adopted by the investigators, which comprises of administration of questionnaire and interview of participants for knowing the status of literature searching pattern of the respondents in respect of library visit, preference of reading materials pertaining to their academic and research activities. The self designed questionnaire has been distributed amongst the randomly selected samples. The samples comprise of faculty members and research scholars. The filled up questionnaires have been collected from the respondents for the data analysis and interpretations. Besides this, some suggestions and recommendations to have also been enumerated for the improvement of library services, Internet facilities and extending user awareness training programme for literature search to maximum utilisation of information resources.



Literature Search, Users Expectation, E- Resource, Tripura University

1. Introduction

Information is the basic material for the decision making process. In the present day, information is considered to be a resource, a product, and thereby a need. But, today everybody is facing a great problem due to information explosion. Due to this information explosion or information pollution the people are confused about the information need, information access and information sources. Again information access varies from person to person according to their needs. Thus, information seeking is a kind of communication behaviour, which may be influenced by many factors, person working environment; his/her wish to resolve the abnormality. [9]

Library plays a vital role in the process of information seeking. Due to resources sharing between the libraries with electronic consortia, the expectation and behavior of library users is also changing day by day. Indeed, for many users of the library, access to networked information resources, rather than physical access, is the preferred method of use in this present scenario. Thus the information seeking behavior is used here to include all activities comparing information seeking, information gathering, retrieving and communication activities performed in the library.

2. Background of the Study

Information is most important for teaching, research and development. The rapid increase in the amount of published information and the effects of this abundance of data leads to rapid growth for information. As the amount of available data grows, the problem of managing the information becomes more difficult, which can lead to information overload. Most of the individuals gain information by means of observation experience and experiments. Studies on information need perhaps one of the most effective methods of understanding the user information requirements. [6]

Today, these libraries are surrounded by networked data that is connected to vast ocean of Internet-based services to make desired information sources accessible to the academic community – students, scholars, staff, and the faculty alike. This study aims to make library users aware of the collection and services of the library. The present study also will project the effectiveness of sources and services of university library of Tripura University, Tripura. The study highlights the adequacy of the collection and services with

other various needs of the library users. The study also examines the effective channels through which information is accessed. The study focuses on the skill of using printed or electronic sources available in the library.

3. Information Seeking Behavior

Information-seeking behaviour involves personal reasons for seeking information, the kinds of information which are being sought, and the way sand sources with which needed information is being sought. Marchionini describes as Information Seeking Behavior as "Information-seeking is a special case of problem solving. It includes recognizing and interpreting the information problem, establishing a plan of search, conducting the search, evaluating the results, and if necessary, iterating through the process again." (Karen E. Fisher, 2005)

At present there are various Information-seeking behaviour models exists, which are Wilson's (1981) model of information--seeking behaviour; Dervin's (1983) sense-making theory; Ellis's (1989 and 1993) behavioural model of information seeking strategies; Kuhlthau's (1991) model of the stages of information-seeking behaviour; and Wilson's (1996) model, which expands his 1981 model through an analysis of the literature in fields other than information science.

4. Objective of the Study

Followings are the main objectives of the present study:

- To understand the literature searching pattern of library users belong to social science community of Tripura University, Tripura;
- To know the nature of information needs of those library users;
- To identify the various channels through which literature is accessed by them;
- To find out the preference of search strategies for literature searching; and
- To suggest various ways and to improve the library facilities and services effectively.

5. Delimitation of the Study

The present study was delimited to library users of social science community of Tripura University, Tripura. The data pertaining to the study were collected through the questionnaires, interview-schedule and personal observation schedule. The socioeconomic status and nature of the library users were not taken into consideration which might have affected the facts.

6. Review of Literature

In order to know the information needs and literature searching pattern, efforts were made to find out the researches completed are related to the present study. A number of works of a reviewing, methodological or theoretical nature on user studies has appeared which are given below:

Sridhar (1995) conducted a study on the user characteristics ranging from internal or external to individual, sociological, demographic, with their various role and status. In this study he also described user productivity, creativity, motivation, interested subject area. Herman (2001) examines the transition to the electronic information era in academia and seeks to establish from the published literature, as to what extent university researchers have accepted, and adapted to the changes wrought in information activity by seemingly endless technological developments. Foster[7] (2004) offers a new, nonlinear model of information-seeking behaviour, which contrasts with earlier stage models of information behavior and represents a potential cornerstone for a shift toward a new perspective for understanding user information behavior. Chiwari and Dick (2008) carried out a study on information needs, information seeking patterns of small,

medium and micro enterprises in Namibia. This study shows small, medium and micro enterprises needs of information on finance, marketing, training, product and business services. Bhattacharjee, Bhattacharjee and Sarmah (2011) has conducted a study attempting to find out the use and familiarity of E-journals through N-LIST consortium to the users of college libraries of Cachar District, Assam. This study also tried to highlight the present position of the college libraries as well as the thinking and satisfaction of the different categories of users like students, teachers and staff. Sinha (2012) conducted a study to know the extent of Internet Literacy among the University Library Users in Assam University library. The results show that the younger generation has accepted the Internet as a means for accessing to the relevant information for academic and research works, whereas the elderly people are still comfortable with traditional resources who are using printed resources available in library, but the volume of frequent usage of e-resources among the users have been found to be at optimum level. Veeranjaneyulu and Lakshmi (2009) conducted a study on the information needs and information seeking behaviour of under-graduate students of S. V. Agricultural college, Tirupati (A.P.). This study shows majority of the student did not satisfy with the library timing and about 89% of them did not visit other library. This study also highlights the requirement of library professionals specially professional who are having the knowledge of agriculture. However, it also highlights the need for collaboration amongst the agricultural library.

7. Research Methodology Adopted

The simple random sampling technique was used to collect the data from the population. The present study includes 150 library users of social science community of Tripura University, Tripura. The questionnaire was distributed the respondents as per the requirement of the objectives of the present study. The questionnaire has been distributed to library users comprise of faculty members and research scholars. The filled up questionnaire has been collected from the respondents for the data analysis and interpretation.

8. Data Interpretation and Important Finding

The data collected were carefully analyzed and processed. The analysis of collected data has been tabulated and in the present report results have been shown in the tabular and graphical format. As the investigators have approached the library users personally, response rate is significantly high.

- **Distribution of Questionnaire to the Respondent and Responses Received**

Altogether 150 questionnaires have been distributed among the library users of social science community of Tripura University, Tripura. Table-1 shows that self designed questionnaire was distributed to 150 respondents. Out of which 134 (89.3%) respondents have returned the filled up questionnaire whereas 16 (10.7%) respondents have not returned the questionnaire. Therefore the response rate is 89.3%, which is a good response.

Table-1: Distribution of Questionnaire and Responses Received (N=150)

Questionnaire	No. of Respondents	Percentage (%)
Questionnaire Received	134	89.3
Response Not received	16	10.7
Total Distributed	**150**	**100**

(Source: Primary Data)

- **Sex-Wise Distribution of Respondents**

From the Table -2, it is evident that out of 134 respondents, 90 (67.2%) of respondents are male whereas 44 (32.8%) respondents are female which shows that in the present study male respondents have participated in more number than that of its female counterpart.

Table -2: Gender- wise Distribution of College Library Users (N= 134)

Gender	Number of Respondent	Percentage (%)
Male	90	67.2
Female	44	32.8
Total	134	100.0

(Source: Primary Data)

- **Age-Wise Distribution of Respondents/ College Library Users**

Survey result as indicated in Table-3 shows the age-wise distribution of 134 respondents/ library users which reveals that 62 (46.2%) respondents belong to 26-35 years age group which is followed by 35 (26.1%) respondents who belong to 36-50 years age group, whereas 24 (19.7%) respondents belong to 16-25years age group and 13 (9.8%) respondents belong to 51-Above years age group. The survey findings suggested that more number of young generations have actively participated in the present survey.

Table -3: Age- Wise Distribution of Respondents / College Library Users (N= 134)

Age Group	No. of Respondents	Percent (%)
16-25	24	17.9
26-35	62	46.2
36-50	35	26.1
51- Above	13	9.8
Total	134	**100.0**

(Source: Primary Data)

- **Category Wise Distribution of College Library Users**

Table- 4 shows that out of 134 respondents, 86 (64.2%) belong to research scholars, whereas 48 (35.8%) respondents are faculty members. The survey findings suggested that more number of research scholar have participated in the present survey.

Table -4: Category- Wise Distribution of College Library Users (N= 134)

Type	No. of Respondents	Percentage (%)
Faculty	48	35.8
Research Scholar	86	64.2
Total	134	**100.0**

(Source: Primary Data)

- **Library Visit Pattern of College Library Users**

The frequency of library visits by library users are shown in the Table -5 which shows the library visits pattern of the college library users which indicates that the most of the respondents 78 (58.2%) visit library on daily basis which is followed by 34 (25.3%) respondents who visit library on weekly basis whereas 10 (7.4%) do not visit library on regular basis and 12 (8.9%) respondents visit library irregularly.

Table-5: Library Visit Pattern of College Library Users (N= 134)

Library Visit Pattern	No. of Respondents	Percent (%)
Daily	78	58.2
Weekly	34	25.3
Monthly	10	7.4
Not Regularly/ Often	12	8.9
Total	**134**	**100.0**

(Source: Primary Data)

- **Ranking of Purpose of Library Visit**

The library users used to visit university libraries or other public/ academic/ special libraries to meet their different academic information needs. They mainly depend on the resources available in their college libraries for their teaching- learning, preparation of notes, assignments, lecture, project reports, to keep themselves up-to-date in the areas of current affairs for the competitive examinations, and also for spending leisure hours by going through light reading materials like newsmagazines, newspapers, fictions etc. The respondents were asked to rank the option into 1-5 scale and multiple responses were allowed.

Table-6: Ranking of Purpose of Seeking Information by Respondents (N= 134 each)

Purpose of library Visit	Frequency (Percent)	Rank
To search information of the research related topic.	67 (50.0%)	1
To keep up-to-date on the area/ subject of interests.	53 (39.5%)	2
Reading materials like newspaper/ newsmagazines etc.	44 (32.8%)	3
To find out earlier submitted thesis/ dissertation.	42 (31.4%)	4
Preparing for assignment/ lecture/ competitive Examinations.	30 (22.3%)	5
Others	24 (17.9%)	6

(Source: Primary Data)
(Respondents are allowed for giving multiple responses)

The survey results as shown in Table-6 shows that the majority of the respondent 67 (50.0%) visit the library to search information of the research related topic and placed at 1st rank which is followed by 53 (39.5%)to keep up-to-date on the area/ subject of interests and placed at the 2nd rank whereas 44 (32.8%) for reading materials like newspaper/ newsmagazines etc. is placed at 3rd Rank; 42 (31.4%) to find out earlier submitted thesis/ dissertation is placed at 4th rank and 30 (22.3%) to prepare for assignment/ lecture/ competitive examinations placed at 5th rank respectively. Further 24 (17.9%) respondents' feels there are some other the purposes for information seeking along with those main purposes. Therefore it is evident that maximum number of library users visit the college and other libraries to keep themselves up-to-date in the areas / subject of interest whereas purpose for visiting libraries for reading newspapers, magazines, entertainment and spending leisure hours has been given less importance by the respondents.

- **Search Strategies Adopted by the Respondents for Seeking Desired Information**

Library users adopt various strategies to search desired information for his academic/ research assignments. Thus strategies are Internet access, access online resources, consult with teacher, takes help from library staff, discuss with colleagues, manual library catalogue search and through OPAC search. The respondents are asked to rank the various search strategies for searching/ seeking desired information for their day to day requirements. The respondents are asked to rank all the search strategies as per their importance for their literature searching pattern. Majority respondents search literature by directly accessing documents from shelve 72 (53.7%) and placed at 1st rank which is followed by taking help from library staff /teacher 54 (40.3%) placed at the 2nd rank, whereas by using manual library catalogue 50 (37.3%) is placed at the 3rd rank, OPAC 45 (33.8%) and by accessing online/ Internet search 40 (29.6%) are placed at 4th and 5th rank respectively.

Table -7: Search Strategies Adopted by the Respondents for Seeking Desired Information (N= 134 Each)

Search Strategies Adopted by the Respondents	Frequency (%)	Rank
By searching documents from shelve	72 (53.7%)	1
Takes help from library staff /teacher	54 (40.3%)	2
Manual Library Catalogue	50 (37.3%)	3
OPAC	45 (33.8%)	4
Access online / Internet Search	40 (29.6%)	5
Others resources	36 (26.8%)	6

(Source: Primary Data)
(Respondents are allowed for giving multiple responses)

Further 36 (26.8%) respondents generally used some other search pattern along with these searching patterns. Therefore from Table-7, it has been observed that search literature by directly from shelve is the most popular literature searching behavior of the library.

- **Preference of Library Resources / Necessity for Teaching- Learning Process**

A good collection of documents is the base of each library. The collection of the library plays an important role in the academic institutions. If the library collection is quantitatively adequate and qualitatively meaningful, then the research/teaching needs are fulfilled. The Table-8 reveals that the out of 134 respondents 66 (49.2%) preferred text books, which is placed at 1st rank which is followed by scholarly journals 58 (43.2%) which is placed at the 2nd rank whereas theses/ dissertation 53 (39.5%), e-resources 52 (38.8%), newspaper 47 (35.7%) is placed at the 3rd rank, 4th rank and at the 5th rank respectively. Online resources 29 (21.6%), reference books 24 (17.8%), abstracts & indexes 22 (16.4%) CD/ DVD databases 19 (14.1%) is placed at 6th , 7th 8th and 9th rank respectively whereas government reports 12 (8.9%) has been placed at the 10th rank order and some other 9 (6.7%) respondents also use other resources along with those materials.

Table -8: Ranking of the preferred of reading materials/ resources (N= 134 each)

Preference of Reading Materials	Frequency (%)	Rank
Text books	**66 (49.2%)**	**1**
Scholarly Journals	58 (43.2%)	2
Theses/ Dissertation	53 (39.5%)	3
E-Resources	52 (38.8%)	4
Newspaper	47 (35.7%)	5
Online Resources	29 (21.6%)	6
Reference books	24 (17.8%)	7
Abstracts & Indexes	22 (16.4%)	8
CD/ DVD Databases	19 (14.1%)	9
Govt Reports	12 (8.9%)	10
Others	9 (6.7%)	11

(Source: Primary Data)
(Respondents are allowed for giving multiple responses)

It is clear that text books, scholarly journals, theses/ dissertation are preferred by majority of the users and hence they are in the upper hand. Therefore it may be concluded that textbooks, journal and thesis/ dissertation are playing an important role as preferred information sources.

- **Suggestion for Better Use of Library Services by College Library Users**

To improve to library services or to overcome difficulties, suggestions were invited from the respondents. For each suggestion the respondents were asked to rank their opinion from 1 to 5 ranks as per their perception.

Table -9: Suggestion Improve Library Services and Usage (N=134 each)

Suggestions	Frequency (%)	Rank
Develop Adequate Collection of Reading Materials	**72 (53.8%)**	**1**
Organised training program for using Unicode	69 (51.4%)	2
Organised training program for E-resources/ Internet	61 (45.5%)	3
Ensure Regular Power Supply/ UPS Backup	53 (39.5 %)	4
To Start CAS and SDI service	44 (32.8 %)	5
Others	38 (28.3%)	6

(Source: Primary Data)
(Respondents are allowed for giving multiple responses)

The suggestions put forwarded by the respondents with ranks have been tabulated and shown in Table-9, which reveals that the majority of the respondents 72 (53.8%) suggest to develop adequate collection of reading materials including e-resources and change in collection development policy, and placed at 1st rank which is followed by organizing training program for using Unicode 69 (51.4%) and placed at the 2nd rank whereas e-resources/ Internet training program 61 (45.5%), regular power supply 53 (39.5 %) and to provide CAS and SDI service 44 (32.8 %) are placed at the 3rd, 4th and 5th rank respectively. There are 38 (28.3%) respondents also provides other suggestion such as to provide terminal to each departments, better usage of e-consortia services, etc. Therefore, the suggestions put forwarded by the respondents reflect that to improved library services, library has to make necessary changes in collection development policy to develop good collection of college libraries, and to organized training program specially for Unicode for using the Internet and access to e-resources.

9. Suggestions and Recommendations

From the present study it is clear that library users are not satisfied with the services provided by the college library. They are facing various kinds of problems. In order to retrieve desired information by the users, the information intermediary has to adopt inter alia certain behavioral strategies to make the system effective. The followings are few suggestions and recommendations to meet the user's expectations which are based on the present study and suggestions given by the respondents:

- Library should develop adequate library collection keeping in view the information needs of the college library users. Proper rules and regulation and policies should be framed and implemented for adequate collection developments;
- Create awareness among the library users regarding the types of sources, Unicode, their importance and usefulness for getting the information;
- Use of non-book materials, CD-ROMs databases for bibliographical searches should be encouraged and improved;
- There is an urgent need to training program for using e-resource;
- Library should also provide awareness program regarding e-consortium services providing by library;

- ICT trained and skilled library professionals / staff should be recruited for the betterment of the library services. More computers/Terminals with latest configurations should be made available in the library so that the users can use Internet, e-resources and e-journals and other useful services of the Internet effectively;
- To maintain their interest towards e-resources the library must ensure adequate and continuous uninterrupted power supply; and
- More funds should be given to acquire electronic resources and also to pursue printed documents.

10. Conclusion

Information need occurs when ever people find themselves in situations that required some form of knowledge for resolution. Information has been embedded in present ICT environment in variety of forms in various kinds new trends and technologies. From the study it is evident that the majority of library users visit library on daily basis. Majority of them also visit library to search information of the research related topic and also to keep them up-to-date on the subject of interest. Information seeking and gathering could be a challenging task to the library users as most of the library has limited resources. Text book, reference book and thesis are the major sources of information resource in the library of Tripura University, Tripura. The text books or reference books are old collection and most of such material does not meet with their expectation. Many users are suggesting to subscribe more online journals and e-resources of various publishers. A rapid change in literature searching behaviour and use of Internet for online access of e-resources have become the vital part of various information needs. Lack of training among library users is one of the vital factors in the usage of Internet, e-resouces and e-journals in Tripura University, Tripura.

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Management and Utility of E-Resources in Tagore Central Library of the University of Lucknow: *A Case Study*

Sumit Ranjan **Ranjeet Kumar Choudhary**

Abstract

The study investigated awareness, perception, and interest in e-resources and digital resources of students of University of Lucknow. The study also identified the difficulties faced by respondents while using the digital resources. The study shows that 52% of respondents were aware of E-resources but they never use. The main purpose of using E-resources is for education responded by 60% of respondents. 74% of respondents opined that Boolean searching technique is favorite most of them. Only 8% of respondents were fully satisfied with E-resources facilities. Low interest and unawareness of using e-resources are major problems found in this study. Based on the findings, the study suggests: should provide proper IT awareness for students, should provide training for staff, should provide sufficient infrastructure. This study would suggest library administration to make an environment for E-resources.

E-Resources, Digital Library, University of Lucknow, Digitization

1. Introduction

The worldwide hunger for access to knowledge results into information explosion. In our socio-technical culture, technological developments have led to a rather tremendous rate of creation and dissemination of digital information. Technology has enabled the digitization of documents, text, sounds, and images in such a way that the information, not necessarily the knowledge, is available virtually anytime, anywhere via internet-connected devices.

The e-resources is a seamless blend of the conventional archive of current or historically important information and knowledge, along with ephemeral material such as drafts, notes, memoranda and files of on-going activity. An "electronic resource" is defined as any work encoded and made available for access through the use of a computer. It includes electronic data available by, remote access and, direct access. In other words: Remote access (electronic resources) refers to the use of electronic resources via computer networks. The electronic content may be stored locally, or accessed remotely via computer networks. Digital collections of Internet resources place important information close at hand. They facilitate the dissemination of new research faster, and create access for wider audiences. They pose interesting problems for design because of the large amounts of information involved and the difficulty of determining just what users wish to do with such systems.

University of Lucknow is situated in the city of Lucknow, Uttar Pradesh, India. It is affiliated to University Grants Commission (UGC); Association of Commonwealth Universities (ACU); Association of Indian Universities (AIU); Distance Education Council (DEC). University of Lucknow was established in law by the Governor General on November 25, 1920. It is one of the largest universities in India with over 101 affiliated colleges and over 100,000 students. It has 7 faculties, 9 institutes and centres.

2. Objectives:

- Assess the awareness about e-resources among the students;
- Find out the satisfaction level of students from e-resources;
- To know the purpose, kinds of material, accessed through e-resources; and
- To examine the hurdles in the way of E-resources.

3. Methodology

To collect data, a questionnaire was designed with questions like computer skills, frequency of use, purpose of use, problems in use, satisfaction with e-resources, performance of library in the satisfaction of UG and PG students and Research Scholars. These questionnaires are distributed personally to the students and Research Scholars of University of Lucknow. The collected data is then analysed systematically.

4. Results and Discussions

The study population, consist students from different departments of students and Research Scholars. Table 1 gives detailed information about the distribution of questionnaire respondents.

- **General Information:** The total no. of questionnaire distributed is 100. Total no. of questionnaire received back is 100, so the responding percentage is 100%. Out of these 100 respondents, 40 were female and 60 were male. Figure 1 shows number of male and female respondents.

Table 1

Sr. No.	Gender	Research scholar	Pg students	Ug students
1	MALE	20 (72%)	28 (58%)	12 (50%)
2	FEMALE	8 (28%)	20 (42%)	12 (50%)
	TOTAL	28 (100%)	48 (100%)	24 (100%)

- **Awareness of E-resources and use:** Table 2 shows the percentage of awareness of e-resources among students and Research Scholars. 52 % of respondents were aware about e-resources but they never use it, 24 % were aware of e-resources and also using it and remaining 24 % were not aware of E-resources. Out of 28 research scholars 64% were aware but never use e-resources, out of 48 PG students 25% were aware and use e-resources and out of 24 UG students 50% were unaware about e-resources.

Table 2

Sr. No.	Response	Research scholar	Pg students	Ug students
1	Aware and use	6 (22%)	12 (25%)	4 (17%)
2	Aware but never use	18 (64%)	26 (54%)	8 (33%)
3	Not aware	4 (14%)	10 (21%)	12 (50%)
	Total	28 (100%)	48 (100%)	24 (100%)

- **Frequency of library visit:** Table no. 3 presents the frequency for visiting library by the students and Research Scholars. Out of 100 respondents 28 were research scholar, 48 were PG students and remaining 24 were UG students.

Table 3

Sr. No.	Frequency	Research scholar	Pg students	Ug students
1	DAILY	14 (50%)	4 (8%)	0(0%)
2	2 OR 3 IN A WEEK	4 (14%)	22 (46%)	8 (34%)
3	ONCE IN A MONTH	8 (29%)	8 (17%)	14 (58%)
4	OCCASIONALLY	2 (7%)	14 (29%)	2 (8%)
	TOTAL	28 (100%)	48 (100%)	24 (100%)

- **Purpose of using e-resources:** Table no. 4 presents the purpose of using e-resources by research scholar, PG students and UG students and Research Scholars. Out of 28 research scholars 64% were

using e-resources for research purpose. 79% of PG and 84% of UG students were using e-resources for their education purpose.

Table 4

Sr. No.	Purpose	Research scholar	Pg students	Ug students
1	Research	18 (64%)	4 (8%)	2(8%)
2	Education	6 (22%)	38 (79%)	20 (84%)
3	Any other	0 (00%)	0 (00%)	0 (00%)
4	Unaware about E-resources	4 (14%)	6 (13%)	2 (8%)
	Total	28 (100%)	48 (100%)	24 (100%)

- **Search any online catalogue:** This study shows that how many respondents were ever used online catalogue. Table no. 5 shows that 64% research scholar, 20 % post graduate students and 4% under graduate students were used online catalogue. Pie chart 1 shows that 56% of respondents never used online catalogue.

Table 5

Sr. No.	Response	Research scholar	Pg students	Ug students
1	YES	18 (64%)	20 (42%)	4 (17%)
2	NO	10 (36%)	28 (58%)	20 (83%)
	TOTAL	28 (100%)	48 (100%)	24 (100%)

- **E-resources access points:** 20% of respondents were accessing e-resources on their mobile, 42% were on their PC's and laptops and remaining were at cyber café and on library computer. Research scholars and UG students mainly using their mobile for accessing e-materials as shown in table no. 6.

Table 6

Sr. No.	Access point	Research scholar	Pg students	Ug students
1	Mobile	10 (35%)	6 (13%)	12(50%)
2	Pc's/ laptops	8 (29%)	18 (37%)	6 (25%)
3	Cyber café	2 (7%)	14 (29%)	6 (25%)
4	Library computer	8 (29%)	10 (21%)	0 (00%)
	Total	28 (100%)	48 (100%)	24 (100%)

- **Priority for digitization:** As we can see in table no. 7, books are the first choice for digitization, 50% were thinks that book should be first to digitize, 38% were in support of journals. Majority of research scholars were in favour of journals 72%. Under graduate students were in full support for books to be digitized first.

Table 7

Sr. No.	Material	Research scholar	Pg students	Ug students
1	Books	4 (14%)	22 (46%)	24 (100%)
2	Journals	20 (72%)	14 (29%)	0 (00%)
3	Thesis	4 (14%)	10 (21%)	0 (00%)
4	Any other	0 (00%)	2 (4%)	0 (00%)
	Total	28 (100%)	48 (100%)	24 (100%)

- **Standard of work suffer without e-resources:** Table no. 8 gives descriptions of respondents about the presence of e-resources. Out of total respondents 34% responder's feel that the absence of e-resources will affect on their work and 36% were doesn't know about this. 50% of research scholars disagree with the statement, only 42% UG students were agree with this statement.

Table 8

Sr. No.	Response	Research scholar	Pg students	Ug students
1	AGREE	6 (21%)	18 (38%)	10(42%)
2	DISAGREE	14 (50%)	8 (17%)	6 (25%)
3	DON'T KNOW	8 (29%)	22 (45%)	8 (33%)
	TOTAL	**28 (100%)**	**48 (100%)**	**24 (100%)**

- **Problems while using digital resources:** Table no. 9 presents difficulties facing by respondents. 36% research scholar were not familiar with digital resources, 38% PG students were not able to use digital resources properly and 67% UG respondents were think that material they need are not available. Out of total respondent 26% were not able to use digital resources properly.

Table 9

sr. no.	reasons	research scholar	pg students	ug students
1	Not sufficiently familiar with digital resources.	10 (36%)	6 (12%)	2(8%)
2	Not able to use digital resources properly	8 (29%)	18 (38%)	4 (17%)
3	Material I need is not in use or not available	2 (7%)	8 (16%)	16 (67%)
4	Some doubt about the permanence of the material	6 (21%)	14 (30%)	2 (8%)
5	Difficult to read from the screen	2 (7%)	2 (4%)	0 (00%)
	TOTAL	**28 (100%)**	**48 (100%)**	**24 100%)**

- **Satisfaction with e-resources:** table no. 10 shows that 42% research scholars are fully satisfied while 42% of PG students were least satisfied with e-resources. 50% UG students give no response on this question. Out of total respondents 34% were least satisfied.

Table 9

Sr. No.	satisfaction level	research scholar	pg students	ug students
1	Fully	12 (42%)	4 (8%)	4 (17%)
2	Partially	8 (29%)	18 (38%)	2 (8%)
3	Least satisfied	8 (29%)	20 (42%)	6 (25%)
4	No comment	0 (00%)	6 (12%)	12 (50%)
	TOTAL	**28 (100%)**	**48 (100%)**	**24 (100%)**

5. **Major Findings of the Study:** The major findings of this study are:

- 52% of respondents aware about e-resources but they never use, 64% of research scholar were aware but never use e-resources.
- 44% of respondents were learns computer through computer course, only 8% were learn from training from library.
- Research scholars were most frequent in library visit. Most UG students were visit library once in a month.
- Research scholars use e-resources for their research purpose. PG and UG students using it for their education and assignment purpose.
- Majority of 56% respondents never search any online catalogue. Out of total UG students only 17% uses any online catalogue.

- Books should be digitised first for which majority (50%) of respondents are in favour. But 72% of research scholars are in the favour of journals.
- 48% were used catalogue for searching instead of OPAC.
- Most of the respondents were accessing e-resources on their laptops and PC's. 50% of UG students and 35% of research scholar were using mobile for accessing e-resources.
- It was observed that only 34% respondents were feeling that e-resources is important to improve their work standard. But 50% research scholars were disagreeing with this statement.
- Only 8% of respondents were fully satisfied with e-resources out of majority is of research scholar with 42%.
- University of lucknow library have rich collection of e-journals.

6. **Suggestions:** Based on the findings, following suggestions should be made for further improvement:

- The first thing I want to suggest through this study that there should be an awareness programme for students so that they should aware of E-resources.
- Adequate training should be provided for students, so they became familiar with e-resources.
- Library should provide basic facilities to users and training programme.
- The library staff should also be well qualified to fulfil users need.
- Library should make an environment suitable for e-resources and seek attention of users.
- The university should also some work to do, they should add IT topics in syllabus, so that students should have basic knowledge.
- The study shows that maximum respondent's doesn't find the material they needed because they are not available, so university library should have knowledge of students information need and according to that they should provide those e-resources.
- Library timing should be extended, for the convenience of users it may be opened 24x7.
- Collection of E-resources should be increased.

7. Conclusion

The study examined the utility of E-resources in the University of Lucknow. The respondents were research scholars, Post graduate students and Under graduate students. Looking at the findings of this study it can be said that students were not prepared to use digital resources. Most of them were unaware of e-resources and digital resources. They have low interest in digital materials. Most of them were not regular in library mostly UG students. Library should have sufficient infrastructure and knowledge of users need. The present study clearly shows the clear picture on various factors associated with the use of e-resources of central research library of University of Lucknow.

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Management of E-Resources in Academic Libraries

Raghvendra Tripathi

Abstract

The Library and information Services in new era are very fast going and challanging. In most of Academic Libraries these services are not bounding in any walls but these are scattered in to local, Regional , National and Even International Networks by the rapid development of Electronic publishing materials such as printed books and journals, but also arrenging for providing for access to various learning resources in Electronic form. This paper describe reflects paradigm shift of academic libraries in E-Resources era. The need for E-Resources to Users are growing and becoming very important. This paper also discusses the role of Library professionals in collection development, definitions of E-Resources, Advanted, type of E-Resources and Management.

E-Resources, Technology, Management, Digital Collection, Management issues, Role of Library

1. Introduction

An electronic resource is any information source that the library provides access to in an electronic format. The library has purchased subscription to many electronic information resources in order to provide you with access to them free of charge. Our E-Resources include lots of things : Full-text journal, newspapers, company information, e-books, dictionaries, encyclopedias, economic data, digital images, industry profiles, market research, career information, etc. Electronic resource management (ERM) is the practices software systems used by libraries to keep track of important information about electronic information resources, especially internet-based resources such as electronic journals, databases, and electronic books.

The development of ERM became necessary in the early 2000s as it became clear that traditional library catalogs and integrated library systems were not designed to handle metadata for resources as mutable as many online pro the idea of development electronic resource management systems emerged in 2001-2002, growing out of research by Tim Jewell at the University of Washington. The Digital Library Federation and NISO began work in May 2002 to develop standards for ERM data. These standards were published in the 2004 as Electronic Resource Management.

2. Need and Purpose of E-resources:

The main purpose of using e-resources is to improve the efficiency of library, to render services to end users, and to provide effective information services to faculty, research scholars and achieving their goals, the transition of research articles, books and journal has compelled to use latest technologies in libraries.

E-resources have become one of the most important aspects of a digital library, which change the formal of document from a typed paper to electronic form. E-resources play a vital role in creation and dissemination of knowledge. In a relatively short period, e-resources have expanded from a few dozen computerized database bibiliographies to the overwhelming information available on the internet. E-resources have moved from accessing on line databases with a dumb terminal to surfing the www.

3. Advantages of E-Resources

- Electronic journals demand neither library space nor can they be stolen from the library.
- Optimum utilization of funds.
- Consortia-based subscription to electronic resources provides access to electronic provides access to wide number of electronic resources at substantially lower cost.

- Helpful to provide better library services like CAS and SDI.
- Facilities to build up digital library.
- Available 24 hours a day, seven days a week.
- The consortium have been offered better terms of licenses for use, archival access and preservation of subscribed electronic resources, which would not have been possible for any single institution.

4. Needs of E-Resources

- Electronic documents need to supports parallel supports and electronic method of knowledge disseminating.
- Application of academic activities such as syllabus, teaching and learning.
- Increasing Interdisciplinary research.
- Increasing the cost of publication.
- Easy to access.
- Speedily accessed.
- Some publication only published electronic forms.
- It can be read any where in the world.
- No, necessity of space, shelving cost.
- Increasing tendency to use e-information sources in academic libraries.

5. Types of E-Resources

- **E-Journals:** This is the most widely used digital resource. Hundreds and thousands of e-journals are made available by the commercial agencies, academic institutions and the agencies promoting open access initiative. Simple and advanced search facility is the most useful feature of the e-journals. The whole contents of the journal including the back files could be search for any topic.They are available instantly and could be browsed in the 24X7 modality. High subscription rates is the most critical issue related with the e-journals made available by the private agencies such as publishers and aggregators. So also the packages offered by them may not be very convenient to the libraries. Library professionals must negotiate intelligently the licensing terms and condition. They should also be able to select price models suitable to them.
- **E-Book:** An E-Book is an electronic version of a traditional print book that can be read by using a personal computer or by using an E-book reader. Users can purchase an E-book on diskette or CD, but the most popular method of getting an E-book is to purchase a download file of the E-book (or other reading material) from a websites to be read from the users computer or reading device. Generally E-book can be download in five minutes or less.
- **E-Databases:** Today there are number of databases available on the network they are either free or with charges. E-database is an organized collection of information is of a particular subject or multidisciplinary subject areas, information sources within e-database can be searched and retrieved electronically. The network information sources locally informed database regional or state wise consortia, aggraded database, web resources.
- **CD ROM/DVD ROM:** Electronic information resources in CD format include abstracting and indexing services, encyclopedias, dictionaries, year books, back volumes and many other references works. It

is use for store large amount of structured data, bibiliographic information full text information and images. Digital video disc with high data storage capacity has made it possible to include more multimedia elements like video and sound and to integrate many reference sources on a single disc.

- **E-thesis and dissertations:** Theses are one of the primary documents made available in limited copies to universities and reach institutions where the researcher has carried out his research work. However, the academic world believes that the theses should be made available for further researchers easily. The digital technology has proved very beneficial for the preservation of theses. Institutions like vidyanidhi and INFLIBNET are making available theses in the digital formal over the internet.

6. E-Resources Management at the Academic Libraries

The development of information technology and the dissemination of web environments have a dramatic effect on the user behaviours in information usage. The library user requests swifter and more convenient usage of information beyond the time and space barriers, which charges the library atmosphere. The workflows from acquisitions to user services and the life cycle of electronic resources is quite different from that of print resources since it is characterized by access without holding the physical objects.

- **Digital collection:** A set of electronic documents or other resources presented as a purposeful assemblage, e.g., organized and presented according to library or archival principles; or representing the digital "holdings" of an institution.
- **Mixed / Composite Resource Type Databases:** Information organized as or stored in a database, e.g., with structured cross-document search and retrieval, relational data structures efficient query mechanisms.
- **Individual Document Resource Types**
  - **Text Based Document Types:** Biography, Conference proceedings, Dictionary, Electronic Journal, Electronic Newspaper, Electronic Newswire, Electronic Book, Electronic Text, Encyclopedia, Exhibition, Numerical data, Statistical data.
  - **Non-Text Based Document Types:** Animation, Audio file, Digital image, Video file, Multimedia etc.
  - **Meta Resource Types:** Abstracts, Archival finding aid, Bibliography, Catalog, Index etc.

7. ERMSS: Internet / Electronic Resources Management & Search Solutions

ERMSS is a customized solution to manage & provide search on Physical Resources, subscribed e-resources of the library, Digital Resources of the Library and the Open Access Contents available on the Internet. This is an effective management & search tool for information seekers like researchers, library members, student's etc. One can access single or all the resources / contents in the same interface by using various search parameters. To summarize this is a single search solution to search on all e-resources of Library. ERM as a Service enables libraries to:

- Manage licenses and evaluate acquired content based on configurable reporting.
- Provide browsing, searching, and full text access capabilities to your end users.
- Calculate and analyze the cost per use of electronic journals quickly and efficiently.
- Offer access to over 15,000 full text e-journals.
- Retain tight control of all acquisition and authentication options.

  Search through over 32 million articles and references.

8. Electronic Resource Management

Libraries can use Electronic Resource Management as a stand-alone solution or an integrated module of the Millennium ILS. As a stand-alone system, libraries can enjoy the benefits of ERM's ability to maintain resources, track licenses For libraries wanting a complete software and content solutio, Innovative offers the Content Access Service (CASE). CASE populates the coverage database with extensive information about the e-resources you've chosen for your community, marking the Innovative ERM the most comprehensive and flexible product of its kind.

The E-resource Management Systems (ERMS) are tools that impact libraries at multiple levels. Consider the patron and staff experience, the ability to support research curate the outputs of academic community while marking collections accessible, and the library's ability to "do business" effectively.

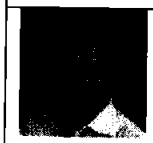
9. Conclusion

Preservation of digital resources requires a long term strategy and appropriate technology adoption. The twenty first century is still confronting with the problem of universally accepted technology for preserving our digital heritage but institutions World over are seeking out the best paths to long-term preservation of digital resources. The responsibility of digital preserving in a combination of number of stake holders like creators, libraries, publishers, Distributors , Archive centers, IT suppliers, Legal Depositors.

Libraries should take measures for ensuring the safely, longevity and accessibility of collections and should be least dependent on vendors and external services providers. Concerted efforts should be taken to enact legal deposit law which would go a long way in preserving digital content of the resources. Time seems right for Indian libraries to explore various options to create models for digital preservations of the electronic resources subscribed by them. Various Consortia of the country-INDEST, INFLIBNET should intiate digital preservation projects which may be model on LOCKS and CLOCKSS. The consortia may negotiate with publishers to set up local server in order to meet the needs to Indian libraries.

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Managing Electronic Resources through Library Consortia

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Rajeshwar Kumar, G



Libraries are the knowledge houses and are changing according to the needs of their patrons. Previously only printed resources were the part of libraries but now the e-resources are predominant, since the trend is of e-publishing information. Consortia efforts have become an important force in the information world. Academic Librarianship is in the process of being rapidly transformed in the sense of preserving information. This paper mainly focuses on e-resources, library consortia and how to manage the e-resources in libraries through consortia.



E-Resources, Library Consortia, E-Journals, Copyright

1. Introduction

The library and information services of the 21st century are fast changing with the rapid development of electronic publishing; libraries are not only acquiring reading materials such as printed books and journals but also arranging for providing access to various learning resources in electronic form. In the new situation, the role of library professionals in collection development and management has become restricted. In fact, they are now playing the new role of access manager of e-resources rather than acquisition manager and custodian of scholarly resources in print form. In academic libraries, the main attraction of the researchers is articles of learned journals and chapter of advanced treatises. Most of the scholarly resources are now available only in electronic form. Most of the electronic journals (e-journals) are now providing a lot of useful linking facilities where in citations are linked to their full text or at least abstract of the cited documents.

2. E-Resource

Electronic resources can be defined as resources that include both document and non-documents in electronic or e-format that provide information or a link to the information. Electronic resources are those electronic products that deliver the collection of information in electronic format. According to LC, Collections Policy Statements: Electronic Resources, 1999: 'Electronic resources' is defined "as any work encoded and made available for access through the use of a computer" based device.

The library has undergone drastic change in terms of collections and services. The proliferation of e-resources has had a significant impact on the way academic community uses stores and preserves information. The advantages of e-resources have drawn attention of the library users to a great extent. Accordingly, these resources have occupied a significant place in the collection and budget of almost all libraries. Student's attitudes seem to be very positive towards e-resources for their study and research and the role of the libraries as gateway to provide assistance in accessing these resources. Due to emergence of many local, regional , national and International resource sharing knowledge network initiatives throughout the world, the universities and institutions of higher learning institutions have started optimally utilizing the resources amongst themselves via resource sharing over the network available under various consortia like INDEST, UGC-INFONET and N-List Programme of MHRD/ UGC (INFLIBNET) in India to have 24X7 access to the e-journals, e-books and databases by the faculty and researchers working in the areas of higher studies and research .

3. Library Consortia

A Consortium could be described as a group of organizations who come together to fulfill a combined objective that usefully requires co-operation and the sharing of resources. Library Consortium is an Association of a group of libraries to achieve mutually the common objective. The consortia offer libraries the

ability to give users the access they are coming to expect and demand to a much broader range of materials than any one library could possibly offer.

Library consortia have come up in many countries of the world. In India too several consortia have been developed such as Forum for Resource Sharing in Astronomy and Astrophysics (FORSA), Indian National Digital Library in Science & Technology (INDEST), INFONET project of UGC, Health Sciences Library & Information Network (HELINET), CSIR E-Journals consortium, Department of Atomic Energy Libraries consortium and Indian Institutes of Management Library Consortium. Besides efforts are on to develop consortia by ICAR, ICMR, ICSSR and other government agencies. However if we look into their functioning, it is clear that most of them have been setup with the aim of procuring e-Journals at competitive prices and something sharing the e-Journals resources.

4. Growth and Feature of Library Consortium

- To eliminate problems faced by libraries to provide various services to users;
- To meet the thrust of information of people due to rapid growth of population all over the world;
- To cope up with newly generated knowledge published in different forms, such as printed and non-printed documents, electronics media on various disciplines, multi-disciplinary and new generated subject areas;
- To collect all documents published at the national and international level, because of the library financial shrinkage; and
- To overcome language barriers.

Participation in a consortium has many advantages

- Consortia-based subscription to electronic resources provides access to wider number of electronic resources at substantially lower cost;
- The consortium have been offered better terms of licenses for use, archival access and preservation of subscribed electronic resources, which would not have been possible for any single institution;
- Helpful to provide better library services like CAS and SDI
- The research productivity of all institutions is expected to improve with increased access to international databases and full-text resources.
- Consortia members will also have the benefit of cap on the annual increase in the rates of subscription. While the usual increase in price of e-resources vary from 15 to 20%, the consortia would enjoy the cap on increase in price ranging from 6.5% to 9%

5. Managing E-Resources through A Consortium

- **Selection and Procurement of Information Resources**
- Resource selection for consortia purchase requires considerable care, effort and judicious involvement of the members.
- Some of the criteria for selection of e-resources used for the INDEST-AICTE Consortium are:
    - Well-established multi-disciplinary resources with broad coverage were preferred over highly specialized sources targeted for specialists.
    - The resources already on subscription were preferred over those which were not being used in any member institutions;
    - Resources that are 'electronic-only' were preferred over those that were print-based unless completely unavoidable;
    - Resources that are very important but highly cost-intensive were preferred over those that are less important or less-used but low cost;

- Resources where electronic versions are made available free on subscription to their print versions were avoided as far as possible; and
- Selections were made on their usage / suitability to their respective institutions, e.g. Proquest Science for category I & II institutions while Web of Science for category I institutions.

- **E-resources Negotiation and Purchasing**
  - (Lowest) rates of subscription for all consortium members
  - Requirement of maintenance of print subscription; if yes, is cap on increase in print subscription offered?
  - Extent of coverage of back-files with current subscription
  - Journal level (or article level link) through the Library's OPAC
  - Permission for inter-library loan
  - Archival backup or perpetual access to e-resources
  - Annual increase in rates of subscription
  - Terms of license agreement

- **Consortia Licensing and Agreements**
  - The publishers use licensing as a legal method for controlling the use of their products and services
  - It is important to ensure that all issues concerning consortia licensing of e-content that go into publisher / vendors' licensing agreements are reviewed and understood thoroughly by the consortia negotiation committee and the agreement signing authorities.
  - Develop a checklist of "must-be-present" terms and "not-at-all-agreeable" clauses, to avoid delay in executing the licensing contracts.
  - ICOLC site provides is a very useful reference point in understanding the recommended practices.

- **Promoting Use of E-Resources**
  - Use innovative marketing techniques and out-reach programs in the form of:
  - posters, case-study sessions, user conventions
  - Ensure that all resources get equal and adequate attention, and the newer resources receive greater attention.
  - Training programmes and Annual Meets (both at institute level and consortium level)
  - Consortium Users Group in each member institution
  - Users Convention in member institutions

- **Establish Communication amongst Members**
  - Communication amongst members of a consortium is considered its lifeline.
  - Effective communication motivates members to cooperate, commit to the cause of consortium and align members toward a shared vision.

- Communication is necessary to link each member with the practices of the consortium and to involve them at policy and operational level as a team.
- Communication at Consortium Level
- Communication at Institutional Level

- **Training of Users and Library Staff**
  - Training programmes act as a bridge to facilitate communication amongst members and find answers to common problems
  - Essential for users as well as for the library staff
  - Make users competent to conduct their own searches more effectively
  - Proper training would make library staff more competent enabling them to provide qualitative services.
  - "On-the-job" training programmes are better for benefits users but it also solves localized technological problems that can be solved with the availability of experts at the time of imparting training.
  - Imparting training to members of consortium is a decentralized activity in case of INDEST-AICTE Consortium.

- **Copyright and IPR Issue**
  - All consortium members including potential users as well as librarians should be sensitized on issues of licenses and agreements that consortium signs with the publishers.
  - Users need to be told what, as an authorized user, they are allowed and what they are not allowed. While most of the publishers allow inter-library loan, electronic delivery of articles are not allowed.

Allowed	Not Allowed
• Viewing, downloading, copying, printing and saving a copy of search results • Viewing, downloading, copying, printing and saving individual articles • Using e-resources for scholarly, educational or scientific research, teaching, private study and clinical purposes • Sending a copy of an article to another authorized user (i.e. current faculty, students or staff) • Posting the URL to the publisher's version of the article on a class website (publisher links will allow only authorized users access)	• Use of robots or intelligent agents to do systematic, bulk or automatic downloading • Systematic downloading or printing of entire journal issues or volumes, or large portions of other e-resources • Using e-resources for commercial gain (i.e. reselling, redistributing or republishing of content) • Transmitting, disseminating or otherwise making online content available to unauthorized users • Posting the publisher's version or PDF of an article to an open class website is not permitted

6. Conclusion

The role of Electronic resources has become very important in the present age of ICT. Due to the development of Information Communication Technology and its applications, information is available in

electronic format very commonly and the information in electronic format has become easier and accessible in comparison to printed collection. Availability of huge amount of information and day to day changing expectations of getting information quickly and efficiently are increasing the need and importance of electronic resources. The subscription of e-journals are increasing day by day and the library budgets are shrinking, so it is needed for the library professionals to work together and formulate consortia for subscription to e-journals. Library consortium is the one of the emerging tool kit for the maximum libraries to survive if the libraries have to provide information to their users.

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Marketing of Library and Information Services

Pardeep Rattan **Rupinder Singh**



Libraries had been the treasure of organised information on clay tablets, papyrus, copper sheets, cloth and paper for past civilizations and shall always act as a permanent source of information assimilation and dissemination for the present and future civilizations. The 'user centric' libraries are growing at a very fast pace with growth of information in newer formats based on Information and Communication Technology (ICT). The present paper emphasises the need to implement the means of marketing mix by the libraries for their services to encourage its readership so that the required information, after proper filtration reaches the user's work place, laboratory, home or any other place of his/her activity. The need and challenges to market the library services and products, 4 Ps and 4 Cs of marketing have provided a conceptual base to this paper.



Information Services, Marketing, Marketing Library Services, ICT, Marketing Management.

1. Introduction

Libraries are live organizations, so consideration of future needs culminating into 'Future thinking' is very important. The fifth law of library science given by Dr. S.R. Ranganathan who is considered as Father of Library and Information Science in India suggest that the "Libraries are growing organisms", hence the libraries are facing the dual challenge of accommodating rapidly changing library users and also keeping pace with information and communication technology (ICT). The greatest challenge posed to the library readership is through internet and WWW which facilitates the piece of information at the machine of the reader with a single click from any corner of the world in the quickest possible time. The internet and WWW have forced the libraries world-over to adopt the marketing techniques for the promotion of their products and services.

Rowley (2001)[1] has very rightly pointed the concept of marketing which helps an organisation to manage itself efficiently and effectively by identifying, anticipating and supplying the customer his/her wish-list. Marketing involves human and personal relationships, soft and effective communications, strategy, planning and proper pricing.

There arises an important question of how to organize and manage the ever growing size of collections varied in nature, the services, the users, the staff etc. in a systematic manner and that too in a limited space. The answer to this question is digital libraries and marketing of library products so as to satisfy the needs of end user. Most libraries are already in the business of marketing and advertising their product with the changing words such as advocacy, user friendly relations, public relations and outreach etc.

The libraries which earlier were used to be conservative entities with their traditional activities pertaining to the demands of their users have undergone a tremendous transformation in terms of collection, nature of organising the collection, storage and providing the information to the end user. Over the years the libraries have now acquired the name of information centres. Without doubt all the libraries are information centres but their efficiency lies in providing the pointed information from its resources or from resources of any other information centre in expeditious manner, taking minimum possible time to meet the needs of the user and in a cost effective way. It needs a filtration mechanism in between to meet the differential needs of their users.

2. The Valued Information and Information Flow Process

Information is a socio economic product, its proper organization, transfer and use shapes the socio economic face of a nation. The responsibility of information centres thus lies more in acquiring, packaging

and marketing their products in the form of information services. The massive growth and advancements in combination with the potentialities of Information Technology (IT) resulting from the integration of communication and computers have its impact on all sections of the society. Information forms the very basis of decision making which ultimately affects and decides the further course of development for the society as a whole. Due to information explosion causing information pollution all around, the required information most of the times is diverse and diffused. The process of analysis, synthesis and tailoring of information becomes much important for its easy assimilation.

3. Literature Survey

Many thinkers in the past have put forth their ideas emphasizing the need to market the library services and products in the face of competitions and challenges from WWW and commercial players. Gupta and Jambhekar (2002) focussed on customer centric approach while planning a marketing strategy for library services. The users' expectations and his mind-set need to be watched carefully and accordingly the planning should be executed. The library professionals should also try to change their methods of serving keeping pace with latest techniques and technology for efficient and effective service. Khan and Bhatti (2002) in their study conducted in university libraries in Pakistan evaluated the social media applications in marketing of library services. The study concluded that internet must be provided to all libraries and library customers to utilize social media tools and a library website of each library is must to popularize the services and products of the respective library. Madhusudan (2008) underlines the importance of adopting marketing concepts for libraries owing to the pressures of budget, rising costs of managing information, networking, internet and varied information needs of readers. The study has pointed out that the product development, physical distribution of information, promotion and price adopted as marketing aspects by Goa University library and Information Centre. Dhiman and Sharma (2009) have suggested different techniques for public and academic libraries to popularize their product. Marketing mix according to this study helps the library professionals to serve better their clients by understanding their needs. Sharma and Bhardwaj (2009) have proposed personal skills, e mail, internet, newsletters and leaflets as methods of market promotion for different library product and services including collections, new acquisitions, databases of journals and electronic journals, online versions of papers related to different kinds of competitive exams etc. by creating a marketing and promotional strategy focussing on needs of user.

4. Products and Services to be Marketed

Marketing of library and information services are those sources of information and knowledge which are available to the users in print and non-print form such as manuscripts, books, e books, CD ROMS, journals, specific journal articles, audio video materials, speeches, digital sources, online published matter, in-house and online databases, available on internet through different network providers.

The information services available to a user are the public domain services such as a public library, academic library, Information centre at a work place, research products, subject gateways, consultation services and website development for any organisation.

5. Design and Development of Information Products

Information technology has changed face and increased the pace of creation of knowledge. Editing, Formatting, Printing techniques, Scanners, Storage media, Information retrieval methods – Offline and Online, Databases and Networking is not being used by the libraries but also by the users. The greatest challenge that the librarians now a days are facing, is the management of library and information services and their provision for the end users within limited budgetary provisions.

At the outset the libraries have to first identify their current and potential users, which for an academic library, special library or public library differs. But in case of any library the user group consists of literate individuals who value information. The libraries normally gather and organise information but hardly feel the necessity of user education in terms of information handling. First of all the librarians must acquire

themselves the skill of reaching out to the information sources and information retrieval from those sources and then be mentally prepared to impart such training to the users who needs it. In other words it may be called "Information Support". The types of information products are to be acquired for library keeping in mind the objectives of the parent organisation, the users, time management, financial management and free flow of information for the organisation are also to be kept within the framework for the design, development, monitoring and evaluation of the information products. **The following steps are involved for free flow information:-**

- Communication
- Document creation
- Storage and retrieval
- Internal and external databases
- Information analysis
- Information dissemination
- Publications

6. **Design of 4 Ps and 4 Cs** (Rohit Singh & Ashish Shukla, 2009)[7] also advocates the careful following of certain steps mentioned as under:

+ Product : Customer Needs
+ Price : Cost to User
+ Place : Convenience for User
+ Promotion : Communication to target Audience

After designing the information products the next step is the marketing of those information products.

7. Marketing of Information

Marketing in simpler terms means popularising the information products and services that a library has to offer to its users. It also involves the exchange of information from a library with the library users and sister organisations. This exchange of information can be free or some sort of membership fee for a public library or the library fee as charged in the total fee of students or floating readers in an academic set- up. The valued feedback of library readers and implementation of web 2.0 tools will fetch a much needed strategy for popularizing and sharing of library services globally.

8. The Concept of Marketing

"Marketing is the analysis, planning, implementation and control of carefully formulated programmes designed to bring about voluntary exchanges of values with target markets for the purpose of achieving organisational objectives. It reties heavily on designing the organisations offering in terms of target markets, needs and desires and on using effective pricing. Communication and distribution to inform motivate and service the markets" (Philip Kotler, 1972)[8] and a social definition as suggested by (Philip Kotler, 2004)[9] is – " marketing is a social process by which individuals and groups obtain what they need and want through creating, offering and freely exchanging products and services of value with others.". The managerial aspect of marketing is "the art of selling products".

The following definition of Marketing seems to be more near to the concept of marketing in library terminology –

- "Marketing is a stance and an attitude that focuses on meeting the needs of users. Marketing is a means of ensuring that libraries, librarians and librarianship are integrated into both today's and tomorrow's emerging global culture. Marketing is not separate from good practice. It is a good practice." (Kumar, 2003).

- Zachert & Williams (1986) considered marketing as" the planning that focuses on products ,place or mode of delivery, adjustment of cost/price to the market and promotion to specifically targeted segments of the special librarian's market."
- Marketing by The American Marketing Association is defined as "an organisational function and a set of processes for creating, communicating and delivering value to customers and managing customer relationships in ways that benefit the organisation and its stakeholders."
- According to Peter F Drucker (2003) "the aim of marketing is to know and understand the customer so well that the product or service fits him and sells itself."

The above definitions have following attributes of marketing in common:-

- Organisational Function
- Carefully formulated policies
- Organisational objectives
- Customer centric
- In line with need and want of the customer
- Customer satisfaction
- Benefit to all stakeholders

In Information context, while marketing the information product and services the organisations have to –

- Monitor the needs of users and non-users,
- Identify the needs of its users and synchronise its service products with them to satisfy the end user,
- Communication of its products to the users,
- Feedback of its services from users to ascertain the satisfaction of the users.

Hence, the user is all important on whom the objectives and services of any organisation are to be focussed. However, this approach in practice seems to be on a slower side because of many aspects of human nature. In an organisation where individuals and departments internally are not treated with respect and dignity, one can be pretty sure that their external customers are not treated with respect and dignity either. (Gupta, 2002) opines that Employers, employees, departments and vendors are all customers to each other.

Libraries are basically non-profit service organisations and are also spending institutions as they buy information products from open market and are always short of finances to properly manage and satisfy each and every user.

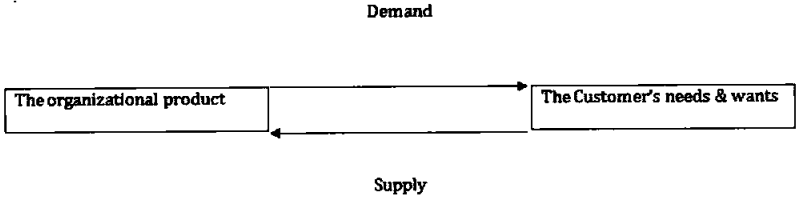
- **The need to market the service products** arose basically to get the optimal exploitation of information resources by way of advertising the services – free of cost or by attaching nominal charges for the services provided and more over because a sort of seriousness is attached when certain product is available only on some payment. It also adds to the Value of the document. The human mind set also suggests that it appreciates and utilizes that service in a proper way which is not free and whose use is restricted. What is needed is to read out the typical mind-set of the user in a way by which the user will use the library services in a better way.

The emphasis should be on- how to become better communicators? (Mathews, 2005)argues that the encouragement should be on Discover-Design- Display of information because libraries help in providing information on inter-disciplinary contents, emerging technologies, forms of expression and also help in developing critical and analytical thinking

- **The Approach towards Library and Information Services' Marketing should be**
  - How the library fits into the social, cultural and information seeking behaviour of the user.
  - Library to act as an institution of interaction and support for all the academic and social endeavours of the user.

- Fitment of the library into the life of the user.
- Library to act as a campus commune.

The **Matching Process of Marketing** shall also be taken into consideration while following the approach of marketing the products as shown in the following flow chart:



9. Barriers / Challenges to Market the Information Services

Since libraries are the service agencies and in spite of the fact that the status of library depends on the collection, services and attitude of the library staff and hence the user satisfaction, the librarians themselves are not very sure of the concept of marketing their services. It becomes imperative on the part of the librarians to implement their marketing strategies in their libraries. The fundamental challenges that may summarised as below:

- **Funds and Personal Attitude**: Lack of funds is a major hurdle for advertising the services a library is offering for different kinds of users, when the fact is no library at any time is sufficient with the funds. The other challenge librarians do not have a positive attitude towards the development of their own institution and do not try to personally contact the user regarding their needs and problem solving.
- **Training and Education**: Lack of knowledge and training about the marketing techniques and means is another barrier in marketing the products. Sometimes librarians are not aware of the benefits that they can reap with the marketing of their products.
- **Variety in Products and Clientele** : Libraries world over are offering new and varied products & services to a variety of users ranging from general books to internet access and from little children to senior citizens. To satisfy and making aware all the population is an uphill task.
- **Lack of Perception**: The librarians many times remain unaware and do not take interest in the economic aspect of buying the information products and also from the requirements of the users.
- **Casual Approach**: Casualness in identifying and providing information to the serious readers, current readers and potential users.

The above barriers can be overcome by **IMPACT FACTORS OF MARKETING** as shown in the following figure:-

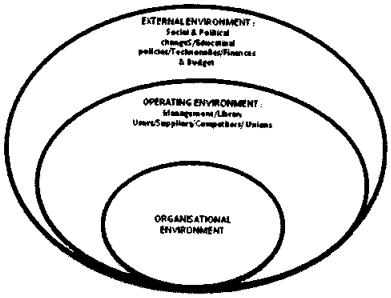
- **Promotion:** Promotion is basically the means of informing the users what you do, what you can do, what you have, how to reach at the products and make use of information sources (in-house and external). It is the methodology of achieving the objectives in the organisation. (Sharma & Bhardwaj, 2009) have suggested certain steps that are involved in the promotion of library product services like, **A description of service requiring publicity, Description of target audience, Types of publicity and methods of distribution, Analysis of promotional campaign.**
- **The Media for Promotion**
  - Communication Skills : user to user/ personal attention
  - Newsletters , bulletins, publications, leaflets
  - SMS / E Mail
  - Library website
  - Library Portal
  - Web-blogs

- **Communication** also involves:
  - Who is our target audience?
  - What do we need to communicate?
  - How should we communicate this?
  - Where should we communicate this?
  - When do the communications need to take place?

Libraries are the spending and non-profit organisations and seldom create any product to market. These are generally buyers and facilitators of information and buy non-print & print information materials. Application of modern marketing techniques is must to provide cost effective information services and also to enhance the existing status of library in terms of user satisfaction score.

The modern marketing techniques involve Analysis, Planning, Implementation and Control of programmes designed to create, build and maintain beneficial exchange with the target users for the achievement of organisational objectives. What the user wants to have and when he gets that, ends the marketing, i.e., **the marketing starts and ends with the library user.**

- **The Marketing Environment**
  - Promotion, selling, advertising and dissemination/distribution.
  - Publicity
  - Displays/Exhibitions/Demonstrations/Posters/Lectures etc.



10. The Cost-Effective Factor

Following activities may be helpful to a great extent in providing the cost effective library services. Until now the libraries were providing any of the services free of cost but recent trends have shown 'Charging trend', especially for the specialised services, service on demand and in a time frame, research articles, paid journal articles and so on.

- Consortia and Resource Sharing.
- Acquisition Policy must depend on Organisational objectives
- Union Subject Catalogues at regional and national level/
- Networking

And the libraries can charge for their services from the library users for their access to library collections, for accessing rare documents, from the floating readers, from sale of house made databases, notes or collections regarding certain exams or for career building documents, publications and for online access to international databases.

11. Conclusion

The ever changing landscape of libraries in terms of needs of the library users, nature and packaging of information documents and advances in information technology have forced the libraries to explore new

possibilities and potentials to face the challenges posed by internet, scarcity of funds, vast expanse of ICT based infrastructure and applications and corporate competitions. These opportunities shall help the librarians to promote the cause of their organisations so as to achieve the organisational objectives. One such objective is to get maximum user satisfaction. The objectives of any library can be best achieved by acquiring quality products and by implementing modern marketing strategies based on five elements -products, distribution, staff (attitude & training), price and communication.

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Marketing of Library Products and Services in Digital Environment: *Some Insights*

Jayarama Naik, K G **Radhakrishna, B R**



Libraries and information centres in a context of change /transformation: External forces (political, economic, social, managerial, technological) Changing financial environment and increased demand for services from users. Market research and segmentation, Consumer analysis, Market positioning (Prioritizing clients, groups and information services) marketing programme (Optimal mix of products, costing and pricing, promotion, distribution, delivery mode) Market Audit (evaluation of plan and implementation). In this paper authors discussed basic concept of information marketing, differentiated between sales concept and marketing concept and narrated the plan for marking of information products and services. The paper concludes with strategies for information marketing.



Information products and Services, Marketing of information, Digital environment.

1. Introduction

Marketing of information is one of the newest concepts to apply to library and information centers activities and functions more particularly promoting innovative and emerging library products and services. Libraries can benefit by letting the community know just what part of everything the library provides. Ultimately you want to match library strengths with users' needs. Marketing positions your library in the minds of the community as a "go-to" source for information and helps users understand what you have to offer them. Marketing builds good customer relations, and contributes to a positive relationship with media, businesses, local government agencies, and organizations.

Often marketing is about changing perceptions -- ours and theirs! Everyone benefits when we find out what users really want, and when we let our community knows everything that a library can do, in the library or on the Web.

2. Marketing of Information: Some Basic Definitions

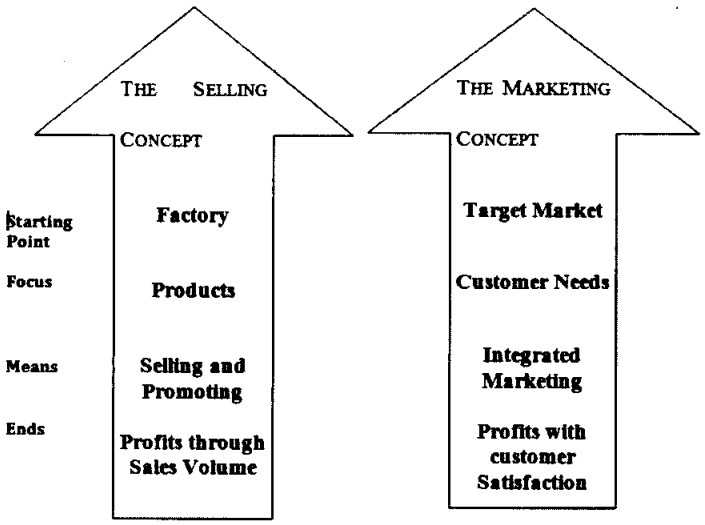
"The process of planning and executing conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational objectives." (Peter D. Bennett, 1995).

"A social and managerial process by which individual groups obtain what they need and want through creating, offering, and exchanging products of value with others." (Kotler, Philip, 1997,

In libraries, the "exchange" part of the marketing process may consist of continued taxpayer support in exchange for valued library services.

3. Contrast between the Sales Concept and the Marketing Concept:

Selling focuses on the needs of the seller; Marketing on the needs of the customer, information consumer. Selling is preoccupied with the seller's need to convert his product into cash; Marketing with the idea of satisfying the needs of the user/customer by means of the product and the whole cluster of things associated with creating, delivering and finally consuming it.



4. The selling concept takes an inside-out perspective:

It starts with the factory, focuses on existing products, and calls for heavy selling and promoting to produce profitable sales. The marketing concept rests on Four Pillars:

- Target Market
- Customer Needs
- Integrated Marketing, and
- Profitability.

- **Target Market:** Companies do best when they choose their target market(s) carefully and prepare tailored marketing programs. A market can't satisfy everyone in a market. Everyone don't like the same soft drink, hotel, automobile, college, and move. Therefore, marketers start by dividing up the market. Examining demographic, psychographics, and behaviourable differences among buyers can identify market segments. The marketer than decides which segments present the greatest opportunity which are its target markets. e.g., Volvo Cars and Bus
- **Customer Needs:** The Library and Information Centers can define its target market but fail to correctly understand the customers' needs.
  - The market must try to understand the target market's Needs, Wants and Demands.
  - Needs are the basic human requirements. People need food, air, water, clothing and shelter to survive. People also have strong needs for recreation/entertainment, education etc.
  - These needs become wants when they are directed to specific objects that might satisfy the need.
  - Wants are shaped by one's society. Demands are wants for specific products backed by an ability to pay.
- **Integrated Marketing:** When all the company's departments work together serve the customer's interests, the result is integrated marketing. Unfortunately, not all employees are trained and motivated to work for the customer. e.g., Indian Railway System. Integrated marketing takes place on two levels.
  - First, the various marketing functions such as sales force, advertising, customer service, product management, marketing research- must work together. All these marketing functions must be coordinated from the customer's point of view.

- Second, marketing must be embraced by the other departments; they must also think customer. According to David Packard of HP: Marketing is far too important to be left only to the marketing department! Marketing is not a department so much as a library orientation.

Traditional Organization Chart	Modern Customer-oriented Organization Chart
Top Management	Customers
Middle Management	Front-line People
Front-line people	Middle Management
Customers	Top Management

- **Profitability:** The ultimate purpose of the marketing concept is to help organisations achieve the objectives.
  - In the case of private firms, the major objective is long-run profitability;
  - In the case of non-profit and public organisations, it is surviving and attracting enough funds to perform useful work.
  - Private firms should not aim for profits as such, but rather to achieve profits as a consequence of creating superior customer value.
  - A library makes popular by satisfying customer needs better than its competitors.
  - However, most libraries and information centers do not embrace the marketing concept until driven to it by circumstances. Various developments prod them to take the marketing concept to heart.
- **The objective of marketing of information is to;**
  - Enhance the use of information
  - Generate resources for running the service continuously
  - Facilitate production of user oriented rather that producer oriented products.
- **Information marketing Requirements:**
  - Identification of target customer/user groups
  - Determination of their needs
  - Designing of services/products appropriate to their needs
  - Choosing right type of distribution channel
  - Feedback and evaluation of products
- **Plan for Market of Information**
  - Based on the market research done to understand the needs of the customers.
  - The Marketing Audit, PEST, SWOT these analyses the library's positioning in the market.
  - The next step is to develop a marketing plan that lays out the actual process or activities to achieve the goals and objectives set by the library.
  - For an effective plan, relevant marketing activities targeted at the right audience must be well coordinated, and executed by staff with the right caliber.

A good marketing plan begins with a mission statement that defines the objectives of the library or the information centre, which includes an identification of the target market segments.

- **Conducting a Marketing Audit:** The marketing audit consists of an analysis of the library's
  - external environment (competitors, patrons, sponsors, and developmental opportunities) &
  - an assessment of the internal environment (library's strengths and weaknesses).

  As an ongoing process, the staff planning the audit should involve all stakeholders –
  - Different level of staff, board members and community members, before deciding what elements to cover.
  - Care is needed for developing procedures for data collection, analyzing collected data, preparing and presenting results and recommendations to the management.
  - The process of conducting the marketing audit provides a basis for informed decision-making and contributes to the final marketing plan.
  - Some libraries include an analysis of the 4Ps (that is, the marketing mix) as part of the systematic efforts in a marketing audit.

- **PEST:**
  - **P**olitical factors,
  - **E**conomic factors,
  - **S**ocial factors, and
  - **T**echnology factors.

  These are all elements that may have an effect on your future library activities. Make a list of all factors that may be either beneficial or detrimental to the success of your marketing efforts to run a good library.

- **SWOT**
  - **S**trengths,
  - **W**eaknesses,
  - **O**pportunities and
  - **T**hreats and is critical to your marketing plan.
  - To build a good marketing plan for the library one of the anchoring steps is the identification of SWOT.
  - By completing the review of your activities and your market place, you should be armed with the information necessary to identify your SWOTs and PESTs.
- **Information Marketing Strategies:** The plan specifies marketing strategies, the promotional methods chosen to suit the target audience.
- Strategies in the plan depend on the user group and/or the service being offered. The "marketing mix" that you need to consider consists of the four Ps (product, place, price, promotion).
- Select the Products research determined were needed, use the Place or method of delivery your users want, calculate the Price or budget to develop and promote the service, and choose Promotion methods targeted to your users.
- Methods include public relations, advertising, direct mail, telemarketing, Internet, public service spots on TV, local radio station, monthly book review column in your local paper, visual displays, press releases, comprehensive media campaign, etc. Methods are based on assessment of users and the nature of the product. (An example for a YA event would be a letter to teachers or advertising in the school paper.) Learn from others.

5. Conclusion

Any successful library must have knowledge about prospective or current clients and must implement a marketing plan that is regularly revised. Unlike the longer-term strategic planning documents, marketing plans in libraries should be revised annually, like a annual budget, and should reflect changes and revised goals based on the previous year's experience. A marketing plan is an important tool for making your library victorious in this age of change, where working smarter is necessary to achieve your desired results.

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Marketing of Library Products and Services

Milind B Anasane **Manohar K Katkar**



Marketing is the essential process of promotion of product that is market oriented. It is fulfill the objective of organization or company and demand of customers. Marketing is gaining importance in business. Similarly marketing of library services is also obtaining importance in library functions. Because it has help to fulfilled the objective of library and user demands by creating various product and providing library services. This paper defines the concept of marketing, marketing mix and application of the four elements of marketing mix (4Ps) in the library has been discussed.



Marketing, Marketing Mix, Elements of Marketing Mix (4Ps)

1. Introduction

In this modern era marketing means learning from customers, listening to customers and transforming the organization around customers. The basic objective of marketing is to attract the new customers by promising and offering superior value to retain and grow current customers by delivering satisfaction. All successful companies know that if they take care of their customer's market share and profits will follow.

According to Philip Kotler: "Marketing is the analysis, planning, implementation, and control of carefully formulated programmes designed to bring about voluntary exchanges of values with target markets for the purpose of achieving organizational objectives. It relies heavily on designing the organization's offering in terms of the target market's needs & desires and on using effective pricing, communication and distribution to inform, motivate & service the markets." The recently the definition of marketing is approved by the American Marketing Association Board of Directors "Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large." (Approved July 2013)

Today's library is the play the role of information center. By adapting to the rapid changes in information storage and delivered the information to users with appropriate new tools. The functions and services of the library, user's demands and impact of new technology is the biggest challenge in front of library. Therefore for accepting of these challenges library has adapted the use of marketing of library services concept. Marketing of library services is the process of products and services development, promotion of products and services, distribution of products and services to satisfy the user's requirements and created relation with users. It is support to the aims and objective of library, improving the status of library and library professionals in the society and defining the exact path to providing and promoting the library service to its users.

2. Marketing and Library

The term marketing includes all resources and activities necessary to direct and facilitate the flow of products and services from the producer to the consumers. Thus in common manners, marketing means the process of distribution of products and services. There are two broad concept of marketing i.e. product oriented of marketing (Commercial marketing) and product oriented of marketing (social marketing). In product oriented of marketing, give the importance to the products but in product oriented of marketing the consumers are given more importance.

The library is considered as a non-profit and users oriented organization. Library has recently become aware of the need to market their products and services. So Library is being started the used of their products and services as commodities and that can be sold, delivered, exchanged, and transmitted. Marketing is the

instrument through which library objectives can be fulfilled. Information Marketing is essential in the library, because it has developed the relation between library and its users and improves the image and status of the library and library professionals. Therefore library needs to build, develop and maintain a relationship with their users and followed the social marketing strategies.

Kotler and Andreasen, define social marketing as "differing from other areas of marketing only with respect to the objectives of the marketer and his or her organization. Social marketing seeks to influence social behaviors not to benefit the marketer, but to benefit the target audience and the general society." (Nedra Kline Weinreich)

Marketing strategy mean the overall strategy of an organization in relation to a particular market. Marketing plans will form part of this process, in particular when it comes to implementation. A productive marketing strategy requires that all aspects of the marketing mix be considered. The Components of an overall marketing strategy are product, planning, distribution strategy, promotional strategy and pricing strategy. Marketing mix elements are subsets of the marketing strategy. Marketing mix or 4Ps namely product, price, promotion and place. (Mohammad Ansari-2010)

3. 4Ps and Library

The library is the service based organization and service is a performance offered by library to users. It is activity that creates value and provides benefits for users at any time and any place. Marketing mix is a dynamic concept because of its variation in accordance with the change of the needs of the users and environmental factors. thus the purpose behinds its determination in library is to meet the need of users and the library in the most effective and economical manners. However, marketing mix basically focus on the users who are the axel around which all the activities of the firm revolve. Therefore service marketers believe in the inadequacy of 4ps models of marketing mix for services. These useful elements are discussed below.

- **Product:** Product is the most important elements in the marketing mix of company It includes the physical product features, service, manufactures etc. for the library concern physical products our library book collection periodical, video cassettes, CD Rom,e-books, e-journals, online data bases, bibliographies etc. and service is CAS SDI document delivery service, resource sharing and other value added service Generally product of the library can be marketed by reference section. The success of library marketing is depends on the library product if the product itself is of a poor quality it will fail to attract the users. That will according to Prof Kotler "Product is anything that can be offered to a market for attention, acquisition use or consumption that might satisfy a needs (Bose, D. C)

- **Price:** Price is an essential aspect of the marketing and a decision making issue as this can make or more a concern. Price includes the actual expenses incurred in marketing of a product, while the price is a matter of policy and as such can be fixed as per the company's objective. Similarly pricing of use of library services depends upon the product of library. The pricing in library services include the price of national & Foreign journal, research papers, online data base library consortia Pricing should in accordance with the quality of the material

- **Place :** Place is concerned with the physical distribution area where the product should be made available and distributed to the users For the library is concerned it is a place of service based upon knowledge of the market of library is essential in order to identify users and their information needs. This Location has an effect upon how the library can best access their product offerings for expansion of the service area; library must have branches reprographic service electronic & online services and communication this information to the potential users.

- **Promotion :** The Term Promotion refers to the persuasive communication about the product It is the Final Elements in the marketing mix the main goal is to enhance product awareness and develop favorable attitudes among the existing and prospective users. The promotion is the promo tools it

include various forms of advertising presentations demonstration displays and personal selling. It is regarded as a part of public relation for keeping continuous contact with users. Similarly library also uses the some methods for the promotions of library services. Library Included publicity point of sale displays, personal contact, Broachers, leaflets, newsletters SMS service email service etc.

4. Benefits of library marketing

Library marketing is the useful technique for the library, which is fulfill the objectives library. The library marketing is beneficial library for:

- Promotion of the use of information resources;
- Make sure the optimum use of information.
- Enhance the status of the library and library professionals.
- Introduce information communication technology systems in library services
- Support to the funds of library
- Gaining the support from library reader

5. Conclusion

Marketing of library services is an essential process in the library management and use of library services for optimal use of information. It is the effective technique for fulfill the satisfaction of users by providing various information products and increasing the status of library and library professionals in the communities.

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Marketing Plan for College Libraries in Digital Era: *A Study*

Parita Desai

The college library has been from its inception an integral part of institutions of higher learning, rather than an appendix or adjunct. Over the past several years, college libraries have been facing challenges from advancement of ICT, varied user needs and constraints of Budget. Because of all of existing challenges and intensifying changes, it is not surprising that at least a handful of College Libraries have move forward marketing their products and services. Marketing plan is the fundamental step in the marketing process. Successful plan is not necessarily the most accurate, best written or the best presented. It is the one that is implemented. This study examines the preparation, implementation and monitoring of marketing plans by College Libraries.

College Library, Marketing, Marketing Plan

1. Introduction

A College library is responsible for the most efficient use of resources at its disposal. Mostly College libraries depend on Library fees and support from state government and U.G.C. grants, for serving a limited set of clients, mostly students, faculty members, researchers and members of the parent body. In this information age, prices of the information resources are increasing and the technologies for acquiring, storing, as well as for delivering the information to clients are developing continuously and becoming costly, at the same time needs of user are changing by every now and then due to advancement of technologies acquiring and accessing the information. Students and faculty of College Libraries is no longer a captive audience because many do their own research and get other information related to their study, using Internet. Many Information centre have come up which provide the required information at reasonable rate, in time at their door step. Users don't need to go to the library for access of required information. Both students and faculty are seeing less value in the Library infrastructure. In such situation for College libraries it becomes very difficult to meet the increasingly diversified and complex needs of emerging and different user groups with available resources and to survive in this competitive market. Under such situations, marketing of products and services and library as a whole has become need of the hour. And for effective marketing College Libraries will need to set specific objectives to be achieved, client groups to be served, their priority, as well as financial targets in consultation with the management of the parent organization. Thus, preparation, implementation and monitoring of marketing plans by College libraries have become a critical activity for the very survival of a College Library.

2. Literature Review

Weingand, Darlene E. (1987) in his book presents marketing concepts and planning as being inter-related and complementary. Part one of the book examines the definition and components of marketing. Part two focuses on the planning process, including setting marketing objectives, conducting marketing audits, and establishing a goal. Overall, the book stresses that planning and marketing are prerequisites to a successful information service and can be used as a guide by information professionals Kassel, A. (1999) focuses on the concept of Marketing Plan. Regularly revised marketing plan can help a Library to achieve success, even in our increasingly digital time. Besides listing steps involved in creating a marketing plan, gives hints and tips useful to develop a marketing plan. Nkanga, Nndoniah Adonis. (2002). In this paper a study of selected information providing institutions, in particular special libraries, in Gaborone, Botswana, reveals that a majority are in favor of marketing their services to their users. In practice, very few libraries undertake formal marketing planning and prepare marketing plans. Marketing was therefore unplanned not result oriented. Booth, Tracey (2004). The author tries to explain how to identify the information needs of Library

user by examining both internal and external environment of organization and the user. She explains how these needs can be used as a basis for developing an effective marketing plan and strategy. Ravichandran, M. Babu, S. Dhinesh. (2008). According to these authors the foundation for a great marketing plan of Library and information services is to examine mission, values, and philosophy of service. Then analyze Library capabilities and research customers to find out what works or what needs improvement. And then it is essential to use a research to establish goals, select strategies for promotion, develop the marketing plan, implement and evaluate how well the libraries meet their goals.

3. Objectives of Study

- To discuss the nature of the marketing plan as a strategic document and a blueprint for implementation.
- To examine the planning process implemented by College Libraries.

4. Scope and Limitations of Study

Scope of the study is limited to the College Libraries situated between Virar to Churchgate in Mumbai city.

5. Research Design and Methodology

- **Research design:** The present study is descriptive and analytical in nature.
- **Sources of Data:** This study is based on Primary and Secondary sources of data. Primary data were collected from College Librarians by means of questionnaire.
- **Sample Size:** The sample consisted of 105 College libraries in Mumbai region. Out of 86 responses were received. The final sample amounted to 81.90 per cent of the total population.

6. Analysis of Data and Discussion: The study arrived at the following findings based on the results from the analysis of the data gathered:

Table I: Respondent by Type of Institution

Library by Type	Frequency	Percentage
Arts, Science and Commerce Colleges	56	**65 %**
Management and Engineering Colleges	30	**35 %**
Total	**86**	**100 %**

The questionnaire was distributed to 102 Library professionals (Librarians) of all the College libraries under study. Of the responses, 86 (84.31 per cent) were received out of 102. The respondents were mostly from Arts, Science & Commerce College libraries (65 %), and Management and Engineering College libraries (35%).

Table 2 - Need for planning process in marketing Library products and services

Parameters	Frequency	Percentage
Strongly Agree	33	**38 %**
Agree	52	**61 %**
Undecided	0	**0**
Disagree	1	**1 %**
Strongly disagree	0	**0 %**
Total	86	**100 %**

Table 3 - Development of systematic Marketing Plan by College Library

Parameters	Frequency	Percentage
Yes, Randomly depending on situation	4	**5 %**
No	82	**95 %**
Total	86	**100 %**

99 per cent College Libraries agrees with the need for development of systematic marketing plan but at the same time almost all the respondents do not develop the systematic marketing plan except 5 per cent of respondents who develop at random that is not on regular basis but randomly.

Table 4 - Need for Formulation of Planning Team

Parameters	Frequency	Percentage
Strongly Agree	25	29 %
Agree	3	3 %
Undecided	51	60%
Disagree	3	3 %
Strongly disagree	4	5 %
Total	86	100 %

Table 5 - Separate Planning Team formulation by College Library

Parameters	Frequency	Percentage
Planning Team	10	**12%**
Library committee	76	**88 %**
Total	86	**100 %**

60 per cent of College Libraries are not able to decide the need for formulation of separate Planning team, and 31 per cent admit the need for separate planning team. But in practice only 10 per cent College Libraries have separate Planning Team rest of the College Libraries depend on Library Committee only.

Tables 6 - Target groups of College Libraries

Parameters	Frequency	Percentage
Students	86	100 %
Faculty Members	86	100 %
Professionals	28	33 %
Researchers	36	42 %

College Library appears to be heavily oriented to under graduate and post graduate courses. The target market of College Library was mainly students and teachers.

Table 7 - Environmental Analysis in College Library

		Frequency and Percentage						
	Parameters	**SA**	**A**	**SA+A**	**UD**	**D**	**SD**	
A	Financial Status of the organization	22 (25%)	41 (48%)	73%	12 (14%)	11(13%)	0	86(100%)
B	Library Services	34(40%)	52(60%)	**100%**	0	0	0	86(100%)
C	Library Collection	32(37%)	48(56%)	**93 %**	2(2%)	4(5%)	0	86(100%)
D	Library Staff	45(52%)	31(36%)	88 %	7(8%)	3(4%)	0	86(100%)
E	Competitors	37(43%)	30(35%)	78 %	10(12%)	9(10%)	0	86(100%)
F	Physical Environment	23(27%)	52(60%)	87 %	7(8%)	4(5%)	0	86(100%)
G	Technology	36(41%)	34(40%)	81 %	13(15%)	3(4%)	0	86(100%)
H	Management Support	49(56%)	31(36%)	**92 %**	3(4%)	3(4%)	0	86(100%)
I	User Need	67(78%)	33(22%)	**100%**	0	0	0	86(100%)

Table 8 - Frequency of conducting Environmental analysis

Parameters	Frequency	Percentage
Regularly	5	**6%**
Often	15	**17 %**
Occasionally	18	**21 %**
Seldom	48	**56 %**
Never	0	**0**
Total	86	**100 %**

Above 90 per cent of College libraries agree with analysis of Library products and services, Users Need and management support, followed by Library Staff (88 per cent); Physical Environment (87 per cent);Technology (81 per cent);Competitors (78 per cent); and Financial status of the Organization (73 per cent). But in practice only 6 per cent College Library conduct the environmental analysis thoroughly on regularly.

Table 9 - Need for formulation of Marketing Strategy

Parameters	Frequency	Percentage
Strongly Agree	30	**35 %**
Agree	55	**64 %**
Undecided	0	**0**
Disagree	1	**1 %**
Strongly disagree	0	**0 %**
Total	86	**100 %**

Table 10 - Development of systematic strategies by College Library

Parameters	Advertising	Public Relation	Channels of Distribution	Product Policy
Yes, Depending on situation	26 (30%)	70 (81%)	10 (12%)	40(47%)
No	60 (70%)	16 (19%)	76 (88%)	46 (53%)
Total	86 (100%)	86 (100%)	86 (100%)	86 (100%)

99 per cent of College libraries agree that there is need for formulation of Marketing Strategy. 81 per cent College Libraries develop systematic Promotional strategies.

Tables 11 - Availability of separate Budget for Marketing Strategies

Parameters	Frequency	Percentage
Yes	18	**21%**
No	48	**56 %**

Only 21 per cent of College Libraries have separate Budget for development and implementation of marketing strategies

Tables 12 - Methods of Evaluation

Parameters	Frequency	Percentage
The Mail Survey	27	31 %
The Focus Group	22	26 %
The Interview	29	34 %
Suggestion Box	66	77 %
Personal Interaction	5	6 %

77 per cent College Libraries use the suggestion box for assessing users need. 34 per cent conducts interview, 31 per cent rely on mail survey, 26 per cent concentrate on focus group, and only 6 per cent assess the users need though personal interaction.

7. Suggestions

- Each College Library should develop suitable marketing plan for its products and services with a mission to serve its parent organization on an annual basis with sufficient funding
- College Library should reorganize the role of Users, Library staff and Teaching faculty into teams. The new team environment allows Library to maximize talents and resources.
- The College libraries should identify different types of users and prospective users in order to determine specific information needs of each target group.
- A marketing programme in College libraries needs to adjust to both internal and external realities if it is to succeed. College librarian should analyze all internal and external factors affecting the environment of College Library in detail and on regular basis.
- College Libraries should make proper strategy relating to advertising for to make the user aware about Library products and services; Public Relation strategy for promotion, and strategy for channel of distribution for delivering right product at right time in right manner.
- Libraries should constantly maintain and improve the quality and range of its services/products and match these to the changing requirements of the users.
- There are various methods such as mail survey, focus group, interview, personal interaction, through tools of social networking such as blogs, website, etc. for collecting information from users for assessing their needs and evaluating the Marketing strategies adopted by Library. So College Library should select the appropriate evaluation method depending upon their need and financial position. And based on the feedback should make appropriate changes in Marketing strategies.
- Finally Management, other governing bodies should provide appropriate funds at right time for effective implementation of marketing strategies.
- Librarian and staff should be facilitated through workshops and seminars to acquire and sharpen ICT skills, managerial skills, marketing skills, interpersonal skills, communication skills, and leadership skills and so on.

8. Conclusion

To succeed in the new information market in digital era, which stresses competition and consumer convenience, College Libraries must develop successful marketing plan that aggressively reach out to their customers. Regularly revised marketing plan can help a Library to achieve success, even in our increasingly digital time. In this study it is revealed that very few libraries i.e. only 5 per cent of College Library undertake formal marketing planning and prepare marketing plans. Only 10 per cent College Libraries have separate Planning Team. Target group of College Libraries are Staff, Students and Researchers. Segmentation can be made on courses (e.g. Arts, Science, Commerce) on personal factors (e.g. demographics, situation), psychological factors (e.g. perception, motives, attitude) social factors (e.g. family, reference groups). Only 6 per cent College Libraries consider all the factors while conducting environment analysis, majority of College Libraries put emphasis of Library products/services, Management support and Users need only. Regular, systematic through Environmental analysis may increase chances of achieving objectives of Marketing Plan. While defining marketing strategy, majority of College Libraries i.e. 81 per cent concentrate on Promotional strategies only. There must be proper balance between various marketing mix depending upon the availability of resources and requirements for achieving goals and objectives of College Library.

Finally, evaluation should be formative as well as summative and the plan should be flexible enough to accommodate the changes. It is through planned marketing that marketing can assume its full role as a vital management tool. This is because firstly, what marketers do must necessarily fit with what the organization

as a whole wishes to do. Secondly, Library marketing is no longer confined to promotion alone. It must be forward looking and based not only on today's competitive situation, but also on a careful study of the competitive situation the organization is likely to face in the future in digital world. And since marketing plan is the "spine" upon which the year-to-year the marketing actions will hang, it should be well articulated, thorough, flexible and valid for relatively long stretches of time.

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N-LIST Programme and General Degree College Libraries under Vidyasagar University of West Bengal: *A Web-based Survey*

Debkumar Mal



A number of new products and services have been raised in the present day libraries with the help of Information and Communication Technology (ICT). Electronic Resources, i.e., E-Resources are nothing but the products of ICT. The E-resources offer users a great chance to consult more and more information resources. The N-LIST Programme of UGC-INFONET Digital Library Consortium and INDEST-AICTE Consortium provides access to a number of electronic books, electronic journals and bibliographic databases. The INFLIBNET Centre regularly conducts awareness and training programmes in various universities to generate awareness regarding availability of e-resources to colleges under the N-LIST Programme. This paper discusses regarding the registration of N-LIST Programme taken by General Degree College Libraries under Vidyasagar University of West Bengal based on a survey through Web. The author also describes that whether the said colleges have their own website or not and the importance of Library Professionals as Administrative or Technical contact persons under the said consortium.



Electronic Journals, Electronic Books, Electronic Resources, Consortium, UGC-INFONET, INDEST-AICTE, N-LIST, General Degree College Libraries.

1. Introduction

College is one of the most important academic institutions of higher learning in our society. Normally we are speaking that the Library is the heart of every institution. The aim of any institution is to impart instruction & to establish a knowledge-base to the students' community and the main intention of its library is to become an instrument of instruction.[9] Today we are living in the age of information. Libraries are functioning under constantly changing environment and facing more and more complex challenges like ICT (Information & Communication Technology) revolution, information explosion, information pollution, network revolution, shrinking library budgets, high level of user expectations, etc. As the printed books and journals are very much costly, the concept of 'Consortium' has been evolved in a rapid fashion. The Consortium is based on the concept of resource sharing through networking of libraries. The libraries are banding together to get maximum benefits from the consortia. General Degree College Libraries should give the priority to automation and speedy availability of electronic resources, particularly e-journals and bibliographic databases. The two most popular consortia, viz., INDEST-AICTE Consortium and UGC-INFONET Digital Library Consortium in India should be mentioned specially in this context.

2. Methodology

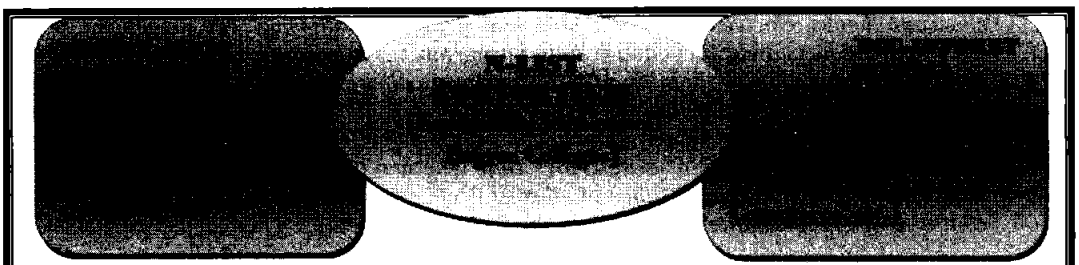
The survey method was followed for preparing the present article. The survey was conducted among the websites of different General Degree Colleges affiliated to the Vidyasagar University of West Bengal, websites of Vidyasagar University, Department of Higher Education, Govt. of West Bengal, INFLIBNET Centre, and N-LIST Programme of UGC-INFONET Digital Library Consortium & INDEST-AICTE Consortium.

3. Scope and Coverage

There are 41 General Degree College Libraries under Vidyasagar University of West Bengal, which are under the purview of the present study. The period coverage is up to 2012, the year of establishment of colleges.

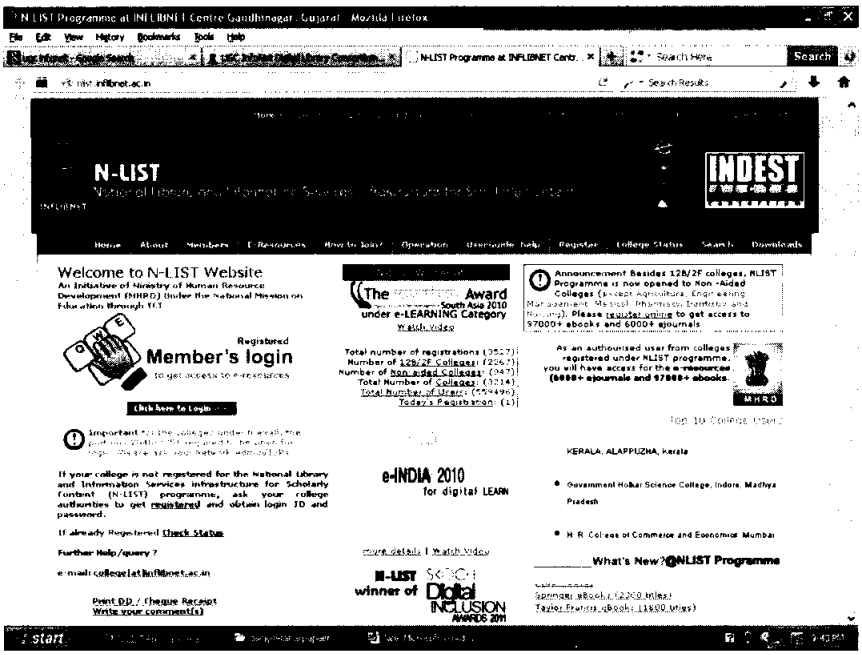
4. N-LIST Programme

The N-LIST Programme, i.e., National Library and Information Services Infrastructure for Scholarly Content, an initiative of Ministry of Human Resource Development, Govt. of India under National Mission on Education through ICT (NME-ICT), was jointly executed by the UGC-INFONET Digital Library Consortium, INFLIBNET Centre and the INDEST-AICTE Consortium, IIT Delhi. The N-LIST project provides access to e-resources to students, researchers and faculty from colleges and other beneficiary institutions through server(s) installed at the INFLIBNET Centre. The authorized users from colleges can access e-resources and download articles required by them directly from the publisher's website



INDEST-AICTE Consortium & UGC-INFONET Digital Library Consortium jointly executed N-LIST Consortium

As on December 02, 2013, a total number of 3,527 colleges have registered themselves with the N-LIST programme including 12B/2F colleges and non-aided colleges. This programme is available for 12B/2F general degree colleges and non-aided colleges, except the colleges of Agriculture, Engineering, Management, Medical, Pharmacy, Dentistry and Nursing. The registered eligible colleges are required to pay Rs. 5,000/- (Rupees Five Thousand) only as annual membership fee. The N-LIST Programme subscribes the following e-resources for the colleges.



Website of N-LIST Consortium

- **E-Journals (Fulltext):**

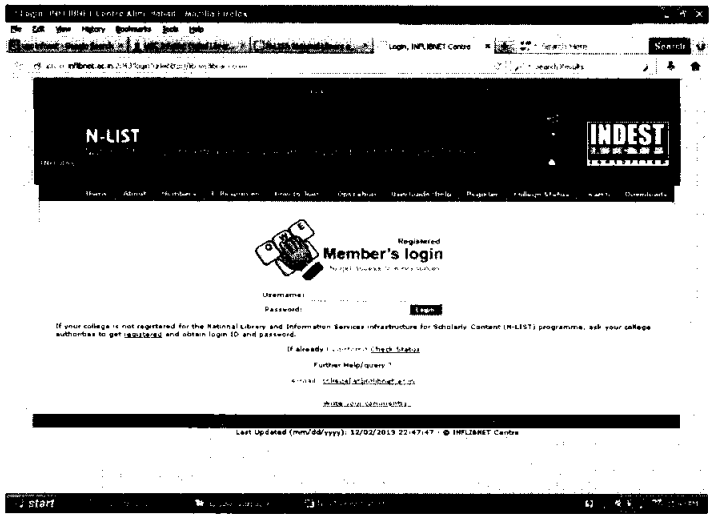
1. American Institute of Physics (18 titles)	http://journals.aip.org/
2. American Physical Society (10 titles)	http://publish.aps.org/browse.html
3. Annual Reviews (33 titles)	http://arjournals.annualreviews.org
4. Cambridge University Press (224 titles)	http://journals.cambridge.org/
5. Economic and Political Weekly (1 title)	http://www.epw.in/
6. Indian Journals (150 titles)	http://www.indianjournals.com/
7. Institute of Physics (46 titles)	http://www.iop.org/EJ/
8. JSTOR (2000 titles)	http://www.jstor.org/
9. Oxford University Press (206 titles)	http://www.oxfordjournals.org
10. Royal Society of Chemistry (29 titles)	http://www.rsc.org/Publishing/Journals/
11. H.W. Wilson (1420 titles)	http://vnweb.hwwilsonweb.com/hww/

- **E-Books:**

1. Cambridge Books Online (1800 titles)	http://ebooks.cambridge.org
2. E-brary (83000 + titles)	http://site.ebrary.com/lib/inflibnet
3. EBSCoHost-Net Library (936 titles)	http://www.netlibrary.com
4. Hindustan Book Agency (65+ titles)	http://hindustan.igpublish.com
5. Institute of South East Asian Studies Books (382+ titles)	http://iseas.igpublish.com
6. Oxford Scholarship (1402+ titles)	http://www.oxfordscholarship.com
7. Springer eBooks (2300 titles)	http://www.springerlink.com
8. Sage Publication eBooks (1000 titles)	http://knowledge.sagepub.com
9. Taylor Francis eBooks (1800 titles)	http://www.tandfebooks.com
10. Myilibrary-McGraw Hill (1124 titles)	http://lib.myilibrary.com/

- **Bibliographic Database:**

1. MathSciNet http://www.ams.org/mathscinet/



Member's Login Window of N-LIST

5. General Degree College Libraries under Vidyasagar University:

The state of West Bengal stands out prominently on the map of general education in Eastern India due to large number of institutions imparting general education. There are forty one (41) general degree colleges under Vidyasagar University situated in the districts of Purba and Paschim Medinipur of West Bengal. We are now living in the age of information explosion and ICT is knocking regularly to the door of every individual. It is highly expected that all the colleges should have their own website. But the survey reveals that out of 41 colleges, only 30 colleges have their own websites, i.e., 73.17% colleges have their websites. The name of the colleges and their website address are hereby annexed in the last.

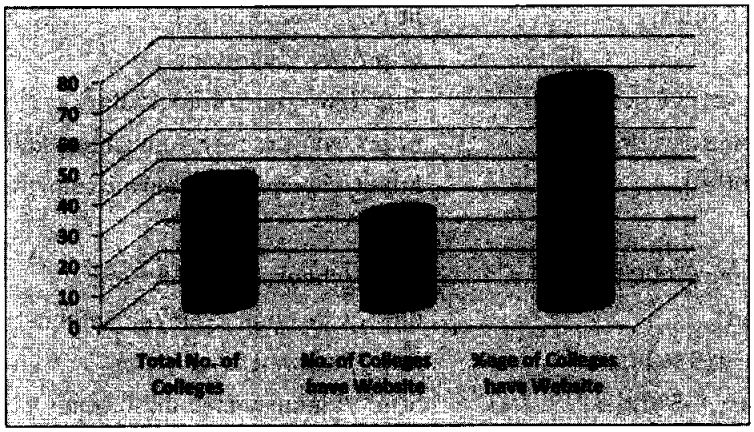


Chart Showing Number & Percentage of Colleges have Website

6. N-LIST Registration of General Degree College Libraries under Vidyasagar University:

Out of 41, only 18 General Degree College Libraries have the registered in the N-LIST Consortium. It seems from the web-based survey that only 43.9% of General Degree College Libraries have the registration of the said consortium which is not a good sign for general education and research.

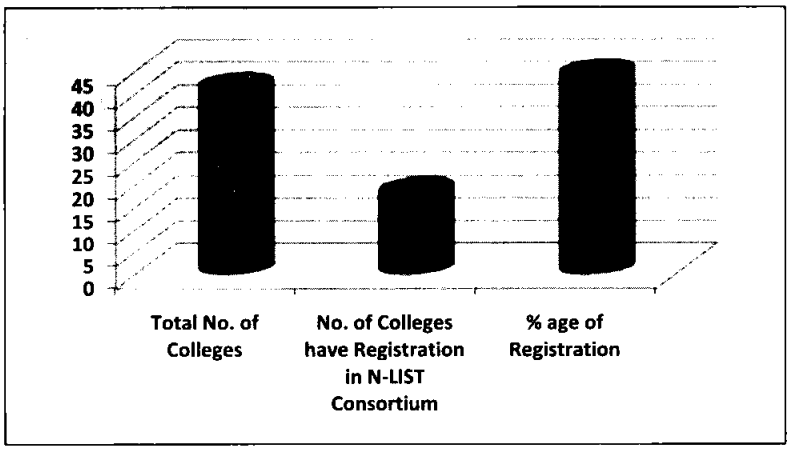
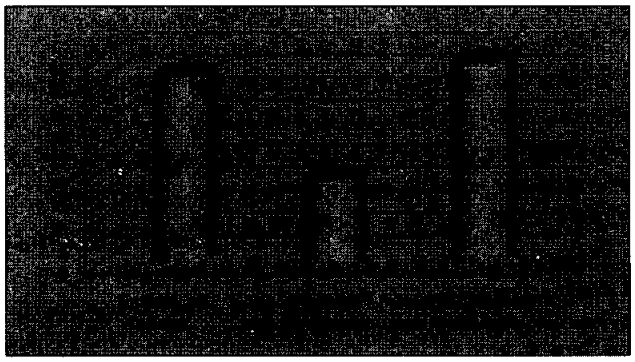


Chart Showing No. & Percentage of Colleges has Registration in N-LIST Consortium

7. N-LIST Membership of General Degree College Libraries under Vidyasagar University:

The survey reveals that out of 41 colleges, only 18 colleges have paid Rs. 5,000/- as annual membership fee and they have enabling the access of e-resources of N-LIST Consortium, which is very poor (43.9%).



N-LIST Membership of the Colleges

Further, it seems from the study that out of 18 colleges, 11 colleges have taken membership in the year 2010, 4 colleges in 2011, 1 college in 2012 and 2 colleges in 2013.

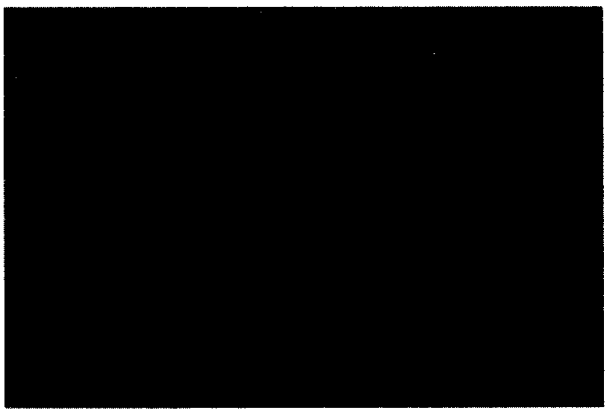


Diagram showing Year wise Membership of N-LIST

8. Recognition of Library Professionals as Administrative/ Technical Contact Persons:

55.55% of the General Degree Colleges gave the name of library professionals as Technical Contact Persons to the N-LIST Consortium and recognized them as important personalities for maintenance of the electronic resources provided by the consortium. Out of 18 member colleges, 10 library professionals are Technical Contact persons.



Recognition of Library Professionals

9. Conclusion

Finally, we may conclude that majorities (73.17%) of General Degree Colleges under Vidyasagar University have their own Website, only 43.9% College Libraries have registered and taken membership of N-LIST Consortium, all the colleges have taken membership in the recent past and 55.55% Library Professionals have recognition as Technical Contact Persons of the Member Colleges. From the survey results it reveals that the colleges should take more initiative for the membership of N-LIST Consortium to serve better in future. Last but not the least, library professionals should require more and more recognition from the college authority to enhance the education and research in a right direction.

Acknowledgement: I'd like to express my sincere thanks to Dr. Subarna K. Das, Dept. of Library & Information Science, Jadavpur University for his constant inspiration. I also extend my gratitude to Prof. Sutapa Ghosh, Teacher-in-Charge, Seva Bharati Mahavidyalaya for her kind permission to attend the conference.

References:

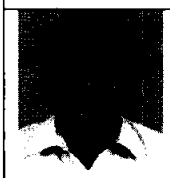
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4. http://www.inflibnet.ac.in (visited on December 03, 2013)
5. http://www.inflibnet.ac.in/econ/ (visited on December 02, 2013)
6. http://www.inflibnet.ac.in/infonet/ (visited on December 03, 2013)
7. http://www.ugc.ac.in (visited on December 02, 2013)
8. http://www.vidyasagar.ac.in (visited on December 01, 2013)
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ANNEXURE - $ => N-List Member

Sl. No.	Name of the Colleges	Website Address
1. $	Bajkul Milani Mahavidyalaya	www.bajkulcollege.org
2.	Belda College	www.beldacollege.org.in
3. $	Bhatter College	www.bhattercollege.ac.in
4.	Egra Sarada Sashi Bhusan College	www.egrassbcollege.org.in
5. $	Garhbeta College	www.garhbetacollege.com
6. $	Jhargram Raj Colege	www.jhargramrajcollege.org
7. $	K D College of Commerce	www.kdcollege.ac.in
8.	Kharagpur College	www.kharagpurcollege.ac.in
9. $	Mahisadal Girls' College	mahishadalgirlscollegewb.in
10. $	Mahisadal Raj College	www.mahishadalraj.com
11. $	Midnapore College	www.midnaporecollege.org
12.	Moyna College	*Not Available*
13. $	Mugberia Gangadhar Mahavidyalaya	mgmahavidyalaya.org
14.	Narajole Raj College	*Not Available*
15. $	Panskura Banamali College	panskurabanamalicollege.org
16.	Pingla Thana Mahavidyalaya	www.pinglacollege.org
17. $	Prabhat Kumar College	pkcollegecontai.ac.in
18. $	Rabindra Satabarshiki Mahavidyalaya	*Not Available*
19. $	Raja N.L.Khan Mahavidyalaya	*Not Available*
20.	Ramnagar College	www.ramnagarcollege.org
21.	Sabang Sajani Kanta Mahavidyalaya	www.sabangcollege.com

22.	Seva Bharati Mahavidyalaya	www.sbmahavidyalaya.org
23.	Silda Chandra Sekhar College	*Not Available*
24.	Sitananda College	www.sitanandacollege.com
25. $	Tamralipta Mahavidyalaya	www.tamraliptamahavidyalaya.org
26. $	Vivekananda Mission Mahavidyalaya	www.vmmahavidyalaya.in
27. $	Vivekananda Satabarshiki Mahavidyalaya	vsm.org.in
28.	Yogada Satsang Palpara Mahavidyalaya	www.yspm.org
29.	Chandrakona Vidyasagar Mahavidyalaya	www.chandrakonavm.org
30.	Subarnarekha Mahavidyalaya	www.subarnarekhacollege.org
31.	Haldia Government College	*Not Available*
32.	Hijli College	hijlicolleg.org
33.	Khejuri College	*Not Available*
34.	Sukumar Sengupta Mahavidyalaya	www.ssmahavidyalya.org
35.	Santal Bidroha Satabarshiki Mahavidyalaya	sbssm.org.in
36. $	Debra Thana Sahid Kshudiram Smriti Mahavidyalaya	www.debrathanacollege.in
37.	Chipat S.P.B. Mahavidyalaya	*Not Available*
38.	Maharaja Nandakumar Mahavidyalaya	*Not Available*
39.	Sankrail A. B. Smriti Mahavidyalaya	*Not Available*
40. $	Gourav Guin Memorial College	ggmc.org.in
41.	Deshapran Mahavidyalaya	*Not Available*

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Planning and Management of Electronic Libraries: *Its Challenges and Opportunities*

Surabhi Jolly Grover **Nyima Lhamo**



This article is a practical discussion of developing and implementing a collection plan for building a Electronic library; we will discuss considerations that will form the focus of your collection building activities such as patron information needs, service levels and patron expectations. We will also discuss starting points in terms of where and how to find, identify, evaluate and select appropriate electronic information resources. This article focuses on electronic information resources rather than other electronic information resources such as CD-ROM or fee-based databases that have been discussed extensively in recent literature.



Digital libraries, Architecture, Electronic collection, Digitization and Preservation

1. Introduction

Building an e-library may be the most important thing a library ever does. An important role for librarians in all types of libraries is the planning building of e-libraries. Offers a practical discussion of developing and implementing a collection plan for building e-libraries. The starting point for developing any collection plan is an assessment of the function of and need for an information collection and the audience it will serve. Let us discuss some guidelines and practical strategies on where and how to find, identify, evaluate and select appropriate electronic information resources. Focuses on electronic information resources rather than other resources such as CD-ROM or free-based databases that have been discussed extensively in recent literature.

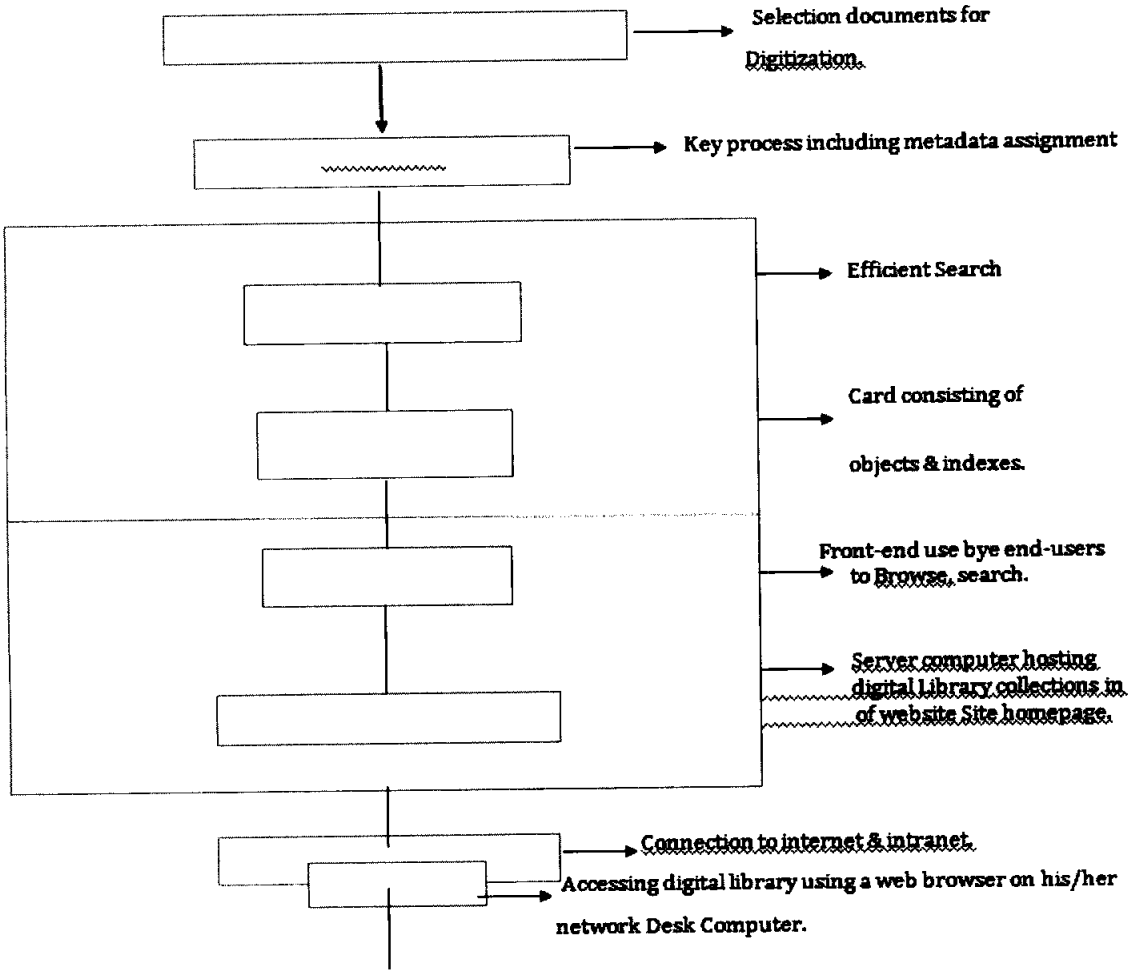
Today, being a librarian means expanding the range of resources that we provide for our patrons to include those available in electronic format, especially electronic information resources. The general pattern of our professional activities remains recognizably similar to what it has been for the last half century and more. Librarians still evaluate information resources, connect patrons to the information they need, and organize information for easier access by our patrons. With the advent of electronic resources, we are finding that our role as information intermediaries demands a new sub-set of quasi-technical skills and awareness.

Librarians must not only identify access to electronic information resources; we also must educate library patrons about how to access them and when to use them. For the most part, the writings on collection development of electronic resources have focused on the theoretical, or the philosophical issues rather than describing the actual process of locating and selecting electronic resources.

2. Functions E-library/Digital Library

- The library would allow learner to use electronic resource from anywhere without even knowing where it is stored graphically.
- Any number of users could view once copy of the documents simultaneously.
- It can be used for increasing course delivery for a large number of client's particular point of time
- Study materials need never go out of print and new editions can easily be created. Once can carry several titles at once on a portable reader and over time build a personal library.
- It would be easy for non-specialist to use due to the simplicity online and on demand enrolment, study and examination.
- Search result will be delivered to an e-mail box to the user's choice.
- Protection rare books that are rapidly deteriorating due to over use and poor storage condition.

- It is cost effective and cost efficient for its ability of reuse.
- The use of multimedia and the knowledge for the navigator permit the delivery of national and international information to users at their desktop. In this kind of environment, printed information sources such as books, journal and archival materials cannot meet a highly competitive technology. The digital information sources become essential.
- Digital libraries offer many advantage they are not free from certain problems. It contain information collected predominantly in digital or electronic form. Electronic publication had some special problems of management as compared to printed documents. It include infrastructure, acceptability. Access restrictions, readability, standardization, preservation, copyright, user interface, authentication and etc. (http://www.e-library.com)



3. Steps to create an e-library collection plan

The defining characteristics of an e-library should reflect the librarians' or information professionals' expertise in identifying, selecting and evaluating information based on an in-depth knowledge of the patron's needs and currently available resources. The unique and inspiring tradition of making resources freely available over the Internet adds unusual challenges and freedoms to providing intellectual access to them via Web guides or compilations of links. This freedom involves librarians being able to choose a variety of Internet resources we think are appropriate for our collections, unconstrained by budgets. The challenge is to sift through masses of information to locate and identify quality resources.

It is important to remember, more so in the Web-based environment than others, that including materials in an e-library collection means an endorsement, a recommendation and an approval. Although this is technically true of all our collection development activities, because most of us will craft our e-library collections from the ground up, our much-awaited efforts will usually be highly visible (figuratively, and often, politically). A small, but carefully conceived e-library collection can be an information center's public relations dream solution; a large collection organized poorly can be a nightmare for patrons and maintainers on every level. Potential problems can be avoided by developing and following a thoughtful e-library collection plan. By having a clear understanding of what is involved to create an e-library, you can maximize opportunities to educate management decision makers as well as your users about the process and its possibilities. Our recommended steps are:

- Step 1. Determine the purpose of your Electronic library.
- Step 2. Develop a collection development plan.
- Step 3. Collect, evaluate and select resources for your Electronic library collection.
- Step 4. Design, create and maintain your Web-based e-library collection Web site.

4. What are the Issues and Challenges in Electronic Libraries?

The optimism and hype from the early 1990's has been replaced by a realization that building digital libraries will be a difficult, expensive, and long-term effort. Creating effective digital libraries poses serious challenges. The integration of digital media into traditional collections will not be straightforward, like previous new media (e.g., video and audio tapes), because of the unique nature of digital information--it is less fixed, easily copied, and remotely accessible by multiple users simultaneously. Some of the more serious issues facing the development of digital libraries are outlined below.

- Technical Architecture
- Building Electronic Collection
- Digitization
- Metadata
- Copyright Management
- Preservation

- **Technical architecture:** The first issue is that of the technical architecture that underlies any digital library system. Libraries will need to enhance and upgrade current technical architectures to accommodate digital materials. The architecture will include components such as:
  - high-speed local networks and fast connections to the Internet
  - relational databases that support a variety of digital formats
  - full text search engines to index and provide access to resources
  - a variety of servers, such as Web servers and FTP (File Transfer Protocol) servers
  - electronic document management functions that will aid in the overall management of digital resources
- One important thing to point out about technical architectures for digital libraries is that they won't be monolithic systems like the turn-key, single box OPAC's with which librarians are most familiar. Instead, they will be a collection of disparate systems and resources connected through a network, and integrated within one interface, most likely a Web interface or one of its descendants. For example, the resources supported by the architecture could include:
  - bibliographic databases that point to both paper and digital materials
  - indexes and finding tools
  - collections of pointers to Internet resources

- directories
- primary materials in various digital formats
- photographs
- numerical data sets
- and electronic journals

- **Building electronic collections:** One of the largest issues in creating electronic libraries will be the building of electronic collections. Obviously, for any electronic library to be viable, it must eventually have a electronic collection with the critical mass to make it truly useful. There are essentially three methods of building digital collections:

  - Digitization, converting paper and other media in existing collections to digital form (discussed in more detail below).
  - Acquisition of original digital works created by publishers and scholars. Example items would be electronic books, journals, and datasets.
  - Access to external materials not held in-house by providing pointers to Web sites, other library collections, or publishers' services.

  While the third method may not exactly constitute part of a local collection, it is still a method of increasing the materials available to local users. One of main issues here is the degree to which libraries will digitize existing materials and acquire original digital works, as opposed to simply pointing to them externally. This a reprise of the old access versus ownership issue--but in the digital realm--with many of the same concerns such as:

  - local control of collections
  - long-term access and preservation

5. Digitization

Recall that one of the primary methods of digital collection building is digitization. What does this term mean exactly? Simply put, it is the conversion of any fixed or analogue media--such as books, journal articles, photos, paintings, microforms--into electronic form through scanning, sampling, or in fact even re-keying. An obvious obstacle to digitization is that it is very expensive. One estimate from the University of Michigan at Ann Arbor, the organization responsible for the JSTOR project, puts the cost of digitizing a single page at $2 to $6 dollars US.

How do you go about deciding what parts of a collection to digitize? There are several approaches available, at least theoretically:

- **Retrospective conversion of collections**-essentially, starting at A and ending up a Z. However ideal such complete conversion would be, it is impractical or impossible technically, legally, and economically. This approach can arguably be dispensed with as a pipe dream.
- **Digitization of a particular special collection or a portion of one.** A small collection of manageable size, and which is highly valued, is a prime candidate.
- **Highlight a diverse collection** by digitizing particularly good examples of some collection strength
- **High-use materials**, making those materials that are in most demand more accessible.
- **An *ad hoc* approach** where one digitizes and stores materials as they are requested. This is, however, a haphazard method of digital collection building.

6. Metadata

Metadata is another issue central to the development of digital libraries. Metadata is the data describes the content and attributes of any particular item in a digital library. It is a concept familiar to librarians because it is one of the primary things that librarians do they create cataloguing records that describe documents. Metadata is important in digital libraries because it is the key to resource discovery and use of any document. Anyone who has used Alta Vista, Excite, or any of the other search engines on the Internet knows that simple full-text searches don't scale in a large network. One can get thousands of hits, but most of them will be irrelevant. While there are formal library standards for metadata, namely AACR, such records are very time-consuming to create and require specially trained personnel. Human cataloguing, though superior, is just too labour extensive for the already large and rapidly expanding information environment. Thus, simpler schemes for metadata are being proposed as solution.

While they are still in their infancy, a number of schemes have emerged, the most prominent of which is the Dublin Core, an effort to try and determine the "core" elements needed to describe materials. The first workshop took place at OCLC headquarters in Dublin, Ohio, hence the name "Dublin Core". The Dublin Core workshops defined a set of fifteen metadata elements—much simpler than those used in traditional library cataloguing. They were designed to be simple enough to be used authors, but at the same time, descriptive enough to be useful in resource discovery.

7. Copyright / Rights management

Copyright has been called the "single most vexing barrier to digital library development". The current paper-based concept of copyright breaks down in the digital environment because the control of copies is lost. Digital objects are less fixed, easily copied, and remotely accessible by multiple users simultaneously. The problem for libraries is that, unlike private businesses or publishers that own their information, libraries are, for the most part, simply caretakers of information—they don't own the copyright of the material they hold. It is unlikely that libraries will ever be able to freely digitize and provide access to the copyrighted materials in their collections. Instead, they will have to develop mechanisms for managing copyright, mechanisms that allow them to provide information without violating copyright, called rights management.

Some rights management functions could include, for example:

- Usage tracking
- Identifying and authenticating users
- Providing the copyright status of each digital object, and the restrictions on its use or the fees associated with it
- Handling transaction with users by allowing only so many copies to be accessed, or by charging them for a copy, or by passing the request on to a publisher.

8. Preservation

Another important issue is preservation--keeping digital information available in perpetuity. In the preservation of digital materials, the real issue is technical obsolescence. Technical obsolescence in the digital age is like the deterioration of paper in the paper age. Libraries in the pre-digital era had to worry about climate control and the de-acidification of books, but the preservation of digital information will mean constantly coming up with new technical solutions. When considering digital materials, there are three types of "preservation" one can refer to:

- **The preservation of the storage medium** Tapes, hard drives, and floppy discs have a very short life span when considered in terms of obsolescence. The data on them can be refreshed, keeping the bits valid, but refreshing is only effective as long as the media are still current. The

media used to store digital materials become obsolete in anywhere from two to five years before they are replaced by better technology. Over the long term, materials stored on older media could be lost because there will no longer have the hardware or software to read them. Thus, libraries will have to keep moving digital information from storage medium to storage medium.

- **The preservation of access to content**. This form of preservation involves preserving access to the *content* of documents, regardless of their format. While files can be moved from one physical storage medium to another, what happens when the formats (e.g., Adobe Acrobat PDF) containing the information become obsolete? This is a problem perhaps bigger than that of obsolete storage technologies. One solution is to do data migration--that is, translate data from one format to another preserving the ability of users to retrieve and display the information content. However, there are difficulties here too-data migration is costly, there are as yet no standards for data migration, and distortion or information loss is inevitably introduced every time data is migrated from format to format.
- **The preservation of fixed-media materials through digital technology**. This slant on the issue involves the use of digital technology as a replacement for current preservation media, such as microforms. Again, there are, as yet, no common standards for the use of digital media as a preservation medium and it is unclear whether digital media are as yet up to the task of long-term preservation. Digital preservation standards will be required to consistently store and share materials preserved digitally (Chepesuik, 1997).

9. Conclusion

Libraries around the world have been working on this daunting set of challenges for several years now. They have created many digital library initiatives and projects, and have formed various national schemes for jointly exploring key issues. With several years' accumulated experience, the initial enthusiasm surrounding the development of the digital library has been replaced by sober second thought. Librarians have discovered that, with a few exceptions, making a business case for digitization and investments in digital technology is more difficult than first envisioned, especially given the technical and legal constraints that must first be overcome. As with most other technical developments in libraries over the years, we will have to move forward in small, manageable, evolutionary steps, rather than in a rapid revolutionary manner.

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Significance of Marketing Research and Plan for Promotion of Library Products and Services

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The ultimate purpose of the marketing concept is to help organisations achieve the objectives and information marketing will helps to achieve the library and information center's objectives. Proper understanding of user's needs, wants and demands is more essential in design and development of new product or services through periodic marketing research/surveys and accordingly one can prepare the plan for information marketing. In this paper the authors narrated the some basic ideas for marketing research and plan for promotion of library products and services.



Marketing of information, Market research, Market plan, Mission statement.

1. Introduction

Marketing is the analysis, planning, implementation and control of carefully formulated programmes designed to bring about voluntary exchange of values with target markets for the purpose of achieving organisations objectives. It rely heavily on designing the organisation's offering in pricing, communication and distribution to inform, motivate and service the markets.

The approach to Information products and services is now being evolved into an Information industry especially the products like Information databases. The online information retrieval systems of 1970s and 1980s are the set examples of information industry which consisted of database producers or generators, database service provides or vendors. The BRS, DIALOG were the examples which were providing value added networked information services. The OECD expresses marketing of information into several Information occupations and organization and has recognized 284 units and 1506 occupations and samples are: a) Information producers b) Information Providers c) Information distributors and d) Information Infrastructure.

2. Market Mix

The market mix is a marketing instrument that a step in planning and it involves to develop specific strategies that will provide a "road map" to reach your goals and objectives. The popular classifications of Marketing Mix are FOUR Ps:

- **Product:** It includes both, Products and services, but they differ. Products can be inventoried but service cannot. The service cannot be seen, felt, smell or taste, before its use. Services cannot be separated from their providers. So the first P include all of the features of product and service.
- **Price:** Price goes by many names, but in the end all organizations must set prices on their products and services. Determining the actual costs involved in any new products or service is the first step in pricing the service. There are varieties of pricing models used in market plans.
- **Place:** In marketing, place in not just the physical location of the library and its branches. Place is the in a way where you deliver the service or product. The digital market place has also changed the concept of place dramatically. Place now encompasses the distribution channels and may include electronic document delivery and online catalogues (OAPC). Document delivery inter and intra library loan programs are also the examples of place where the services and products are delivered.
- **Promotion:** Promotion strategies include all of the persuasive communication programmes frequently associated with marketing. Public relations, sales promotions, incentives, advertising

Websites and electronic media all become a part of the promotion strategy. Libraries are now recognizing that they must promote their products and services because they are operating in a competitive and sophisticated environment and must be visible as other cultural and educational institutions.

3. Market Research

A basic role for a marketing researcher is that of intermediary between the producer of a product and the marketplace. The marketing researcher facilitates the flow of information from the market or customer to the producer of the good or service. Such a situation, with three major players—the producer (libraries), the customer or user and the market researcher (insider or outsider). According to the **American Marketing Association (AMA)**, "Marketing research is the systematic gathering, recording, and analyzing of data about problems relating to the marketing of goods and services."

- Marketing Research is Systematic and Objective search for and analysis of information relevant to the identification and solution of any problem in the field of marketing.
- Marketing Research is useful for improving marketing decisions and understanding of marketing phenomena in any marketing situation. It is especially useful for marketing of library and information products and services.

4. Before Conducting Marketing Research

Every library manager must ask the following questions to devise effective marketing research:

- Who are my users and potential users?
- Where do they live?
- Can and will they Receive product or service?
- Am I offering the kinds of goods or services they want - at the best place, at the best time and in the right price?
- Are my promotional programmes working?
- What do users think of my library/library staff activities?
- How does my activities compare with my competitors?
- **How to do it?**
  - Step One : Define Marketing Problem and Opportunities
  - Step Two : Set Objectives, Budget, and Timetables
  - Step Three : Select Research Types, Methods, and Techniques
  - Step Four : Design Research Instruments
  - Step Five : Collect Data
  - Step Six : Organize and Analyze the Data
  - Step Seven : Present and Use Market Research Findings

- **Step One: Define Marketing Problem and Opportunities:** Library marketing problem is very from library to library and situation to situation. Therefore Librarian need to be conduct environmental and system analysis.
  - The root cause of the problem is harder to identify than its obvious manifestations; for example: Decline in Library transaction is a problem, but its underlying cause is what must be corrected.
  - It may be that current knowledge supports one or Development of hypotheses.
  - Gather additional information before considering surveys or field experiments, look at currently held information:

- Transaction records, complaints, and any other records that can show where users attached and work, and how and what they use.

- **Step Two: Set Objectives, Budget, and Timeline:** The objectives are guiding principles library and Information centers. Every library need to be work with certain objective and at the same time the objectives should be achievable through work.

  Some Examples:

  - To provide library resources, services and facilities which support the undergraduate, Post-graduate and research programmes of Bangalore University.
  - To provide access for Bangalore University faculty, staff and students to library and information resources that extends beyond local resources and services.
  - To contribute to the academic success, growth and development of students through teaching and promoting information literacy.

  - **Budget:** Budget is a part of market research. The budget amount can be utilized for conducting surveys and preparation of data collection tool.
    - How much money are you willing to invest in your market research?
    - Your market research budget is a portion of your overall marketing budget.
  - **Timeframe:** It is better fix the time every beginning of the academic year.
    - Prepare a detailed, realistic time frame to complete all steps of the market research process.

- **Step Three: Select Research Types, Methods and Techniques:** A survey method can be adopted and questionnaire or interview schedule may be employed for primary data collection. Primary research or original information gathered for a specific purpose and secondary research or information that already exists somewhere.
  - Both types of research have a number of features and methods of conducting associated with them.
  - Secondary research is usually faster and less expensive to obtain that primary research.
  - Gathering secondary research may be as simple as making a trip to your local library or information center or browsing the Internet.

- **Step Four: Design Research Instruments:** Keep these tips in mind when designing your market research survey/questionnaire.
  - Keep it simple and easy to read;
  - Include instructions for answering all questions included on the survey;
  - Begin the survey with general questions and move towards more specific questions;
  - Keep each question brief;
  - If the questionnaire is completed by the respondent and not by an interviewer or survey staff member;
  - Remember to pre-test the questionnaire;
  - Mix the form of the questions like open ended and closed endded.

- **Step Five: Collect Data**
  - Collect the data under the direction of experienced researchers or library staff.
  - Before beginning the collection of data, it is important to train, educate and supervise your research or library staff.
  - An untrained staff person conducting primary research will lead to interviewer bias.

- **Step Six : Organize and Analyze Data**
  - Once your data has been collected, it needs to be "cleaned."
  - Cleaning research data involves editing, coding and the tabulating results.
  - To make this step easier, start with a simply designed research instrument or questionnaire.
- **Step Seven : Present and Use Marketing Research Findings:**
  - Once marketing information about your target market, competition and environment is collected and analyzed, present it in an organized manner to the decision makers of the Library & Information Centre.
  - The resulting data was created to help guide your library decisions, so it needs to be readily accessible to the decision makers.

5. Employing ICT to conduct Market Research

The ICTs plays a pivotal role for smooth and timely conducting Market research. It helps to conduct local, regional, national and international level, where the users are dispersed with different geographic region.

- Technology can be used to extract data from transaction log (of online content and OPAC searches),
- Circulation records, as well as online user surveys and feedback.
- Further analysis of the data can lead to a study of user behavioural patterns or trends.
- To certain extent, the use of Customer Relationship Management software is employed to help market library services and products to the users, especially for those fee-based services.

Marketing research is not a perfect science. It deals with users and their constantly changing feelings and behaviors, which are influenced by countless subjective factors. The purpose of market research is to understand the market and demand for services. Library staff regularly discusses the environment in which they operate and the place they need to reach. Annual user surveys and weekly user care meetings give an opportunity to share the experience of the frontline staff. Other tools for market research are the fixing suggestion boxes and floor walking.

6. Market Plan

A good marketing plan begins with a mission statement that defines the objectives of the library or the information centre, which includes an identification of the target market segments.

- **Objectives of Academic Libraries :**
  - Assist the users in getting formal education
  - To meet the curricular needs of the users
  - To promote research activities and publications
  - To improve the educational quality and standards
  - To disseminate knowledge for effective utilization of all types of resources & services

7. Steps for Creating the Marketing Plan

- **Prepare a Mission Statement:** The mission statement clearly and succinctly describes the nature of the library activities, services offered, and markets served usually in a few sentences. Sometimes for larger libraries it's combined with a vision statement that can be two to three paragraphs in length. For example in a University library situation 'Mission Statement may be prepared as follows: "To Support the University's Mission to Achieve Excellence in the Scholarly Activities of Teaching, Discovering, Preserving and Applying Knowledge "

- **List and Describe Target or Niche Markets**
    - In this section, list and describe potential groups of users or clients.
    - After you create the list, identify various segments of a market.
    - Segments can include specific types of users in a library by role.
        - For example in a University Library, UG, PG, teaching and non-teaching staff, Officer's of the University, and other.
- **Describe Your Services**
    - Inventory the services you currently offer and identify new services you wish to provide.
    - Determine what it will take to provide these services in terms of staff, expertise, and costs.
- **Spell Out Promotional Strategies**
    - Network - either in person or electronically.
    - Direct marketing
    - Devise training programs that increase awareness about your services.
    - Write articles for local media or professional journals and newsletters that describe the benefits of your services.
    - Send out publicity and press releases through local newspapers, radio, and television stations.
    - Participate in trade shows at the local or regional level.
- **Identify and Understand the Competition**
    - As part of the market planning process, you must learn about your competitors and how to position yourself in relation to them.
    - Describe your strengths and what you want to emphasize.
    - Once you identify both direct and indirect competition
    - You can determine how and why your services are special and benefit users in a particular way.
- **Establish Marketing Goals that are Quantifiable:** Marketing goals can include setting the number of new clients you would like to acquire; the number of people you would like to reach; the amount of income you would like to generate
- **Monitor Your Results Carefully:** By monitoring results, you determine which of your marketing strategies are working and which are not. Identify strategies that generate leads to maximization of users satisfaction.

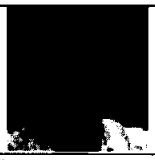
This involves tracking and evaluating customers' responses to each marketing strategy.

8. Conclusion

Any successful library and information center must have knowledge about prospective or current clients and must implement a marketing research and plan that is regularly revised. Unlike the longer-term strategic planning documents, marketing plans in libraries should be revised annually, like a annual budget, and should reflect changes and revised goals based on the previous year's experience. The regular and periodic marketing research and plan is an important tool for making your library victorious in this age of change, where working smarter is necessary to achieve your desired results.

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Students view on Library in ICT Environment: *a study of Datta Meghe Institute of Medical Science, Sawangi (M), District Wardha, Maharashtra*

Milind B. Ghangare

Abstract

This study was undertaken to observe the students view on library resources. ICT facilities/services, and their use of library of Datta Meghe Institute of Medical Science sawangi (M) Dist. Wardha. The result from this study will be useful to enhance the collection development and to implement innovative services to meet student's needs more effectively. This will also provide an answer to how which and where the library can improve the ICT facilities. Questionnaires were used for this study. The survey was conducted between August and Sept. 2013. The survey was sent randomly at 95 students of all courses and 80 students were responded. This paper established the importance of a ICT products and services understanding the students information needs, view on library services in different years of their studies.

Library use, library resources, student's information needs, college library, ICT facilities.

1. Introduction

Libraries are the nerve centre of any academic or research institution and the massive advancements in ICT have provided the libraries new opportunities to deliver their services in a better, faster, user centric way in a 24x7 time format and at the doorstep of the user. It is clear that the new information technology will bring users new information seeking patterns. In order to develop better collections and services to meet user's new expectations, the understanding of users information needs is the key to it. ICT is often perceived as a catalyst for change, in a teaching style. And change is learning approaches and in access to information. The World Wide Web, multimedia and internet based applications, cheaper, reliable and powerful computers have made easier the task of satisfying the needs of library user sitting in any corner of the world.

This study is informed by the need to carry out a research which focuses on college libraries as there has been no study on students view in D M Institute of Medical Sciences College about computer, Internet and library services in changing ICT environment. The study was also restructured to explore on the information needs of the students. This would assist teachers to know t heir students better. It also a service guide for D.M. Institute of Medical sciences. College library in developing ICT infrastructure.

2. Methodology

The present study was conducted on the libraries on Datta Meghe Institute of Sawangi (M) in the Dist. of Wardha the state of Maharashtra, India. The sample population under the present study is comprised of college students from the D.M. Institute of M.S. The sample of the population was selected by random sampling method. The primary data was collected by means of survey instrument for which a questionnaire was designed to achieve the objectives of this study. The questionnaire was distributed among students of the different course of medical science. The investigator personality visited the college for the distribution of questionnaires and for making a better understanding of the questionnaires to the sample population and also to get first – hand information about the libraries and the college to satisfy the objectives of the study. The survey was conducted between August and Sept. 2013.

3. **Objective of the study:** In this study, the main aim is to find out students view and whether students make the optimum use of library services, resources and facilities. The objectives of the study are as follows:

- Discover the level of experience in computer operations.
- Find out the students acquaintance with Internet.
- Know the satisfaction of students in using college library resources.
- Know the place and frequency of use of Internet, computers by students.
- Find out the importance of computer and Internet facility in library.

4. Scope and Limitations

The study covers students from all courses and is limited to graduate students of Datta Meghe Institute of medical sciences. It does not include students of the postgraduate (P.G. level)

5. Data Analysis

This section presents the analysis of data gathered for the present study by means of a structured questionnaire which was distributed among the students in different course of D.M. Institute of Medical science sawangi (M). It was decided that students will be selected randomly irrespective of their age, gender, course of study year of their study in the college, Socio-economic and cultural back ground. Total population of sample for students comprised of 95 students and out of this the research received the response of 80 students which constitutes 84.21% the total sample population for students. The questionnaire for the students was designed primarily keeping in mind the objectives of the study and also to have a fairly good understanding of the outcomes of the responses. The questions deal with the awareness of students regarding ICT based services being provided in their libraries and about their perception of the existing infrastructure, their requirement, attitude of the library staff in solving the difficulties being faced by students while using ICT based library services. The data obtained through the questionnaires has been analyzed, interpreted, organized and tabulated under various headings as given below.

- **Personal Information:** This section deals with the personal information of students about their age, gender, and their stream of study, social background and student's compatibility with computers.

Table – 1: Age and Gender Ratio of Students

Age	Streams					
	Male					
	MBBS	BDS	BAMS	BPTH	B.SC. Nursing	Ground total
18 Years	04	02	01	01	--	08
19 Years	03	03	02	02	02	12
20 Years	01	02	03	01	03	10
21 Years	05	01	01	02	--	09
24 Years	04	02	03	01	--	10
	Female					
18 Years	02	01	01	02	04	10
19 Years	01	01	01	01	02	06
20 Years	03	--	02	--	02	07
21 Years	02	02	02	01	01	08
Above 21 Years	25	14	16	11	14	80
Total	**(31%)**	**(18%)**	**(20%)**	**(14%)**	**(18%)**	**(100%)**

Table – 1 Show the category of the respondents combined with course wise, age-wise and gender-wise. Out of total 80 (100%) respondents. 49 (61.25%) one male and 31(38.75%) female. Male and female are equally responded from BDS and B.Sc. (Nar.) 14 (18%) are equal in number M.B.B.S. course respondent are highest 25(31%), BAMS & B.P.th 16(20%) and 11(14%) respectively.

- **Frequency of Library visit:**

Table – 2: Frequency of library visit

Frequency	Students	% age
Daily	45	56.25%
Once in a week	18	22.50%
Fortnight	09	11.25%
Once in a month	03	3.75%
Others	05	6.2%5
Total	**80**	**100%**

It is observed from the table-2 that highest 45 (50.25%) number of respondents are using the library daily, followed by 18(22.50%) use library once in a week and 09 (11.25%) vist it fortnightly, 03(3.75%) visited once in a month depending on the requirements 05(6.25%) respondent use the library at a times or rarely.

- **Purpose of visit to library:** The question was asked about purpose of visit to library and the resources and facilities used by respondents. The multiple choice options were asked as the users visit the library for multiple purposes.

Table - 3: Purpose of visit

Purpose	Students	% age
Reference books	61	76.25%
Books	75	93.75%
e-books	24	30%
Video CDs	15	18.75%
News Paper	65	81.25%
Periodicals	71	88.75%
Internet Access	68	85%
Photocopy	72	90%

It is observed from the study that Table-3 reveals majority of the respondents visit library to borrow / refer books 75 (93.75%) followed with a purpose to access internet 68 (85%), Photocopy 72 (90%), purpose of visit to refer the newspaper is 65 (81.25%), for reference books 61 (76.25%), respondent visit the library. Small number 24 & 25 respondents visit the library to use the e-books and video-CDs.

- **ICT Based Library services in the libraries:**

Table - 4: ICT Based library services in the libraries

Services	Yes	No	No Response
Transactions	61(76.25%)	08(10%)	11(13.75%)
Audio/video material	15(18.25%)	65(18.75%)	--
OPAC	68(85%)	03(3.75%)	09(11.25%)
CD-ROMS	51(63.75%)	22(27.50%)	07(8.75%)
e-mail	75(93.75%)	05(6.25%)	--
Internet Surfing	73(89%)	02(2.50%)	05(6.25%)
Databases (on-line)	65(81.25%)	05(6.25%)	10(12.50%)
Fax	39(48.75%)	35(43.75%)	06(7.50%)

Although the majority of the respondents are from urban areas but the degree of awareness about the libraries providing computerized library services seems to be almost balanced and the students responded that they are aware of the fact that their college library is fully computerized.

The major facility which students one availing is of computerized issue and return of the library documents. Such respondents who responded in affirmative are 76.25% while 31% students did not provide any answer. The proportion of such student who are using OPAC is 85% and only 3.75% students said that they are not making use of OPAC. A major proportion of 11.25% respondents skipped the question for answer. A very low percentage of respondents, only 18.25% are using the audio-video material available in the library. 73% respondent admitted that they are availing the facility of Internet searching. Electronic mail which today is the most common and prevalent mode of communication is being used by 93.75% of the respondents in the library.

- **Place of Access and use of computer/Internet:**

Table - 5: Place of access and use

Place	Students	% age
Home	71	88.75%
Library	68	85.00%
Cyber café	24	30.00%
Computer lab	22	27.50%

Respondents were asked to choose suitable answers all that apply to them (more choices). Table 5 explains that 71 (88.75%) respondents use computer and access internet in home. Then given library as a second 68(85%) preferred place. Then followed by with very less respondents 24 and 22 preferred cyber café and college computer lab respectively.

- **Opinion on library (Resources, services and facilities):** For any college library, along with the good resources, services and ICT facilities the basic seating arrangement and space is also very important. This is true

in the responders view that maximum 76 responders like seating and reading space. The followed by 72(90%) like good stock of books of different kinds, 68 (85%) like newspaper magazines and 71 (88.25%) like ICT infrastructure availability and very least respondents. 45 (36.20%) like online databases and internet availability.

- **Opinion about library Management:**

Table – 6: Opinion about library management

Place	Students	% age
Worst	09	11.25
Bad	07	9.25
Good	30	37.50
Better	22	27.50
Best	12	15.00
Grand Total	80	100%

Table 6 illustrates highest 30 (37.50) number of respondents has opinion that the library management is good. Followed by 22(27.50) respondents say better, 12(15%) respondents say best. Few respondents 07(9.25) say bad and 9(11.25) say management is worst.

- **Satisfaction Level about Library:**

Table – 7: Satisfaction Level about Library

Opinion	Students	% age
Satisfied	65	81.25
Not satisfied	07	8.75
Neutral	08	10.00
Grand Total	80	100%

Table – 6 Describe the majority of respondents 65 (81.25%) were satisfied. Few respondents 7(8.75%) say not satisfied about library level. 8(10%) respondents is neutral about library satisfaction level.

6. **Major Findings of the study:** Based on the analysis of the survey the following finding can be arrived as:
   - Among all respondents 18-19 years respondents are higher in both gender group (male and female).
   - Highest 45(56.25%) respondents use the library daily, followed by 18 (22.50%) use it once in a week.
   - The majority of the respondents visit library to borrow/refer books followed with a purpose to access internet, photocopy, and refer the newspaper and for reference books.
   - More than half a respondents use computers daily followed by respondents use at least once or twice a week, it is good to see that the use of computer are more by students in their study.

7. **Suggestions:**
   - The college librarian should be a part of any decisions that are taken for the benefit of the library users. The library should teach the student 'how to search information on internet' and also the different integrated features of the browsers.
   - The library should be encouraging students to learn the latest information search skills, as well as promote the library services and resources more and more.
   - Periodic orientation and training programmes should be arranged for library users so as to make them aware of the existing library services and also to ensure their proper utilization.

8. **Conclusion**

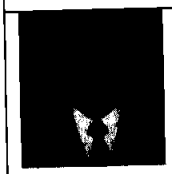
This paper data analysis and its graphical representation has now provided us a clear picture about the present level and students view on library in ICT environment. In these days the college students are flooding towards library with assignments dissertations, Information seeking and gathering is a challenging talk for the students.

The study revealed that, students used a variety of information sources and services. it is clear by the study that in this age of electronic resources, most of the students (respondents) still using books as information source for their academic purpose.

It is evident by the study that majority of the users has shown their satisfaction about Information resources and services. Internet facility and encouragement in use of electronic database should be more facilities. It proves that books are not losing their importance in the electronic/Internet age.

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Usability Evaluation of Social Science Databases among Faculty in Shivaji University, Kolhapur

Vilas G. Jadhav **Yuvraj Jadhav**

The present study is aimed at examining of databases usability by social science faculty members in Shivaji University, Kolhapur. A total of 36 faculty members from various departments from Shivaji University were selected. A questionnaire measuring use of various databases in social sciences was prepared and administered to the selected faculty. Results revealed that faculty of Shivaji University were aware about various social science databases. It was also observed that though a majority of the faculty members feel that e-databases are easy to use and have more up-to-date information than the conventional documents. Still some faculty members face problems in finding required information. In order to make these more beneficial, the library staff should provide more training to make sure that the faculty members are familiar with the databases, and able to obtain right information at the right time.

Databases usability, Electronic Databases, Social Science Databases

1. Introduction

The electronic databases have enabled the library patrons to access the information remotely and enhance their academic excellence. Today, electronic information resources have become the backbone of all academic organizations. Electronic databases are replacing papers causing difficulty in their use. The use of electronic database by faculty members depends mainly on skills of each individual to locate discrete knowledge elements. Electronic information resources help to expand access, increase usability and effectiveness and establish new ways for individuals to use information to be more productive in their endeavors. Awareness of electronic resources may aid the users in keeping abreast with current developments in their respective subject fields, in contrast with print media (Negahban and Talwar, 2009). The use of electronic databases is necessary for users mainly because it provides better, faster and easy access to information than information accessed through print media. Anybody can be relied upon electronic databases because of timely information.

2. Literature Survey

Down the time usability evaluation of databases available in the libraries have been studied and discovered by many researchers and scholars. It is a multi-dimensional concept that opens areas for research. Most of the universities provide databases to their users to support teaching, research and development.

Sujatha and Mudhol (2008) carried out a survey to study the use of different types of electronic information sources by teachers/ scientists, research scholars and post graduate students. The study reveled that 88.9% users used electronic information sources for thesis/ project work and 87.6% used for ongoing research work. Majority of the respondents comprising 79.0% browsed the Internet for subject specific information websites and 75.3% for international/ regional institution websites. Haridasan and Khan (2009) explore that the large number of social scientists are aware of the e-resources (such as e-books, e-journals, e-encyclopedias, e-theses, CD-ROM databases, e-mail, internet and the OPAC) and they use these e-resources for their research work. Many faculty members strongly agreed with the necessity for computer and internet literacy to access information and a majority of social scientists were satisfied with the e-resources available at the NASSDOC library. Calvert (2000) has evaluated the impact of electronic journals and aggregate databases on inter-library loan activities. His findings reveal that results are not significant enough to justify searching, borrowing requests in aggregate databases and changing current inter-library loan procedure for

searching request before ordering. Bates (1996) study found that most humanities scholars made little use of online databases. Scholars appreciated that the databases covered many topics, but complained about the difficulty of their search language and the lack of availability of desired resources. It is interesting to note that scholars regarded themselves as experts in their subjects and did not expect to learn anything new from the databases.

There are good reasons to evaluate the usability of social science databases such as (a) a deeper understanding of the user needs and (b) to set the stage for product improvement in order to provide a better user experience

3. Objectives of the study

- To Ascertain in The Awareness and Availability of Social Science Databases Among The Faculty Members.
- To Identify The Frequently Used Social Science Databases by The Faculty Members.
- To Determine The Purposes for Which Social Science Databases are Used by The Faculty Members
- To Find The Problems Faced by The Faculty Members in Accessing The Social Science Databases.
- To Ascertain The Level of User's Satisfaction and Recommend Appropriate Solutions Regarding the Effective Use of Available Social Science Databases

4. Research Methodology

The study covered a total of 36 social science faculty members from six departments in Shivaji University. The departments selected were Commerce and Management, Economics, History, Political Science, Sociology and Library & Information Science disciplines in Shivaji University, Kolhapur. The questionnaire method was used to elicit data on the dependency on various electronic databases by the faculty members in Shivaji University. A set of questions were formulated based on the needs and objectives of the study. The questionnaires were personally distributed to 36 members. Further, descriptive statistics were employed for analyzing the data.

5. Results

- **Use of Databases:** Table No.1 shows the use of databases, and it is note that among the 36 faculty members all faculty members are using databases.

Table No. 1 Use of Databases

User	Yes	No
Faculty Members	36(100%)	0

- **Sources through which database is known:** Figure 1. Shows that 33(29.20%) faculty members are inspired by Co-Research Scholars and colleagues, 26 (23%) followed by web and 24(21.23%) from self-instruction. About 21 (18.58%) from advertisement & only 9(7.96%) get a awareness from Library Professionals.

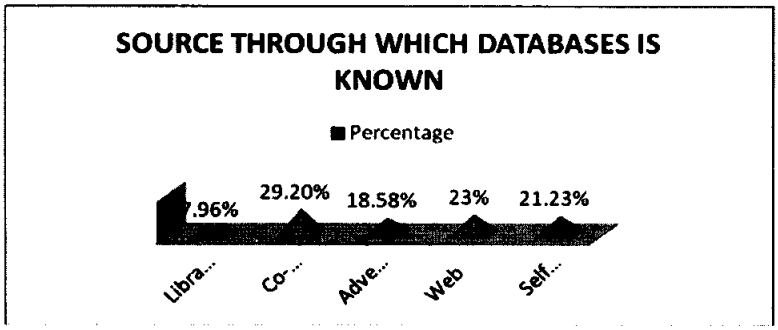


Figure 1 - Source through which databases is known

- **Frequency of use of Databases:** Table No.2 shows that the 15 (41.66%) of the respondents use database daily, the 13 (36.11%) of the respondents use database once in a week, 4(11,11%) of the respondent using database twice in a month. (11.11%) of the respondents use databases once in a month, & 2 (5.55%) faculty members use databases rarely.

Table No. 2 Frequency of Use of Databases

Sr. No.	Frequency	Respondents	Percentage
1	Daily	15	41.66%
2	Once a Week	13	36.11%
3	Twice a Month	4	11.11%
4	Once a Month	2	5.55%
5	Rarely	2	5.55%
6	Never	0	0
	Total	**36**	**100%**

- **Purpose of using databases:** Figure 2. reveals that the 27 (23.89%) faculty members use the databases for their research work. 25 (22.12 %) of the respondents use database to collecting references for lectures, 21(18.58%) for the guiding for research students, 20(17.69%) for the search of specific piece of information & for Nascent Information, 13(11.50%) for the latest developments. and 7(5.26%) are using for the writing book.

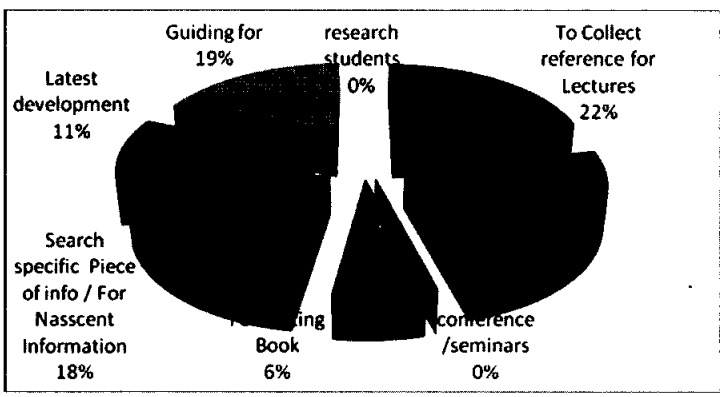


Figure 2 - Purpose of Using Databases

- **Getting access to databases:** It is observed from the table no. 3 out of the total sample surveyed, 24(29.27%) faculty members access database through Library websites and INFLIBNET websites, 22(26.83%) access though publisher websites and12(14.63%) are access Indexing and Abstracting databases.

Table 3 - Getting access to Databases

Sr	Source	A	B	C	D	E	F	Total	Percentage
1	Publisher Websites	5	4	2	1	6	4	22	(26.83%)
2	Library Websites	6	3	1	0	9	5	24	(29.27%)
3	INFLIBNET websites	5	4	2	2	8	3	24	(29.27%)
4	Ind. &Abs. Databases	4	2	0	0	5	1	12	(14.63%)
	Total	**20**	**13**	**5**	**3**	**28**	**13**	**82**	**(100%)**

- **Databases Used Mostly:** Table no 4 shows that the 20(15.74%) respondent are use Oxford University press database, 10(7.87%) respondent are use LISA database, 9(7.09%) respondent use Blackwell, 9(7.09%) respondent use Project Muse, 9(7.09%) use Economics Abstracts, 9(7.09%) use LISTA. 2(1.57%)respondent use United States Political Science Document.

Table No.4 Databases Used Mostly

Sr.	Name of Database	A	B	C	D	E	F	Total	Percentage
1.	Blackwell	3	2	0	0	4	0	9	(7.09%)
2.	Project Muse	0	2	0	1	3	3	9	(7.09%)
3.	Oxford University Press	5	3	3	1	6	2	20	(15.74%)
4.	Cambridge University Press	3	1	0	0	1	3	8	(6.29%)
5.	Taylor and Francis	0	0	0	0	2	2	4	(3.15%)
6.	AgEcon : Full text access to Agricultural Economics Literature	3	0	0	0	1	0	4	(3.15%)
7.	ERIC Databases	0	0	0	0	2	1	3	(2.16%)
8.	ISISD : Index Indian Social Science Journals	2	0	0	0	2	4	8	(6.29%)
9.	Economics Abstracts	4	2	2	0	0	1	9	(7.09%)
10.	Historical Abstracts	0	2	3	0	0	2	7	(5.51%)
11.	Insurance Abstracts	2	2	0	0	0	0	4	(3.15%)
12.	Journal of Economics Literature	4	2	0	0	0	0	6	(4.72%)
13.	Sociological Abstracts	0	4	0	2	0	2	8	(6.29%)
14.	Ulrich's International Periodicals Directory	0	0	0	0	1	2	3	(2.16%)
15.	United states Political Science Documents	0	0	0	2	0	0	2	(1.57%)
16.	Marketing & Management Abstracts	0	0	0	1	0	3	4	(3.15%)
17.	LISA	2	0	0	3	5	0	10	(7.87%)
18.	LISTA	1	0	0	1	5	2	9	(7.09%)
	Total	**29**	**20**	**8**	**11**	**32**	**27**	**127**	**(100%)**

- **Users Approach to Search:** The table no. 5 shows that the 28% are using title wise search approach for searching information, 26% users are followed subject wise search approach, 16% of respondent are using words in title approach, 14% of user are using author wise approach. 7% respondents are using series wise search approach, 6% respondents are using Boolean Search (and, or, not) wise approach. Only 3% of respondents search information through words proximity approach.

Table No.5 Users Approach to search

Sr No.	Users Approach	A	B	C	D	E	F	Total	Percentage
1	By Author	3	2	2	0	5	2	14	14%
2	By Title	5	5	2	2	10	4	28	28%
3	Words in Title	2	3	2	0	6	3	16	16%
4	Subjects	4	6	3	2	6	5	26	26%
5	Series	1	1	0	0	4	1	7	7%
6	Boolean Search	1	0	0	0	3	2	6	6%
7	Words Proximity	1	0	0	0	1	1	3	3%
	Total	**17**	**17**	**9**	**4**	**35**	**17**	**100**	**100%**

- **Opinion about Databases in Social Science:** Table No.14.Majority of respondents i.e. 16 (44.44%) respondents said that the databases are useful, 12 (33.33%) respondents said databases are highly useful and 8(22.22%) respondents responds that the databases are less useful.

Table No. 6 Opinion about Databases in Social Sciences

Sr. No	Opinion	Respondents	Percentage
1	Useful	16	44.44%
2	Highly useful	12	33.33%
3	Less useful	8	22.22%
4	Not useful	0	0
	Total	**36**	**100%**

- **Opinion about E-database as compared to Print Format:** Table No. 7 expressed that 6 (16.33%) respondents are think that the print format documents are more useful as compare to e-database under the study and 30(83.33%) of the respondents think that Print format documents are not more useful as compare to e-database.

Table No. 7 Opinion about e-database as compared to print format

Sr No	Particulars	Respondents	Percentage
1	Print format documents are more useful as compare to e-database	6	16.66%
2	Print format documents are not more useful as compare to e-database	30	83.33%
	Total	**36**	**100%**

- **Need for Orientation Program /Training Program:** It is observed from above table that 32(88.88%) respondents need of training/ orientation program for searching databases, and the remaining 4(11.11%) respondents responded that they have no need of it.

Table No. 8 Need for Orientation Program /Training Program

Sr. No.	Particulars	Respondents	Percentage
1	Need training /orientation for searching databases	32	88.88%
2	No need for any training / orientation for searching databases	4	11.11%
	Total	36	100%

- **Problems faced by Respondents :** The below table shows that the respondents are facing various problems while accessing information. The 13(26%) of respondents are facing technical problems to

access information. 10(20%) respondents have internet connectivity problems. 7(14%) respondents are facing access to websites problem, 7(14%) have a lack of relevant databases, 5(10%) are facing problem of lack of training, 4(8%) are facing power cut problem. 2(4%) respondents are facing the technical difficulties and access to websites.

Table No. 9 Problems faced by respondents while accessing the databases

Sr.No	Problems	A	B	C	D	E	F	Total	Percentage
1	Internet Connectivity	1	1	2	1	4	1	10	(20%)
2	Lack of sufficient Internet nodes in University Library	0	1	0	0	0	1	2	(4%)
3	Technical Problems	2	4	0	1	4	2	13	(26%)
4	Frequent power cut	0	1	2	0	1	0	4	(8%)
5	Lack of assistance by Library Staff	1	1	0	0	0	0	2	(4%)
6	Access to websites	1	2	0	0	2	2	7	(14%)
7	Lack of training	1	0	0	0	3	1	5	(10%)
8	Lack of relevant databases	1	1	0	1	1	3	7	(14%)
	Total	**7**	**11**	**4**	**3**	**15**	**10**	**50**	**100%**

6. Conclusion and Recommendations:

To conclude can be said say that e-databases are the major sources of information in this era of technology, and these are in good use at the university level, but still there are chances to improve the quality in using databases, and increasing number of users. More training sessions and orientations might be the answer. It is also proved in the study that most of the library users think that databases should be full text with authentic and up-to-date information, and should be easy to use. These characteristics should be kept in mind while subscribing the databases.

It is recommended that, faculty members must be trained to use the latest information resources available. Library play a key role in this regard, Workshops & awareness programs on the availability, accessibility and use of e-databases could be organized. Instructions for using the databases should be available in the library; and It is necessary that users should be intimated about the availability of e-databases for faster access of both current and back volumes, this will surely enhance the research activities of faculty members. The faculty should be informed by email when new databases are subscribed

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Usage of Digital Resources and Services by Research Scholars of Universities of ODISHA, India: *An Evaluative Study*

Prangya Das **Gopabandhu Sahu** **Rabinarayan Mohapatra**

Abstract

This paper is an attempt to study the issues like usage of digital resources, and services provided by the libraries of the universities of Odisha, its impact on the research its awareness among the users,.. A total number of 88 research scholars from the 3 Universities were selected and their response was obtained with the help of questionnaire. The findings show that research scholars from all these Universities were using digital resources; the awareness about e-resources encourages users to use such resources to the maximum; and problems & constraints in seeking Information. The library can enhance a university's reputation by providing world class information resources and services and can help to stimulate research by promoting collections and services widely.

Use of Digital Resources and Services, electronic journals, Utkal University, Sambalpur University, Berhmpur University

1. Introduction

In the beginning of 20th century, an informal library has been converted into well-managed and formal library system. To make a research, users depends only on libraries and to fulfill the needs of researchers, libraries have to depend on publishers and print-journals. Couple of years backs even the best university libraries in the country fail to subscribe required number of journals for their use. The situation was critical for scientific research scholars in Indian universities. The doctoral studies which deal with new ideas which were not previously treated are the sources of original work. So, library is the partner-in-progress in providing information supports for research. Adequate library supports enables them to obtain good results in research work without wasting much of their valuable time. With the help of computer, libraries have started changing its nature from traditional libraries to automated libraries, then electronic libraries and now in the beginning of 21st century we are dealing with online or digital libraries.

The same way print publishing industry has shifted to e-publishing. The information demands of users are also getting changed with reference to format and speed to access the information. Research is the key factor for the development in all disciplines. Universities are the centre of research. The university libraries play an important role in providing the research information. The requirement of the researcher should be given priority. In the changing information environment, e-journals are claiming its importance in the research activities. The lunch of UGC-Infonet E-Journal consortium in 2004 has changed the entire situation and enriched the resource base of Indian university libraries. Libraries has not self sufficiency of information due to growth of publication are like wild fire to support the research programme. Keeping in view vast information resources the shape of library has changed to digital library, the virtual library and the hybrid library without walls. The collection of information with associated services were information is stored in digital formats, electronics formats of resources and accessible over the networks. "Digital libraries are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of ensure the persistence over time of collection of digital works , so that they are readily and economically available for use by a defined community and or setup communities". (Feather, 2003).

2. Aim and Objectives of the Study

- To find out the objectives of the research scholars using online digital resources.
- Identifying the information needs of the research scholars working in different disciplines in science;

- Use of digital resources through Internet in the WWW system towards supporting research work;
- To know the problems faced by research scholars.
- To draw opinions and suggestions from the users towards improving the accessiblity of the digital resources.

3. Scope of the Study

The present study confined to Utkal University, Sambalpur University and Berhampur University library in the state of Orissa as a case study in general subject fields of science, excluding the engineering, medical and other professional subject, about their different collections. It is also highlights the present scenario in digital resources supporting the research programme in Utkal University, Sambalpur University and Berhampur University.

4. Methodology

In the present study, the questionnaire method has been adopted to collect information from both fulltime and part time research scholars working in various departments in science. As the topic is survey type to collect data from different registered Ph.D scholars of the various disciplines through the questionnaires, with utmost care has been taken to design, in order to obtain valid and reliable information.

5. Analysis and Interpretation of Data

Table No. 1 Distribution of Scholars by Full Time/Part Time

Scholars	Research Scholars								
	Regular				Part Time				
	B.U	U.U	S.U	Total	B.U	U.U	S.U	Total (%)	
	11 (16%)	28 (41%)	30 (43%)	69 (100%)	14 (58%)	08 (33%)	02 (9%)	24 (100%)	x^2=18.537** DF=2
Respondent Scholars(66)	11 (17%)	25 (38%)	30 (45%)	66 (100%)	12 (55%)	08 (36%)	02 (9%)	22 (100%)	x^2=15.068** DF=2

Table 1 the distribution of Scholars Full Time/ Part-Time working as a research scholar in three major universities of Orissa. Out of total response from among regular & part-time, in regular response Sambalpur University responded mostly compared to other two universities. From among part time Berhampur University responded mostly as compared to other twos. Table No. 1shows that the Chi-Square test for independence is significant at 1 per cent level of significance. The value of χ^2 is 18.537 and the degrees of freedom (df) is 2. Also the value of χ^2 is 15.068 and the degrees of freedom (df) is 2.The value of p shows statistically significant ($p<0.01$). This implies that there is a significant variation among the users as far as distribution of scholars by regular and part time is concerned.

Table 2 Distribution of Scholars in discipline wise

Sl.No	User in Discipline wise	Universities			Total (%)
		B.U	S.U	U.U	
1	Botany	06 (26%)	--	07 (21%)	13 (15%)
2	Chemistry	05 (22%)	11 (34%)	06 (18%)	22 (25%)
3	Geology	--	01 (3%)	04 (12%)	05 (6%)
4	Life Science	--	15 (47%)	--	15 (17%)

5	Mathematics	05 (22%)	01 (3%)	02 (7%)	08 (9%)
6	Physics	03 (13%)	04 (13%)	07 (21%)	14 (16%)
7	Zoology	04 (17%)	--	07 (21%)	11 (12%)
	Total	23 (100%)	32 (100%)	33 (100%)	88 (100%)

N.B: x^2=52.830**, DF=12

The Table No.2 shows that the distribution of scholars in discipline wise. Out of total 88 respondents 33(37%) from U.U, 32(36%) from S.U and 23(26%) from B.U. There are seven major disciplines have been choosen from the pure science subject presently imparting teaching in the 3 major universities of Orissa. The classification table which shows that in B.U the major response 26% from Botany, followed by Chemistry & Mathematics 22%, Zoology17% and Physics 13%. Similarly in Sambalpur University the major response from Life science was 47%, followed by Chemistry 34%, Physics 13%, Geology & Mathematics 3% each and response from Utkal University 21% from Botany, Physics and Zoology followed by 18%, Chemistry & Geology 12% and Mathematics 7%.

Table 3: Frequency of Use of Digital Resources

Use of Library	Universities			Total (%)
	B.U.	U.U.	S.U.	
Daily	12 (53%)	19 (58%)	15 (47%)	46(52%)
Once in a week	09 (39%)	08 (24%)	07 (22%)	24(27%)
Fortnightly	01 (4%)	03 (9%)	01 (3%)	05(6%)
Once in a month	Nil	01 (3%)	03 (9%)	04(5%)
Rarely	01 (4%)	02 (6%)	06 (19%)	09(10%)
Total	23(100%)	33(100%)	32(100%)	88(100%)

N.B: x^2=9.574^{NS}, DF=8

Table No.3 indicates that 12(53%) research scholars of B.U uses the digital resources daily, 09(39%) once in a week, 01(4%) each in fortnightly and rarely. Response from research scholars of U.U shows that the digital resources is used more 19(58%) daily, followed by 08(24%) once in a week, 03(9%) fortnightly, 02(6%) rarely and 01(3%) once in a month; whereas 15(47%) research scholars of S.U used the digital resources daily, 07(22%) once in a week, 01(3%) fortnightly, 03(9%) once in a month and 06(19%) rarely. It reveals from the table that maximum scholars use the library daily as compared to other frequencies.

Table 4 - Purpose of use of Digital Resources and Services

Purpose of use	Response			Total (%)
	University Wise			
	B.U.	U.U.	S.U.	
To gain current awareness and keep up to date	14 (16%)	10 (11%)	20 (23%)	44(50%)
To find specific information in the field of interest	19 (22%)	29 (33%)	29 (33%)	77(87%)
To study course materials	11 (12%)	06 (7%)	12 (14%)	29(33%)
To consult Journals/Periodicals for Publication	14 (16%)	27 (31%)	26 (30%)	67(76%)
To Photocopy Materials	12 (14%)	11 (12%)	12 (14%)	35(40%)
To use Web Resources	10 (11%)	19 (22%)	23 (26%)	52(60%)
To meet/support research work	18 (20%)	25 (28%)	20 (23%)	63(72%)

N.B: x^2=16.932^{NS}, DF=14

It has been found from the Table No.4 that for the purpose to gain current awareness and keep up to date the response are 14(16%) of B.U, 10(11%) of U.U and 20(23%) of S.U. For the purpose to find specific information in the field of interest the response rate are 19(22%) of B.U, 29(33%) both from U.U and S.U. Similarly to study course materials the response rates are 11(12%) of B.U, 06(7%) of U.U and 12(14%) of S.U. To consult journals & periodicals for publication the response rates are 14(16%) of B.U, 27(31%) of U.U and 26(30%) of S.U respectively; where as to Photocopy Materials the response rates are11 (12%) of U.U and 12(14%) both from B.U and S.U. To use Web Resources response of B.U is 10(11%), 19(22%) U.U and 23(26%) S.U. For the purpose to support research work the response rates are 18(20%) of B.U, 25(28%) of U.U and 20(23%) of S.U.

Table No.5 Awareness about the library facilities and services

Facilities and Services	B.U		U.U		S.U		Total		Chi-square value, df
	Yes	No	Yes	No	Yes	No	Yes	No	
Facilities	11 (48%)	12 (52%)	15 (45%)	18 (55%)	15 (47%)	17 (53%)	41 (47%)	47 (53%)	$\chi2$ =0.032 DF=2
Services	12 (52%)	11 (48%)	18 (54%)	15 (46%)	16 (50%)	16 (50%)	46 (52%)	42 (48%)	$\chi2$ =23.400 DF=2
Total	23(100)		33(100%)		32(100%)		88(100%)		

The Table No.5 shows about the awareness about the library facilities and services by the users, the scholars of B.U 11(48%) are aware about the facilities and services followed by S.U and U.U 15(47%) and 15(45%).In regards to services 18(54%) scholars of U.U are aware about the services followed by 12(52%) of B.U and 16(50%) of S.U. In the overall analysis it is found from the table that 41(47%) scholars are aware about the library facilities and 46(52%) are aware about the services. The Table No.5.13 shows that the value of $\chi2$ is 0.032 and the degrees of freedom (df) is 2.The chi-square test for users' shows that there is no significance (P>0.05) variation among the users. Also Table No. 5.7 shows that Chi-Square test for independence is not significant at 5 per cent level of significance (P>0.05). The value of $\chi2$ is 23.400 and the degrees of freedom (df) is 2.

Table 6 - Availability of E-Resources in the Library

Sl. No.	E-Resources available in the library	Response			Total (%)
		University Wise			
		B.U	U.U	S.U	
1	E-books	15 (17%)	19 (22%)	16 (18%)	50(57%)
2	E-journals	23 (26%)	33 (38%)	32 (36%)	88(100%)
3	ETD	03 (3%)	09 (10%)	03 (3%)	15(17%)
4	Online Databases	21 (24%)	27 (31%)	21 (24%)	69(78%)
5	WWW	18 (20%)	30 (34%)	29 (33%)	77(88%)
6	Internet	22 (25%)	33 (38%)	28 (32%)	83(94%)
7	Intranet	03 (3%)	07 (8%)	05 (6%)	15(17%)
8	OPAC/Web-OPAC	Nil	Nil	10 (11%)	10(11%)
9	Digital Library/Information	Nil	Nil	10 (11%)	10(11%)
10	Digital Copies	08 (9%)	12 (14%)	07 (8%)	27(31%)
11	E-DDS	Nil	Nil	Nil	Nil
12	CD-ROM Databases	07 (8%)	09 (10%)	09 (10%)	25(28%)
13	Network Based Information Services	03 (3%)	06 (7%)	06 (7%)	15(17%)
14	E-Newspapers	17 (19%)	23 (26%)	19 (22%)	59(67%)

From the Table No.6 it has been found that the E-books are used by 15(17%) of B.U, 19(22%) of U.U and 16(18%) of S.U. The result depicts that research scholar of U.U used more E-books then B.U and S.U. The data from the table reveals that regarding use of E-journals the response of B.U is 23(26%), U.U 33(38%) and S.U 32(36%). The result shows that all the users use the E-books more as compared to other E-resources. The ETD is used very less by the scholars of the three universities of Orissa. It has also been found that 21(24%) both from B.U and S.U and 27(31%) scholars of U.U uses the online databases. The result indicates that the users of U.U used more online databases as compared to users of B.U and S.U. The WWW is used more by 30(34%) of U.U, followed by 29(33%) of S.U and 18(20%) scholars of B.U. Similarly Internet is used maximum by 33(38%) of U.U, followed by 28(32%) of S.U and 22(25%) of B.U. The intranet are used by 03(3%) of B.U, 07(8%) of U.U and 05(6%) of S.U. The use of OPAC and Digital library are very less. The response reveals that the response of the users in positive is below 20%. The digital copies are availed by 08(9%) of B.U, 12(14%) of U.U and 07(8%) of S.U. It has also been found that no user has used the E-DDS services. The CD-Rom databases are used by 07(8%) of B.U and 09(10%) both from U.U and S.U. The uses of Network based information services are very less. The E-Newspapers are used maximum by 23(26%) of U.U, followed by 19(22%) of S.U and 17(19%) of B.U.

Table 7: Maximum Usage of Full Text of e-journals

Sl. No	Subject Directories /Portals/Gateways	Response			Total (%)
		1st Priority	2nd Priority	3rd Priority	
1	UGC INFONET	81 (92%)	05 (6%)	02 (2%)	88(100%)
2	Elsevier's Science Direct	70 (80%)	13 (15%)	05 (6%)	88(100%)
3	Springer Verlag's Link	68 (77%)	11 (13%)	09 (10%)	88(100%)
4	Proquest Science	33 (38%)	25 (28%)	06 (7%)	64(73%)
5	Inspec on El Village	12 (14%)	11(13%)	11 (13%)	34(39%)
6	Math Sci Net	11 (13%)	09 (10%)	12 (14%)	32(36%)
7	Web of Science	23 (26%)	07 (8%)	15 (17%)	45(51%)
8	Emerald	10 (11%)	14 (16%)	16(18%)	40(45%)

From the above table the most used individual Subject Gateways on priority basis UGC-Infonet, Science Direct, Springer Verlag's stands used by the respondents 88(100%) followed by 64(73%) Proquest Sc,, Web of Sc. 45(51%), 40(45%) Emerald, 34(39%) Inspec and 32(36%) Math Science Net. It is found from the both of the analysis of the table that the most frequently priority of use of subject gateways are UGC-Infonet 92%, Science Direct 80% and Springer Verlags 77%. And also these three gateways are found to be used in total 100% by the users, and next to Proquest Science 73% and Web of Science 51%. The reason being other subject gateways less used by the users compared to the above subject gateways may be availability of information related to their subjects and academic requirements least as compared to the above subject gateways.Table No. 10 shows that for users, Chi-Square test for independence is significant at 1 per cent level of significance. The value of χ^2 is 128.621 and the degrees of freedom (df) is 14. The value of p shows statistically significant ($p< 0.01$). This implies that there is a significant variation among the users as far as priority of searching information on internet is concerned.

Table No. 8 Use of Digital Resources

Electronic Information Resources	B.U	U.U	S.U	Total
Adequately	10 (43%)	15 (45%)	13 (41%)	38 (43%)
Not Adequately	13 (57%)	18 (55%)	19 (59%)	50 (57%)
Total	23(100%)	33(100%)	32(100%)	88(100%)

N.B: $x2=0.156^{NS}$, DF=2

From the Table No.8 the users are asked about how much they used electronic information resources available in the libraries, two options adequately and not adequately were given where 15(45%) users of U.U are using adequately followed by 10(43%) and 13(41%) of B.U and S.U respectively. The overall uses of electronic information by the scholars of three major universities are 38(43%). The result indicates from the table that most of the users of 59% of S.U, 57% of B.U and 55% of U.U are not adequately using the electronic information resources. The overall the scholars are not adequately using the electronic information resources is 57%. The Table No.5.21 shows that the value of $\chi 2$ is 0.156 and the degrees of freedom (df) is 2. The significant chi-square test for users' shows that there is no significant ($p>0.05$) variation among the users as far as purposes of using of electronic information resources is concerned.

Table No. 9 User satisfaction level on E-resources & E-Services

Sl. No	E-Resources & E-Services	Satisfaction			Total (%)
		Satisfied	Partly Satisfied	Not Satisfied	
1	CD-ROM Database	06 (7%)	58 (66%)	26 (30%)	88(100%)
2	WWW	66 (75%)	20 (23%)	02 (2%)	88(100%)
3	Internet	71 (81%)	13 (15%)	04 (5%)	88(100%)
4	Online Databases	46 (52%)	31 (35%)	11 (13%)	88(100%)
5	E-Journals	58 (66%)	24 (27%)	06 (7%)	88(100%)
6	E-Books	23 (26%)	42 (48%)	23 (26%)	88(100%)
7	OPAC/Web-OPAC	06 (7%)	05 (6%)	77 (87%)	88(100%)
8	Digital Library	Nil	03 (3%)	85 (97%)	88(100%)
9	Networked based Information & Services	11 (13%)	18 (20%)	59 (67%)	88(100%)
10	University Website	65 (74%)	13 (15%)	10 (11%)	88(100%)

N.B: $x^2=620.592^{**}$, DF=18

The Table No.9 presents the opinion of the research scholars about the satisfaction of existing E-resources and services of the library. It has been found from the table that among 88 respondents, only 06(7%) are satisfied with the CD-ROM databases whereas 58(66%) are partly satisfied and 26(30%) are not satisfied. Similarly regarding www maximum 66(75%) scholars are satisfied while 20(23%) partly satisfied and only 02(2%) are not satisfied. In case of internet services maximum 71(81%) respondents are satisfied with the internet services provided by libraries whereas 13(15%) are partly satisfied and 04(5%) are not satisfied. In case of Online databases 46(52%) are satisfied, 31(35%) partly satisfied and 11(13%) are not satisfied. Regarding E-journals maximum 58(66%) scholars are satisfied with this e-resource while 24(27%) partly satisfied and only 06(7%) are not satisfied. About E-books maximum 42(48%) are partly satisfied and 23(26%) both are satisfied and not satisfied with this resource. It also reveals from the table that maximum 77(87%) scholars are not satisfied with OPAC/Web OPAC services provided by the libraries. Similarly regarding digital library maximum 85(97%) researchers are not satisfied with this service at all. In case of Network based information & services 59(67%) scholars are not satisfied while 18(20%) partly satisfied and only 11(13%) are satisfied. It has also been found from the table that 65(74%) researchers are satisfied with their respective university websites where as 13(15%) partly satisfied and 10(11%) are not satisfied.

Table No. 10 Access to Institutional Repositories (E-Resources)

Sl.No.	Types of Institutional Repositories	Access			Total (%)
		University Wise			
		B.U	U.U	S.U	
1	Theses/Dissertations (M.Phil./Doctoral/ Post-Doctoral	20 (23%)	33 (38%)	27 (31%)	80(91%)
2	Research Article	21 (24%)	29 (33%)	32 (36%)	82(93%)
3	Conference/Seminar Proceedings	17 (19%)	28 (32%)	27 (31%)	72(82%)
4	Reviews/Previews	17 (19%)	21 (24%)	23 (26%)	61(69%)
5	Patents	04 (5%)	08 (9%)	03 (3%)	15(17%)
6	Standards	03 (3%)	03 (3%)	04 (5%)	10(11%)
7	Specifications	03 (3%)	06 (7%)	15 (17%)	24(27%)
8	State of the Art Reports	03 (3%)	05 (6%)	02 (2%)	10(11%)
9	Intellectual Properties	05 (6%)	06 (7%)	04 (5%)	15(17%)

N.B: $x^2=12.479^{NS}$, DF=16

The data from the table reveals that the theses/Dissertations are used by 20(23%) of B.U, 33(38%) of U.U and 27(31%) scholars of S.U. The result shows that the scholars of U.U used this more as compared to others. Research articles are used maximum by 32(36%) of S.U, followed by 29(32%) of U.U and 21(24%) research scholars of B.U. It has been found that 17(19%) of B.U, 28(32%) of U.U and 27(31%) scholars of S.U used the conference and seminar proceedings. The reviews/previews are used more by 23(26%) scholars of S.U, followed by 21(24%) of U.U and 17(19%) of B.U. The use of patents and standards are very less. The response reveals that the response of the users in positive is below 10%. Specifications are used by 03(3%) of B.U, 05(6%) of U.U and 15(17%) of S.U. It has also been found from the table that use of state of the art reports and intellectual properties are very less. The response reveals that the response of the scholars in positive is below 10%.The Table No.10 shows that the value of χ^2 is 12.479 and the degrees of freedom (df) is 16. The significant chi-square test for users' shows that there is no significant variation among the users as far as using of institutional repositories by the scholars is concerned.

Table No. 11 Problems & Constraints in seeking Information

Sl.No.	Types of problems & constraints	Response			Total (%)
		University Wise			
		B.U.	U.U.	S.U.	
1	Materials are not available	14 (16%)	10 (11%)	20 (23%)	44(50%)
2	Incomplete information materials	19 (22%)	29 (33%)	29 (33%)	77(88%)
3	Difficult in finding relevant information	11 (13%)	06 (7%)	12 (14%)	29(33%)
4	Slow internet access	14 (16%)	27 (31%)	26 (30%)	67(76%)
5	Overload of information on Internet	12 (14%)	11 (13%)	12 (14%)	35(40%)
6	Long time to download information	10 (11%)	19 (22%)	23 (26%)	52(59%)
7	Conversation of information	03 (3%)	08 (9%)	16 (18%)	27(30%)
8	Lack of attitudes of library staffs	18 (20%)	25 (28%)	20 (23%)	63(71%)

N.B: $x^2=16.932^{NS}$, DF=14

The users are making use of e-resources and services provided by the university libraries. So they are asked about various types of problems they face while using e-resources and services. From Table No.11 it is evident that 14(16%) research scholars of B.U, 10(11%) of U.U and 20(23%) of S.U feels that materials are not available in their respective libraries. 19(22%) research scholars of B.U and 29(33%) both from U.U and S.U admitted that maximum information materials are incomplete. From the data it has been found that 11(13%) of B.U, 06(7%) of U.U and 12(14%) scholars of S.U are facing difficulty while finding relevant information. 14(12%) of B.U, 27(31%) of U.U and 26(30%) scholars of S.U admitted that accessing information from internet is very slow. It reveals from the table that 11(13%) of U.U and 12(14%) scholars both from B.U and S.U are facing problems due to overload of information on internet. 10(11%) of B.U, 19(22%) of U.U and 23(26%) research scholars of S.U expressed that it has been taken long time to download relevant information through internet. It has been found that very less percentage of research scholars are facing difficulty in conversation of information. 18(20%) of B.U, 25(28%) of U.U and 20(23%) research scholars of S.U admitted that they are facing lots of problems while seeking information due to lack of attitudes of library staff members. The Table No.11 shows that the value of χ^2 is 16.932 and the degrees of freedom (df) is 14. The significant chi-square test for users' shows that there is no significant variation among the users as far as facing problems and constraints in seeking information by the scholars is concerned.

6. Suggestion

- If the library has should remain opened 24× 7the research scholar would have been use and spend more time in the library.
- It is suggested that the library should conduct library orientation and library user education programme in a regular interval and also announce about the facilities and services provided and extended to the users
- The library should creat their OPAC and increase further reference tools and develop content lists which are more dependent tools by the research scholar particularly at the age of information society OPAC/ Web OPAC played a major role in searching of information by the Users
- The library should take necessary steps to build the primary resource collection, beside that the library should also develop library resources on providing more indexes, abstracts, research reports, review articles etc.
- Technical staff or technically trained staff should be apointed to assist the users in accessing the information. There should be complete campus networking. Problems realted to slow connectivity should be overcome by upgrading bandwidth.

7. Conclusion:

Universities are knowledge based organizations whose functions are largely confined to teaching and research. In the changing information environment electronic era, ICT and its digital resources are claiming its importance in the research activities in the research activities. In the developing countries like India, the researchers have realised the importance of the digital resources. It was evident from the study that science discipline researchers are more conversant with the use of digital resources. The library can enhance a university's reputation by providing world class information resources and services and can help to stimulate research by promoting collections and services widly. It is the responsibility of the University libraries to provide the information requirements of the researchers from time to time.

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Use and Impact of Internet among Distance Education Learners in Sri Venkateswara University, Tirupati (AP): *A Study*

Konappa, D **Chandran, D**



The present study has been undertaken with an attempt to evaluate the Use and Impact of Internet among Distance Education Learners in Sri Venkateswara University, Tirupati amongst the P.G students and Under Graduate studentsy with special reference to Sri Venkateswara University which represent truly population. For that purpose, survey method has been adopted by the investigators, which comprises of administration of questionnaire, observation of the participants, and interview of some of the participants for knowing the opinion of the respondents in respect of use of internet for their academic and research activities.



Distance Education, Internet, e-resources, Sri Venkateswara University.

1. Introduction

The present era of globalization is marked by rapid and widespread technological, economic, and social changes, all of which raise important questions for educators. Described by such terms as 'knowledge explosion,' 'information era' and 'information hype,' we are living in an era where knowledge is evolving at a rapid speed, where students and teachers alike are called upon to quickly assume new skills, competencies, and knowledge. However, in spite of its positive economic impact on society a whole, skills and knowledge development are increasingly seen as a responsibility of individuals. Clearly the acquisition of new skills, competencies, and knowledge are essential for individuals to gain better and more lucrative employment opportunities in the new world economy. Therefore, both individuals and society must keep abreast with constant changes occurring in today's global economy.

The Internet plays a significant role in the most sought after modern library's reserves conventionally sources in satisfying varied needs of students, teachers, and researchers with minimum risk and time. Information technology has changed the world and has become one of the important tools for retrieving information. The electronic information resources constitute a major portion of library collections. The value and use of information resources, particularly internet, have increased with the time. Therefore, there is necessity to make study on the different aspects of internet use among the students of academic institutions. The convergence of ICTs as embodied in the Internet has transformed the present day society into a knowledge society. Earlier, information and knowledge were passed by words of mouth or through manuscripts, and communication was a slow process. Today it is passed from one individual to an infinite number of other users through a number of media and formats which makes rapid and widespread dissemination of information possible. New technologies bring us an unparalleled flood of information. Along with word processing, the Internet is considered to be the most valuable of the many computer technologies available to the society today.

2. Internet and Distance Education

Traditionally, distance education (DE) consisted of and used passive media such as print media, radio, and videotaped lessons, teaching and learning modes that often derive low potential for interactivity. Within the context of traditional DE delivery, interactivity occurred mainly through asynchronous correspondence between individual students and their instructors using print materials. With the advent of the Internet based technologies, however, DE practitioners now have at their fingertips technology that allows them to magnify and greatly enhance the quality of current DE models, thereby creating new and increased levels of interaction, communication, and collaboration among and between students, teachers, and their institution. According to Harasim, online course characteristics include independence of time and place, communication

of many to many, collaboration of learning, and dependence in literal communication. Harasim also points to the many advantages of DE delivered via new technology: it allows for synchronous or asynchronous communication among students and teachers, regardless of time and space constraints, a condition which increases educational access to geographically isolated communities and interaction between diverse cultures.

Access to Internet-based technology, specifically late model computers and a trustworthy telecommunications infrastructure, is necessary for online DE instruction. Berge nonetheless considers technology as a secondary/ supportive player. Instead, he argues that careful construction and delivery of DE planning processes, including clear specification of learning objectives, must remain central to educational success. Internet technologies must be viewed as merely as the vehicle in which the interactions between the students and teachers travel, a means of intellectual transportation that helps people span geographic distances.

3. Objectives

- To analyze the patterns of use of Internet and the Internet skills of the distant education learners of the Sri VenkateswaraUniversity, Tirupati.
- To determine the level of Distance Education Learners frequency of access to Internet
- To study the different purposes of using Internet.
- To study the Methods of learning to use Internet.
- To identify the challenges faced in the use of Internet.
- To find the satisfaction derived by the researchers with the Internet and electronic resources and to find an answer to the question: Can Internet and electronic resources replace print resources?

4. Scope and Limitations of the Study

The scope of the present study has limited to 2013-14 Distance Education Learners of Sri Venkateswara University only. The population of this study consists of Distance Education P.G. Students and Under Graduate Students.

5. Methodology

The survey method was adopted for the present study and a questionnaire was used as a data collection tool. The majority of the questions were objective type designed keeping the objective of the study in view. The questionnaire was distributed to all the Distance Education Learners of Sri Venkateswara University, Tirupati. Convenient sampling was used for data collecting.

6. Data analysis

A total 275 out of 300 Distance Education P.G. Students and Under Graduate Students of Sri Venkateswara University, Tirupati they were taken for the study and responded with the response rate is 91.67%, which is presented in Table 1

Table 1: Distribution of Questionnaires and Responses

S.No.	Gender	No. of questionnaires Distributed	%	No. of questionnaires Responded	%
1	Male	200	66.67	197	65.67
2	Female	100	33.33	78	26.00
Total		**300**	**100**	**275**	**91.67**

As already noted, the total sample of users covered in the study is 275, comprising 91.67% Distance Education Learners. Gender wise 65.67% of responded of the male category and remaining 26% of responded of the female category.

Table 2: Category wise distribution of Respondents

S.No.	Academic Status	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Post Graduate Students	103	37.45	46	16.73	149	54.18
2	Under Graduate Students	94	34.18	32	11.64	126	45.82
Total		**197**	**71.64**	**78**	**28.36**	**275**	**100**

Table 2 shows that 54.18% of the respondents were post graduate students and only 45.82% were under graduate students. Gender wise, 37.45% of the male and 16.73% of the female respondents were post graduate students. 34.18% of the male and 11.64% of the female respondents were under graduate students.

Table 3: Level of Internet and computer literacy

S.No.	Variables	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Expert	126	45.82	53	19.27	179	65.09
2	Average	46	16.73	18	6.55	64	23.27
3	Below Average	25	9.09	7	2.55	32	11.64
Total		**197**	**71.64**	**78**	**28.36**	**275**	**100**

The respondents were asked to indicate their level of Internet and computer literacy. It is evident from Table 3 that majority of the respondents (65.09%) have an expert level of Internet and computer literacy. Only 23.27% admitted that they are average level of internet and computer literacy. 11.64% of the respondents reported that they have below average level of Internet and computer literacy.

Table 4 highlights the location from where the Internet and electronic resources are mostly accessed by the distance education learners of Sri Venkateswara University, Tirupati. A majority of the respondents i.e. 45.45% access the Internet from the home, while 22.18% also access from university, 21.09% of the respondents at their working places and 11.27% use cyber cafes for accessing the Internet and electronic resources.

Table 4: Location for use of Internet and Electronic Resources

S.No.	Location	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Home	79	28.73	46	16.73	125	45.45
2	University	46	16.73	15	5.45	61	22.18
3	Cybercafé	25	9.09	6	2.18	31	11.27
4	At your Working place	47	17.09	11	4.00	58	21.09
Total		**197**	**71.64**	**78**	**28.36**	**275**	**100**

Table 5: Frequency of using Internet

S.No	Frequency	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Everyday	89	32.36	39	14.18	128	46.55
2	Twice a week	38	13.82	18	6.55	56	20.36
3	Once in a week	28	10.18	10	3.64	38	13.82
4	Twice a month	15	5.45	6	2.18	21	7.64
5	Once in a month	13	4.73	3	1.09	16	5.82
6	Occasionally	8	2.91	0	0.00	8	2.91
7	Never use	6	2.18	2	0.73	8	2.91
Total		**197**	**71.64**	**78**	**28.36**	**275**	**100**

Table 5 shows that the majority of 128 (46.55%) respondents are use Internet an everyday. Also 56 (20.36%) of the respondents use Internet on twice a week, also 38 (13.82%) of the respondents are using the Internet once in a week, 21 (7.64%) use Internet on twice a month and 16 (5.82%) of use it once in a month. It is interesting to note that, only 8 (2.91%) of the respondents respectively use it occasionally and never use of internet.

Table 6 describes the majority of the respondents (80%) reported that they use electronic information sources for the purpose of ongoing study work. Followed by 57.82% of the respondents use internet for the purpose of "Project/Dissertation". Also 54.55% of the respondent's use of internet for their "Preparation of notes" and 41.09% of the respondents are using internet for the purpose of they"Update subject knowledge". About 20.73% of the respondents use internet for the purpose of "entertainment" and only 19.27% of the respondents use the same for "Writing an article for publication".

Table 6: Purpose of using Internet

S.No.	Purpose	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Ongoing study work	153	55.64	67	24.36	220	80.00
2	Preparation of notes	98	35.64	52	18.91	150	54.55
3	Update subject knowledge	87	31.64	26	9.45	113	41.09
4	Project/Dissertation	112	40.73	47	17.09	159	57.82
5	Writing a article for publication	36	13.09	17	6.18	53	19.27
6	Entertainment	49	17.82	8	2.91	57	20.73

Table 7: Methods of learning to using Internet

S.No.	Methods	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Self study	45	16.36	11	4.00	56	20.36
2	With the assistance of colleagues/friends	36	13.09	15	5.45	51	18.55
3	Courses offered by university	31	11.27	6	2.18	37	13.45
4	External Courses	85	30.91	46	16.73	131	47.64
Total		**197**	**71.64**	**78**	**28.36**	**275**	**100**

Table 7 depicts that the most popular method of acquiring the necessary skills to use Internet is via training courses offered by external agency. A majority of the respondents (i.e. 47.64%) used this method to learn the Internet, followed by self study method with 20.36% responses. 18.55% of the respondents learnt the Internet through the assistance of colleagues/friends and 13.45% through training courses offered by university.

Table 8: Problems encounter while using Internet

S.No.	Variables	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Incessant power outage	197	71.64	78	28.36	275	100
2	Slow internet connectivity	87	31.64	54	19.64	141	51.27
3	Inability to use computer	93	33.82	37	13.45	130	47.27
4	Selecting search terms	27	9.82	21	7.64	48	17.45
5	Finding relevant information	74	26.91	41	14.91	115	41.82
6	Lack of IT skills	85	30.91	53	19.27	138	50.18
7	Virus	56	20.36	38	13.82	94	34.18

Table 8 depicts the problems faced by the users in surfing. Majority of the respondents (100%) reported that they faced incessant power outage while using internet. Followed by 51.27% of the respondents find it Slow internet connectivity. 50.18 % find they have no lack of IT skills. 47.27% opinion

that they face the problem of inability to use computers. 41.82% of the respondents are difficult to get the relevant information from the Internet. 34.18% opinion that they face the problem of virus in the computer. 17.45% of the respondents are encounter the problem of selecting search terms.

Table 9: Do you think Internet and electronic resources can replace print resources?

S.No.	Status	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Yes	156	56.73	64	23.27	220	80.00
2	No	41	14.91	14	5.09	55	20.00
Total		**197**	**71.64**	**78**	**28.36**	**275**	**100**

A majority of the respondents (80%) feel that Internet and electronic resources can replace print resources. Only 20% of the respondents feel that the Internet and electronic resources cannot replace the physical resources (print resources), but only supplements the print resources.

7. Recommendations

Based on the findings of the study the following suggestions are made:

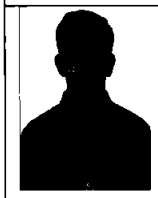
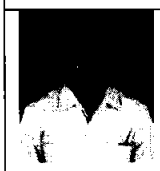
- The Internet and allied technologies should be included in the curriculum of all distance education programmes.
- Libraries of distance education study centers should subscribe more e-journals and e-databases.
- Some orientation training progammes should be organized by the university at regular intervals so that the maximum users can improve their excellence or proficiency in the use of the Internet for academic purposes.
- Information regarding the popular and the latest websites with their addresses should be displayed on the notice board in the study center computer lab.
- The qualified IT staff should be appointed to provide the expert guidance to users about e-resources and Internet.

8. Conclusion

New information and communication technologies developed and designed specifically for educational purposes have greatly enhanced the development and quality distance education. To maximize potential techniques and to optimize new distance modalities of educational delivery, close coordination and ongoing exploration of new ways of providing enhanced student support are necessary. The library environment has currently undergone drastic change in terms of collections and services. The proliferation of e-resources has had a significant impact on the way the academic community uses, stores, and preserves information. The advantages of e-resources have drawn attention of the library users to a great extent. Accordingly, these resources have occupied a significant place in the collection and budget of almost all libraries. The study showed that Internet has radical impact on the changing higher education environment. It is interesting that Internet use among distance education learners of Sri Venkateswara University, Tirupati is much higher than expected. Academic resources offered online in their disciplines are reported to be inadequate (as compared to online academic resources in Sciences) and mostly in English language. The other issue was lack any formal training about how to locate these resources by saving time and efforts. Slow speed, lack of computers, lack of time, and lack of access from home are found to be the major problems. For this purpose, The Sri Venkateswara University, Tirupati needs to improve its IT infrastructure, including providing distance access. The use of Internet and electronic information sources for study and research purposes must be encouraged and proper training should be provided.

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Use of E-Resources among Students, Researchers and Faculty Members of Integral University: *A Case Study*

Aklesh Kumar, **Choudhary, R K** **Pooja Verma**

The present study explores the use of e-resources by the researcher student and faculty members of Integral University (IU)). A survey was designed for the purpose to collect the basic information about the level of use of e-resources as well as other factors contributing to an associated with their use. The study revealed that the majority of respondent shad used electronic resources. Some Users were not satisfied with the electronic information services offered by the libraries and they strongly believed that currently available e-resources were not properly utilized due to the some difficulties/problem like slow access speed, difficulty in finding relevant information, etc the study conformed the most of the students, researcher, faculty member are aware of the e- resources.

E-resources, Integral University, e - journal, e -book, database

1. Introduction

Any educational or research institutions the library play very important role. The library is a heart of any institution, the integral university has well equipped and up to date library it supports almost all faculty members, students, and researcher of the university. The Integral University founded in 2004. Integral university is a state university in Lucknow, the capital of Uttar Pradesh, India, which was established as a university from the Institute of Integral Technology under act number 9 of 2004 by the Uttar Pradesh state government, the university is divided into four bloc administrative block, academic block, medical block, and library block, it covers thirteen faculty and more than thirty deportment, the university covers more than four thousand student ,the university provide undergraduate degree, post graduate degree, doctoral degree, and diploma etc,

Today we are living in the age of information. The information is a dynamic and unending resource that affects all disciplines and walks of life. Over last decade, electronic resources have become increasingly substantial components of academic library collection. This is due to the continuous development of Information Technology and its impact on library collection development policies due to changing demand of users for the pin pointed and exhaustive information within a short time. With the growing popularity of e-resources, the traditional libraries are gradually migrating from print documents to e-resources where providing access to information is considered more important than owning it. This has compelled libraries to rethink about their collection. No doubt importance about e –resources rather than print resources. The electronic resources are systems in which information is stored electronically and made accessible through electronic system and computers networks. the resources include OPAC, CD-ROMs, Online database, e-journal, e-book, Internet resources etc. multiple accesses speed, richer in content, timeless anywhere access is the some of the feature of the e-resources.

2. Objectives: The main objectives of the study are as follows:

- To discover the awareness, use, purpose and level of use of information sources by the Faculty members, Research scholars and students of the Integral University;
- To find out the purpose & frequency of using e -resources and services available in the integral university Library;
- To identify the place from where users accessing e-resources and services;
- To find out the basic search strategies for accessing - resources;
- To discover which/what type of problems faced by them, while using e – resources;
- To identify the problems faced by the research scholars while accessing e-resources;

- To find the purpose of visit the library;
- To find out the frequency of access the E-resources;
- To find the level of satisfaction with existing information sources;
- Suggest the ways and means for effective use of resources;

3. Methodology

Survey method has been adopted to complete the study. The study has been carried out by survey strategy using questionnaires for students, research scholar and faculty. Only 110 questionnaires were distributed among the research scholars UG and PG students of the university. Out of the total respondents only 60 were returned the questionnaire. Few questionnaires were incomplete and others completed. The findings of the present study are thus based purely on the responses made in the questionnaire returned by the respondents.

4. Limitation of the Study

Every University has the E-resource collection in their libraries but the present study is restricted to the use and impact of E-Resources by the users Integral University situated at Uttar Pradesh, India.

5. Data Analysis and Discussion

Table 1 Gender wise frequency of respondent

Gender	Respondent	Percentage
Male	40	66
Female	20	33

In the all respondent 66% of male and only 33% female student respond the questionnaire

Table 2 frequency of using E – Resources

Frequency of use	Respondent	Percentage
Daily	55	91
Weekly	30	50
Monthly	10	16

Above table indicates that 91% users use e-resources daily, 50% once in a week, 16% each in weekly.16% user use e- resources . Maximum number of users uses e- resources daily as compared to other timings..

Table 3 Purpose of Using E-resources

Purpose to read and search E –Resources	Respondent	Percentage
Research	40	66
Education	55	91
For carrier development	35	58
To keep yourself up to date	55	91
For completion of Assignments and Seminar presentations	33	55

There are different purposes amongst users in using e-resources. User was asked about their purpose to access and use the e-resources. In this question, many purposes were listed, out of which most important are detailed in the given Table 3 so the 66 per cent of the users use e-resources for research and 91% of user uses e-resources for education purpose, 55% of user use e-resources for carrier development, 91% use for keep to up to date for yourself and 55% users use the e-resources for completion assignment and seminar presentation.

Table 4 Types of E-Resources most frequently used

Type of E -Resources	Respondent	Percentage
E – book	30	50
E – Magazines	40	66
E-Thesis	10	16
WWW	55	91
E-Newspapers	20	33
E-Mail	45	75
Bibliographic Databases	5	8
E-Research report	2	3
Any others	Nil	

From the above Table it has been found that the E-books are used 50%, E -Magazine used 66, E - thesis is used 16%, 91% uses the WWW, E – Newspaper is used 33%, E- mail used by 755 users, only 8% users use bibliographic database , 3% use E research reports.

Table 5 Access points of E-Resources

Access points of E-Resources	Respondent	Percentage
Informatics Centre	50	91
Departments	40	60
Cyber Café	10	16
At Home	2	3
University Hostels	15	25

Above table replicates the Access points from where the respondents are accessing the E-resources. Information Centre, departments, university hostels, home and cyber café are the major accessing points for E-resources. Information centre dominates the list as more than 50 respondents of 60 respondents accessing through information centres followed by departments and university hostels. Majority of the user are accessing the E -resources at university information centre and university hostels. The faculty members are accessing from the departments and at home as they are provided with well facilities at department and at home. 25% users use at university hostel.

Table 6 Satisfaction with e – resources facilities

Satisfaction label	Respondent	Percentage
Fully	20	33
Partially	30	50
Lease satisfied	10	16

Above table so the only 33% of the user fully satisfied from e -resources, 55% user partially satisfied and 16 % users lease satisfied from e- resources available in the university library.

Table 7 Problem encountered while using e – resources

Problem	Respondent	Percentage
Slow access speed	20	33
Difficulty in finding relevant information	30	50
Overload of information on the internet	40	60
It looks too long to view/ download page	55	91
Authenticity of information	50	83

The users are making use of Electronic Information Resources provided by the university libraries. So they are asked about various types of problems they face while using e-resources. Users admitted that they are facing lots of problems while seeking information due to lack of slow access speed ,50% users facing difficulty in finding relevant information ,60% users think that overload of information on the internet ,91% looks too long the download the particular information,83 users confused about authenticity of e - resources.

Table 8 Limitation/Barrier you feel for using the electronic Resources

Limitation/Barrier	Respondent	Percentage
Lack of time	30	50
No Knowledge of using	10	16
Uncomfortable	3	5
Access time is slow	12	20
Unorganized	30	50
Not easy to use	10	16

Most of the users faced various problem at the time of accessing e-resources ,50 % users face the problem cause of lack of time , 16% user are no knowledge of using e- resources ,only 5% user uncomfortable these type of resources,50 % user trouble from unorganized information,16% users think that e-resources are not easy to use.

Table 9 The services available in the university

Affecting factors	Yes	No
Photo copy services	Yes	
OPAC	Yes	
BBS services		No
SDI service		No
Print out services	Yes	
Online resources available	Yes	

Above mention data shows that important services / facility for e – resources is available in the Integral university, no doubt about that Library of Integral university is best library in the state private university.

6. Findings

The main problems in accessing the e-resources as pointed by the respondents are the speed of host website which is very slow in some time.

- Most of the respondents think the importance of the e-resources is very much required for study, teaching and research.
- Most of the library members access the e-journals daily, which is a good sign for any academic institutions.
- Almost all members of library are aware of the e-resources.

7. Suggestions

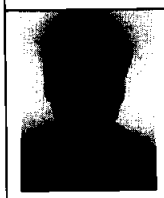
- Almost all the users agree, perceive and acknowledged and the importance and use of internet in the today ICT environments and more particularly in their research activities.
- The library should organize training program for the library professionals so that they are able to assist users and they can work with comfort in the technical environment.
- Major problem with faculty is slow internet connection so this can be addressed by university by increasing the bandwidth of the internet connectivity.
- Development of infrastructure facility for accessing e-resources by the users.
- Adequate training programme for users for proper use of e-resources.
- More personalized service required to users by the library staff in accessing the e-resources.

8. Conclusion

It is very essential for any higher education library to develop with a high technological infrastructure and build a solid collection of e-resources to help its users and provide high quality services to the user's desktop. Libraries should organize various teaching and learning programs, either general training or subject specific training to impart and encourage education about all aspects of e-resources to its users. Libraries should develop their own subject gateways, portals and data archives to provide access to back volumes to know the past research done and to focus on present research trends in order to move towards a brighter future.

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Use of E-Resources by Faculty Members of Sri Venkateswara University, Tirupati (A.P): *An Analytical Study*

Konappa, D

Dastagiri, D

In the 21st century E-resources became essence of every intellectual activity of higher education. Realizing the Importance of the E-resources most of the universities in India liberally investing to provide access to these resources to support learning, teaching and research. In this way Sri Venkateswara University gained a prominent place by providing huge number of valuable and quality E-resources to the university user community with a more advanced infrastructure. The present paper examines, how far the faculty members are benefitted the existence of various E-resources, awareness about E-resources, preference to E-resources, Assess Points of E-resources, prefer of the search engine for accessing the E-resources and purpose of E-resources has been successfully reflected in this paper.

ICT, Internet, E-resources, E-Journals, E-databases, Search engines and Sri Venkateswara University.

1. Introduction

The application of ICTs in science research has given new avenues and constructive changes in every aspects of human life. Today the novel application of ICT in knowledge generation and communication have brought the users and knowledge more closer, the way information is gathered, stored, organized, accessed, retrieved and consumed are really productive and more user friendly. The application of computers in information processing has brought several products and services to the users and that made libraries more competitive to meet the complex and ever changing needs of user community with most effectively and economically. Universities are the highest learning centres and intellectual hubs of every nation and university libraries are the driving force behind all the intellectual activities of universities. Universities libraries are today moving towards having access to more and more E-resources in their collection as they form major intellectual research output of the world. To support teaching, learning and research activities of the academic community of the university Sri Venkateswara University (SVU) having access to huge number of E-resources and this study is to realize its usage pattern and Impact to further enhance the utilization of E-resources at the University.

2. Need for the Study

Universities are the higher Intellectual hubs to transmit knowledge and understanding of ideas and values to students and research community through various intellectual means and library is an important agent in this process. University libraries are the heart of every university as it supports every teaching, learning and research activity. Libraries are now moved from traditional resources to more dynamic and flexible E-resources, Sri Venkateswara University Library is ahead of many other libraries in this way as it have the access to huge and valuable E-resources. Understanding the constructive impact and cost effectiveness of any new service is the intelligent strategy of every manager to know how well their initiations influenced the targeted group and purpose. With this concern to measure the impact of E-resources the present study has been taken up to know the current state of the use of E-resources and its impact on the teachers, students and research scholars of the Sri Venkateswara University to further enhance the Utility of E-resources.

3. **Objectives:** The presented study keeps in its ambit the following aims and objectives

- To evaluate the existing electronic information environment of the university library of Sri Venkateswara University and to find out the ways and means of better information related situation;

- To determine the availability of e-resources in the university library of Sri Venkateswara University;
- To identify the use of e-resources by faculty of the Sri Venkateswara University;
- To find out the level of use of e-resources by the user;
- To sort out the use of e-journals by the users still print out articles that are judged useful;
- To assess the personal subscription to journals continue to decrease for which users rely more on electronic subscriptions subsidized by the library and on the internet;
- To demarcate the use of e-books as available in the university library systems;
- To determine the use of other e-resources for their research and academic work; and
- To provide clue for solution of any or all of these problems relating to the use of e-resources in science and allied subjects.

4. Scope And Limitation Of The Study

The present study confined to the faculties of Science Department in Sri Venkateswara University (SVU), Tirupati for studying their use of e-resources behavior and approaches over internet. Besides, the study is limited to the Science department faculties only; it does not include other discipline Faculties and students.

5. Methodology

The survey method was adopted for the present study and a questionnaire was used as a data collection tool. The questionnaires have been formulated and distributed among the 100 faculty members of the Science Departments, SVU irrespective of their gender, designation, educational qualification and age. They have been asked to fill up the same. Among all of them, 85 numbers (85.00% of total strength) agreed to fill up the questionnaires. Thereafter the Investigation is carried out based on the collective responses which are narrated in the following section.

6. Data Analysis

Table 1: Response from the Science Department's Faculties, SVU

S.No.	Name of the Department	No. of Faculties	Distribution of Questionnaires	No. of Respondents
1	Anthropology	8	6	5
2	Bio-Chemistry	5	3	3
3	Bio-Technology	4	2	2
4	Botany	10	9	8
5	Chemistry	17	12	11
6	Environmental Sciences	3	3	2
7	Fishery Sciences & Aqua-Culture	3	2	1
8	Future Studies	3	2	2
9	Geography	5	5	5
10	Geology	7	6	5
11	Home Science	7	5	4
12	Mathematics	10	7	6
13	Microbiology	2	2	1
14	Physics	11	8	6
15	Psychology	8	5	5
16	Statistics	9	8	7
17	Virology	5	5	3
18	Zoology	17	10	9
Total (Percentage)		**134**	**100 (74.63)**	**85 (85.00)**

Table 1 indicates the total number of faculty members in Science departments and the number of faculties who have responded to the questionnaire. A total 85 out of 100 faculty members of science department in Sri Venkateswara University, Tirupati they were taken for the study and responded with the response rate is 85.00%.

Table 2: Gender wise Distribution of Questionnaires

S.No.	Gender	Distribution of Questionnaires		No. of Respondents	
		No.	%	No.	%
1	Male	68	68.00	59	69.41
2	Female	32	32.00	26	30.59
Total		**100**	**100.00**	**85**	**100.00**

Table 2 indicates that the majority of 59 (69.41%) respondents were male faculties and 26 (30.59%) of the female faculties were responded.

Table 3: Accessing to Internet

S.No.	Variables	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Yes	59	69.41	26	30.59	85	100
2	No	0	0.00	0	0.00	0	0.00
Total		**59**	**69.41**	**26**	**30.59**	**85**	**100**

The study reveals that the faculty members of science department, SVU are the serious users in respect to the use of internet. The researcher interpreted it from the above table that all the faculties of Science Departments, SVU are using internet.

Table 4: Experience on use of Internet

S.No.	Variables	Male		Female		Total	
		No.	%	No.	%	No.	%
1	No experience	0	0.00	0	0.00	0	0.00
2	Very little experience	4	4.71	1	1.18	5	5.88
3	A moderate amount of experience	38	44.71	18	21.18	56	65.88
4	A great deal of experience	17	20.00	7	8.24	24	28.24
Total		**59**	**69.41**	**26**	**30.59**	**85**	**100**

The Table 4 revealed that most of the faculties have experienced on use of internet in varied way of their perseverance. Among them 56 (65.28%) have moderate amount of experience on internet, followed by 24 (28.24%) a great deal of experience and 5 (5.88%) very little experience. Thus it can be interpreted that majority of them have moderate amount of experience in internet searching.

Table 5: Use of ICT Devices

S.No.	Devices	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Personal Computer	37	43.53	21	24.71	58	68.24
2	Laptop	19	22.35	5	5.88	24	28.24
3	Any Other ICT Devices	3	3.53	0	0.00	3	3.53
Total		**59**	**69.41**	**26**	**30.59**	**85**	**100**

Table 5 shows that though majority of faculty members 58 (68.24%) use personal computers, simultaneously they fairly use laptops 24 (28.24%) for the sake of information retrieval. It is interesting to note that 3 (3.53%) of the respondents are use other ICT devices such as Mobile etc.

Table 6: Duration of use of E-Resources a Day

S.No.	Duration	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Less than one hour	14	16.47	5	5.88	19	22.35
2	Between 1 to 2 hour	29	34.12	12	14.12	41	48.24
3	Between 2 to 3 hour	57	67.06	24	28.24	81	95.29
4	More than three hour	11	12.94	2	2.35	13	15.29

From the above Table 6, it shows that majority 81 (95.29%) of the faculty members use the e-resources between 2 to 3 hour, followed by 41 (48.24%) are for between 1 to 2 hour, 19 (22.35%) for less than one hour and 13 (15.29%) for more than three hour respectively in a day.

Table 7: Preference of Location for using ICT Devices

S.No.	Location	Male		Female		Total	
		No.	%	No.	%	No.	%
1	At home	28	32.94	14	16.47	42	49.41
2	Library	43	50.59	21	24.71	64	75.29
3	Personal chamber	37	43.53	17	20.00	54	63.53
4	Computer centre in campus	12	14.12	6	7.06	18	21.18
5	Any other places	9	10.59	4	4.71	13	15.29

Table 7 revealed that though majority of the faculty members preferably use ICT devices at University library 64 (75.29%), and personal chamber 54 (63.53%), half of the faculty members are preferably use ICT devices at their home. 18 (21.18%) of the faculty members are preferably use ICT devices in computer centre in campus and 13 (15.29%) other places such as internet centre etc.

Table 8: Use of Search Engines

S.No.	Search Engines	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Google	56	65.88	24	28.24	80	94.12
2	Yahoo	27	31.76	12	14.12	39	45.88
3	AltaVista	18	21.18	7	8.24	25	29.41
4	Google Scholar	7	8.24	2	2.35	9	10.59
5	Lycos	7	8.24	0	0.00	7	8.24
6	Others	14	16.47	5	5.88	19	22.35

Table 8 gives the details about the preferred search engines which the faculty members generally used to with. The finding reveals that Google is the most popular widely used i.e. 80 (94.12%), followed by yahoo 39 (45.88%) and AltaVista 25 (29.41%) and others type of search engine namely Scirus, MSN search etc. 19 (22.35%). It is interesting to note that, Google Scholar which has been recently discovered as one of the most scholarly used search engines for retrieving scholarly articles with their citation impacts is scantily used by the faculty members of SVU.

While analyzing the above table, it can be interpreted that Google and Yahoo search engines are commonly used search engines as compared to others.

Table 9: Preference of types of E-Resources

S.No.	E-Resources	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Course contents on bibliographic databases	33	38.82	15	17.65	48	56.47
2	Curriculum based books and full text journals in e-form	51	60.00	19	22.35	70	82.35
3	Teaching/Research related databases on Sciences	53	62.35	22	25.88	75	88.24
4	Case studies in e-form	24	28.24	13	15.29	37	43.53

It is evident from Table 9 that a great majority of respondents demand Teaching/Research related databases on sciences 75 (88.24%), and curriculum based books and full text journals in e-form 70 (82.35%). Thus it can be interpreted that 48 (56.47%) of the respondents are preferred course contents on bibliographic databases and Case studies in e-form 37 (43.53%).

Table 10: Preference of Forms of E-Information

S.No.	Forms of E-Information	Male		Female		Total	
		No.	%	No.	%	No.	%
1	e-Books	22	25.88	9	10.59	31	36.47
2	e-Journals	57	67.06	23	27.06	80	94.12
3	e-Articles	44	51.76	18	21.18	62	72.94
4	e-Dissertations and Theses	33	38.82	21	24.71	54	63.53
5	e-Newspaper	4	4.71	5	5.88	9	10.59
6	e-Reports	24	28.24	13	15.29	37	43.53
7	e-Patents/Standards	17	20.00	7	8.24	24	28.24
8	CD/DVD ROMs	21	24.71	9	10.59	30	35.29

Table 10 indicates that a great majority of faculty members of SVU prefer e-Journals 80 (94.12%) followed by e-Articles 62 (72.94%) and e-Dissertations and Theses 54 (63.53%). This implies that faculty members of SVU express their greater urge for online information to satiate their keen interest on teaching and research.

Table 11: Enhancement of E-Information Sources on Specific Areas

S.No.	Areas	Male		Female		Total	
		No.	%	No.	%	No.	%
1	General Science	34	40.00	16	18.82	50	58.82
2	Science and Technology	6	7.06	4	4.71	10	11.76
3	Medical Sciences	6	7.06	4	4.71	10	11.76
4	Others	13	15.29	2	2.35	15	17.65
Total		**59**	**69.41**	**26**	**30.59**	**85**	**100**

Table 11 shows that majority 50 (58.82%) of the faculty members express their views to enhance e-information sources and services on general science, 11.76% of the Science and Technology and Medical Sciences. It is interesting to note that, 15 (17.65%) of the respondents are enhancing others science (Environmental and Psychology etc.) of e-information sources and services.

Table 12: Users views on Fee-based E-Services

S.No.	Users Views	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Yes	32	37.65	15	17.65	47	55.29
2	No	21	24.71	9	10.59	30	35.29
3	May be	6	7.06	2	2.35	8	9.41
Total		**59**	**69.41**	**26**	**30.59**	**85**	**100**

Table 12 found that half of the respondents are in favor of fee based electronic information services. In some cases, it is found that certain relevant information resources in the full text forms are not available to the scientists. Probably in this situation, they have no hesitation to spend some money on buying these resources. Therefore, librarian of SVU library should be pro-active to asses such situation and should look forward to some feasible solutions.

Table 13: Awareness and use of Online Database

S.No.	Online Databases	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Web of Science	33	38.82	19	22.35	52	61.18
2	Science Direct	57	67.06	24	28.24	81	95.29
3	JSTOR	44	51.76	19	22.35	63	74.12
4	Springer	35	41.18	17	20.00	52	61.18
5	EBSCO	16	18.82	7	8.24	23	27.06
6	BIOSIS	36	42.35	13	15.29	49	57.65
7	Elsevier	27	31.76	12	14.12	39	45.88
8	CAB abstracts	17	20.00	7	8.24	24	28.24

It is evident from Table 13 that most of the faculty members are well aware of the premiere e-databases such as, Science Direct 81 (95.29%), JSTOR 63 (74.12%), Web of Science and Springer 52 (61.18%) and BIOSIS 49 (57.65%). Concurrently the awareness and use of other key databases like Elsevier 39 (45.88), CAB abstracts 24 (28.24%) and EBSCO 23 (27.06%).

Table 14: Use of E-Consortia and Digital Library Projects

S.No.	E-Consortia and Digital Library Projects	Male		Female		Total	
		No.	%	No.	%	No.	%
1	CSPO (Consortium for S cience, Policy & Outcomes)	51	60.00	19	22.35	70	82.35
2	UGC Infonet	23	27.06	10	11.76	33	38.82
3	E-Grantha	14	16.47	4	4.71	18	21.18

It is evident from Table 14 that more than three-fourth of respondents use CSPO (Consortium for Science, Policy & Outcomes) at the same time they use of UGC Infonet digital library consortium 33 (38.82%) and E-Grantha 18 (21.18%) are found less. It is obvious that SVU library being a member of CSPO, use of its resources among faculty members is genuine. However, use of open access resources such as E-Grantha is not so encouraging which needs to be promoted through librarian's special information literacy program among the learned faculty members and scientists of SVU.

7. **Major Findings:** The following is the summary of findings of the study:

- It is found that majority of faculty members (68.24%) use personal computers; simultaneously they fairly use laptops (28.24%) for the sake of information retrieval;
- It shows that majority (95.29%) of the faculty members use the e-resources between 2 to 3 hour, followed by (48.24%) are for between 1 to 2 hour;
- Majority of the faculty members preferably use ICT devices at University library (75.29%), and personal chamber (63.53%);
- The finding reveals that Google is the most popular widely used i.e. (94.12%), followed by yahoo (45.88%), it can be interpreted that Google and Yahoo search engines are commonly used search engines as compared to others;
- It is evident that a great majority of respondents demand Teaching/Research related databases on sciences (88.24%), and curriculum based books and full text journals in e-form (82.35%);

- The researcher found that a great majority of faculty members of SVU prefer e-Journals (94.12%) followed by e-Articles (72.94%) and e-Dissertations and Theses (63.53%). This implies that faculty members of SVU express their greater urge for online information to satiate their keen interest on teaching and research;
- The researcher found that half of the respondents are in favor of fee based electronic information services.
- It is evident that most of the faculty members are well aware of the premiere e-databases such as, Science Direct (95.29%), JSTOR (74.12%), Web of Science and Springer (61.18%) and BIOSIS (57.65%); and
- The researcher found that more than three-fourth of respondents use CSPO (Consortium for Science, Policy & Outcomes) at the same time they use of UGC Infonet digital library consortium (38.82%) and E-Grantha (21.18%) are found less.

8. **Suggestions:** In order to make online resources more useful and increase the usability by the faculty members of Sri Venkateswara University, here the following suggestions are required to be addressed;
   - In order to satisfy the faculty members need the e-resources are playing important role, so e-resource collection development is also very important;
   - E-resources must be made available to each department;
   - Internet connectivity and accessible download speed should be improved;
   - Provide training on information retrieval skills at all level which is appropriate to the individual needs of the students.
   - There should be a provision for proper evaluation of the feedbacks of Faculty members; and
   - The university library should conduct regular evaluation and assessment to determine the effectiveness of the subscribed online resources in meeting information needs of the users.

9. Conclusion

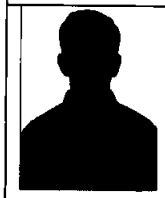
In the conclusion, it may say that e-resources are the most supporting tool in academic purpose for any faculty members. Faculty members in university moving towards flexible information resources in this direction E-resources opened a new world for user community. Realizing the needs of users Sri Venkateswara University took many initiations to enrich its E-resource collection and now it stands ahead of every university in Andhra Pradesh in terms of E-resource collection and usage. E-resources have made productive impact on the university teaching, learning and research community which can be understood by many studies conducted in this direction including this present study. Present study shown the better use of E-resources in Sri Venkateswara University and it is found further expectations from user community which can be considered by the executing authority in further enhancement process.

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Use of E-Resources by LIS researchers in India

Kamini Gupta



Sixteen thousand ninety five citations are used by LIS researchers for writing 1195 papers in three leading Indian journals under study. The period covered for the present study is 2002-2012. The number of papers (503) and number of citations (5806) are the maximum in SRELS Journal of Library and Information Technology. The number of e-citations (1505), %age of e-citations (28.65) and average e-citations per paper (3.94) are the maximum in DESIDOC Journal of Library and Information Technology. There are 3634 e-citations in total. However, overall percentage of e-citations and average e-citations per paper of all the three journals come out to be 22.58 and 3.4 respectively during the period under study.



E-resources, e-citations, ALIS, DESIDOC Journal of Library and Information Technology, SRELS Journal of Library and Information Technology.

1. Introduction

Advances in computer applications during the past few decades have brought radical changes in the way information is gathered, stored, organized, accessed, retrieved and consumed. The application of computers in information processing has brought several products and services to the scene. The internet and the web are constantly influencing the development of new modes of scholarly communication and their potential for delivering goods is quite vast, as they overcome successfully the geographical limitations associated with the print media. Further, the distribution time between product publication and its delivery has been drastically reduced. The internet can be used for efficient retrieval and meeting information needs. This is very important for university libraries since most of them call for more and more research work. This important fact is convincing many libraries to move towards digital e-resources, which are found to be less expensive and more useful for easy access. Electronic resources, mainly CD-ROMs, OPACs and internet, are replacing the print media. The present study is based on citations of the three leading Indian journals with special emphasis on e-citations used by the LIS researchers.

2. Literature Review

Ray And Day (1998) in their study showed that the students are increasingly expected to use electronic resources at university level. Sharma (2009) emphasized that the availability of e-resources in a university library is very common. But their proper and maximum use is a matter for discussion. The study also highlighted the preferences and importance of online resources among the teachers and research scholars.

Bajpai, Mal and Bajpai (2012) explained that the library environment is currently undergoing a rapid and dynamic revolution leading to new generation of libraries with the emphasis on e-resources. A lot of efforts have been taken in past few years to overcome this problem of financial crunch by resource sharing through consortia for university libraries. UGC-INFONET and INDEST-AICTE Consortium are the two major initiatives for university library users. These revolutionary steps are providing scholarly resources including peer reviewed journals, databases, abstracts, proceedings etc. These efforts must be a boon to university library users which will definitely boost the level of higher education system in our country.

3. Objectives

- To study the use of e-citations by LIS researchers in three Indian journals under study.
- To find out overall %age of e-citations and average e-citations per paper in each of these journals.
- To find out overall %age of e-citations and overall average e-citations per paper for these journals collectively.

4. Methodology

Three leading Indian journals, i.e. Annals of Library and Information Studies (Quarterly); DESIDOC Journal of Library & Information Technology (Bi-monthly) and SRELS Journal of Library and Information Science (Bi-monthly), published in the field of Library and Information Science have been taken for the present study. The period covered is 2002-2012. The findings of Rajgoli (2011) have been used in order to do further analysis and to reach at a particular conclusion. The citations appended at each article published in different issues of each volume of these journals have been used for analyzing the use of e-resources for the purpose of research work by the LIS researchers.

5. Analysis

Percentage and average e-citations in Annals of Library and Information Studies during 2002 to 2012 are revealed by table1 given below. The maximum (30.17) and the minimum (3.25) percentage of e-citations are in the years 2012 and 2005 respectively. Here the overall %age and average e-citations per paper during the period of eleven years come out to be 16.02 and 2.6 respectively.

Table 1: %age and average e-citations in Annals of Library and Information Studies

Year	Number of papers	Total citations	e-citations (%age)	Average e-citations per paper
2002	18	168	12(7.14)	0.67
2003	19	328	44(13.41)	2.32
2004	21	153	17(11.11)	0.81
2005	23	277	09(3.25)	0.39
2006	26	371	21(5.66)	0.81
2007	28	351	34(9.69)	1.21
2008	35	524	117(22.33)	3.34
2009	34	607	37(6.09)	1.09
2010	43	974	192(19.71)	4.47
2011	36	819	184 (22.47)	5.11
2012	27	464	140 (30.17)	5.19
Total	310	5036	807 (16.02)	2.6

Table 2: % and average e-citations in DESIDOC Journal of Library & Information Technology

Year	Number of papers	Total Citations	e-citations (%age)	Average e-citations per paper
2002	15	154	25(16.23)	1.67
2003	19	178	62(34.83)	3.26
2004	14	168	50(29.76)	3.57
2005	13	180	52(28.29)	4
2006	18	292	53(18.15)	2.94
2007	35	363	47(12.95)	1.34
2008	50	721	252(34.95)	5.04
2009	50	501	152(30.34)	3.04
2010	47	697	202(28.98)	4.29
2011	55	1012	178 (17.59)	3.24
2012	66	987	432 (43.77)	6.55
Total	382	5253	1505 (28.65)	3.94

Percentage and average e-citations in DESIDOC Journal of Library & Information Technology during 2002 to 2012 are represented by table 2. The maximum (43.77) and the minimum (12.95) %age of e-citations are in the years 2012 and 2007 respectively. However, overall % age and average e-citations per paper for the period of 11 years come out to be 30.34 and 3.04 respectively.

Table 3: % and average e-citations in SRELS Journal of Library and Information Science

Year	Number of papers	Total Citations	e-citations (%age)	Average e-citations per paper
2002	39	424	38(8.96)	0.97
2003	35	367	41(11.17)	1.17
2004	38	363	98(26.99)	2.58
2005	37	323	94(29.1)	2.54
2006	35	382	85(22.25)	2.43
2007	36	473	81(17.12)	2.25
2008	49	522	112(21.46)	2.29
2009	44	467	112(23.98)	2.55
2010	62	874	261(29.86)	4.21
2011	63	816	248 (30.39)	3.94
2012	65	795	152 (19.12)	2.34
Total	503	5806	1322 (22.77)	2.63

Table 3 given above reflects the %age and average of e-citations in SRELS Journal of Library and Information Science during 2002 to 2012. The overall %age and average e-citations per paper come out to be 22.77 and 2.63 respectively. The maximum %age-citations (30.39%) is in the year 2011 and the minimum (8.96%) is in the year 2002.

The %age and average e-citations of all the three Indian journals are shown in table 4 below. It is clear that number of papers (503) and number of citations (5806) are the maximum in SRELS Journal of Library and Information Science, where as e-citations (1505), %age of e-citations (28.65) and average e-citations per paper (3.94) are the maximum in DESIDOC Journal of Library and Information Technology. However, overall percentage and average e-citations per paper of these journals collectively come out to be 22.58 and 3.04 respectively during the period under study.

Table 4: % and average e-citations of Journals

Title of Journal	Number of papers	Number of Citations	e-citations (%age)	Average e-citations per paper
Annals of Library and Information Studies	310	5036	807 (16.02)	2.6
DESIDOC Journal of Library and Information Technology	382	5253	1505 (28.65)	3.94
SRELS Journal of Library and Information Science	503	5806	1322 (22.77)	2.63
Total	1195	16095	3634 (22.58)	3.04

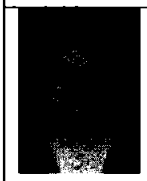
6. Findings and Conclusion

- In Annals of Library and Information Studies, total number of papers (43) and total number of citations (974) are the maximum in 2010, whereas % ages of e-citations (30.17) as well as average e-citations per paper (5.19) are the maximum in the year 2012. Here, the overall %age of e-citations is 16.02, whereas overall average e-citations per paper come out to be 2.6.
- In DESIDOC Journal of Library and Information Technology, total numbers of papers (66), %age of e-citations (43.77) as well as average e-citations per paper (6.55) are the maximum in the year 2012, whereas total number of citations (1012) is the maximum in 2011. The overall %age of e-citations and overall average e-citations per paper come out to be 28.65 and 3.94 respectively.

- In SRELS Journal of Library and Information Science, number of papers (65) is the maximum in 2012; %age of e-citations (30.39) is the maximum in 2011, whereas number of citations (874) and average e-citations per paper (4.21) are the highest in 2010. The overall %age of e-citations is 22.77, whereas overall average e-citations per paper come out to be 2.63.
- Out of all the four journals, the maximum papers (503) and maximum number of citations (5806) are in SRELS Journal of Library and Information Science. The total numbers of e-citations (1505), the %age of e-citations (28.65) as well as average e-citation per paper (3.94) are the maximum in DESIDOC Journal of Library and Information Technology.
- For all the four journals, 16095 citations are used by the researchers for writing 1195 papers. Out of these, 3634 are e-citations and average e-citations per paper come out to be 3.04. So it can be concluded that a researcher uses 3.04 e-citations to write one paper. Considering the advantages of usability, readability, affordability, accessibility, international reach, etc. of e-citations/e-resources, it can further be concluded that with the use of e-citations in research, there is also growth in the literature of Library and Information Science.

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User Satisfaction with Adequacy of Library Collection in Sree Vidyanikethan Engineering College Library: *A Study*

Kothapati Kumara **Swamy Reddy**

This study has been evaluating the users' satisfaction of Sree Vidyanikethan engineering college library collection. In this study most of the respondents are satisfied with the collection of books in the library. This paper reports the results of a survey of 290 users of an engineering college library.

User satisfaction, library collection, Engineering College Library

1. Introduction

Development, organization and management of a collection are essential for satisfying users need in all types of libraries. An academic Library does not exist for itself. Rather, it operates as a part of the Academia to fulfill the goals set forward by an educational or academic institution. As such, the syllabi, curriculum and plans of the institution exert a direct influence in its function. An Academic Library should become a teaching instrument in itself. It must give priority to library services for students' satisfaction. Primary importance should be given to the text books for students along with other reference materials. Again, there is a greater need for book collection and other documents as per the suggestions made by the lecturers. Students primarily approach the library for prescribed texts in the course syllabus. The next concern of the students, especially in case of higher educational institutions, comprises chiefly the reference books and relevant Journals. So, academic library must be given importance to its collection of text books, reference books and Journals.

2. Objectives

- To find out satisfaction of the users with the adequacy of the collection of text books and reference books in the library.
- To find out whether journals and news papers subscribed by the library are adequate.

3. Methodology

The questionnaire method was adopted for this study. The questionnaires consist of only open questions. The questionnaire was personally distributed among the users as a sample study by the library users. A total number of 300 questionnaires is distributed and 290 questionnaires were received properly. The collected data was analyzed both quantitatively and qualitatively by the users' satisfaction of the collection of resources at Sree Vidyanikethan Engineering college library.

4. Data Analysis And Interpretation

Satisfaction of users with regard to adequacy of library collection consisting of text books, reference books, Journals and newspapers is described in the following paragraphs.

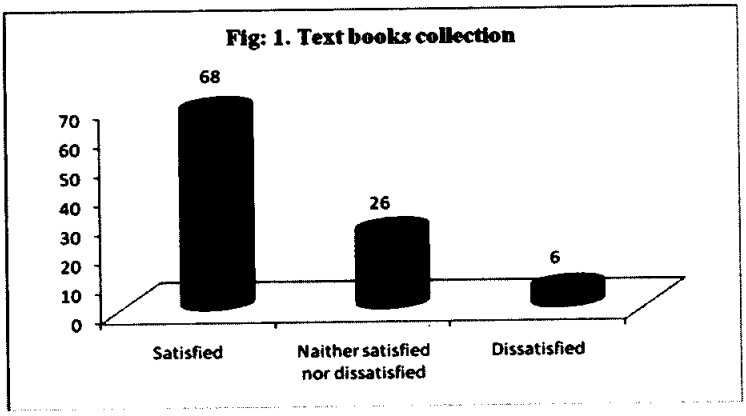
- **Text books collection:** The distribution of users according to their satisfaction with adequacy of text books collection is shown in Table 1 and diagrammatically in Fig.1

Table 1: User satisfactions with adequacy of text books collection (in percentage)

Satisfaction	Courses			Gender		Total
	B.Tech	M.C.A.	M.Tech	Male	Female	
Satisfied	70.9	62.9	51.4	68.8	64.7	68
Neither satisfied nor dissatisfied	24.5	25.7	40	25.3	29.4	26
Dissatisfied	4.6	11.4	8.6	5.9	5.9	6
Total	**100 n = 220**	**100 n =35**	**100 n =35**	**100 n =205**	**100 n =85**	**100 n =290**

X^2 (B.Tech - MCA) : 2.9028 df : 2 TV : 5.991 NS at 0.05 level
X^2 (B.Tech - M.Tech) : 5.9014 df : 2 TV : 5.991 NS at 0.05 level
X^2 (MCA - M.Tech) : 1.6298 df : 2 TV : 5.991 NS at 0.05 level
X2 (Male – Female) : 0.5181 df : 2 TV : 5.991 NS at 0.05 level

Fig: 1. Text books collection



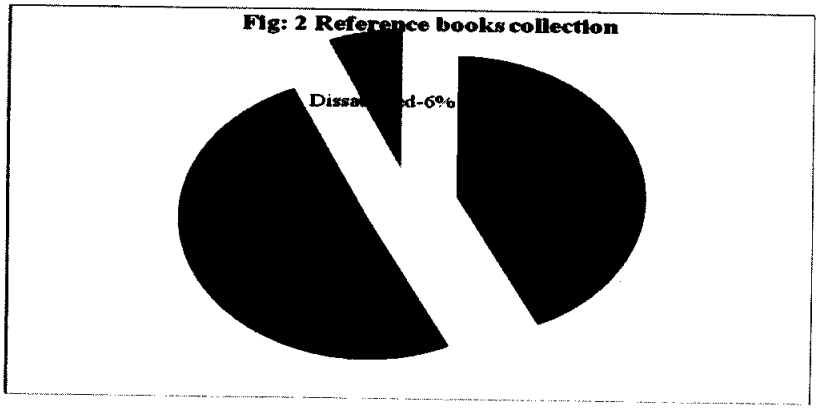
It is evident from Table 1 that the most of the users (68%) are satisfied, and 26 percent are neither satisfied nor dissatisfied and 6 percent are dissatisfied with regard to the adequacy of the collection of the text books. It is evident from Table 1 that there are no significant differences among the various groups of students satisfied with adequacy of the collection of text books as proved by Chi-square values which are not significant at 0.05 level with the two degrees of freedom.

- **Reference books collection:** The distribution of users according to their satisfaction with the adequacy of reference books collection is shown in Table 2 and diagrammatically in Fig.2

Table 2: Distribution of users according to their satisfaction with adequacy of reference books collection (in percentage)

Satisfaction	Courses			Gender		Total
	B.Tech	M.C.A.	M.Tech	Male	Female	
Satisfied	48.1	28.6	22.9	43.9	40	43
Neither satisfied nor dissatisfied	47.3	54.3	68.6	51.2	49.4	51
Dissatisfied	4.6	17.1	8.5	4.9	10.6	6
Total	**100 n = 220**	**100 n =35**	**100 n =35**	**100 n =205**	**100 n =85**	**100 n =290**

X^2 (B.Tech - MCA) : 10.4977 df : 2 TV : 9.210 Sig at 0.05 level
X^2 (B.Tech - M.Tech) : 8.0209 df : 2 TV : 5.991 Sig at 0.05 level
X^2 (MCA - M.Tech) : 1.8036 df : 2 TV : 5.991 NS at 0.05 level
X2 (Male – Female) : 3.2430 df : 2 TV : 5.991 NS at 0.05 level



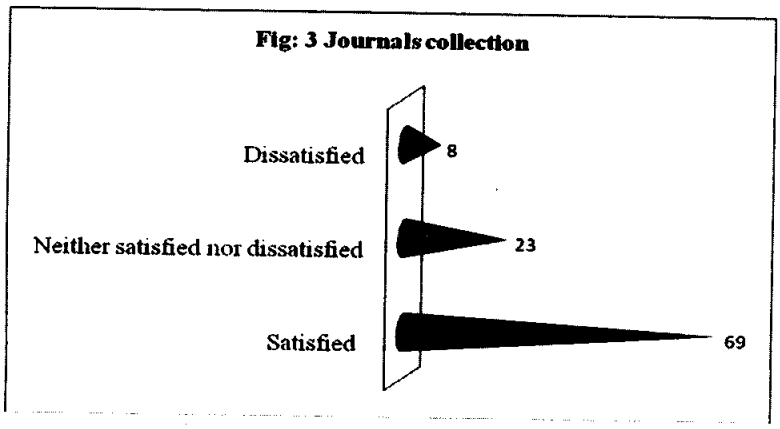
It is evident from Table 2 that most of the students (51%) are neither satisfied nor dissatisfied with adequacy of reference books collection, 43% of them are satisfied and 6 percent of them are dissatisfied. It is also evident from it that there are significant differences in satisfaction with adequacy of the collection of references between the students of B.Tech and MCA, B.Tech and M.Tech. It is proved by Chi-square values which are not significant at 0.05 level with two degrees of freedom.

- **Journals collection:** The distribution of users according to their satisfaction with adequacy of Journals collection is shown in table 3 and diagrammatically in Fig.3

Table 3 User satisfaction with adequacy of Journals collection (in percentage)

Satisfaction	Courses			Gender		Total
	B.Tech	M.C.A.	M.Tech	Male	Female	
Satisfied	76.8	54.2	34.2	69.1	68.3	**69**
Neither satisfied nor dissatisfied	14.5	40	62.9	23	24.7	**23**
Dissatisfied	8.7	5.8	2.9	7.9	7.0	**8**
Total	**100 n = 220**	**100 n =35**	**100 n =35**	**100 n 205**	**100 n =85**	**100 n =290**

X^2 (B.Tech - MCA) : 13.2385 df : 2 TV : 5.991 Sig at 0.05 level
X^2 (B.Tech - M.Tech) : 42.2628 df : 2 TV : 5.991 Sig at 0.05 level
X^2 (MCA - M.Tech) : 3.6918 df : 2 TV : 5.991 NS at 0.05 level
X2 (Male – Female) : 0.1345 df : 2 TV : 5.991 NS at 0.05 level



It is evident from Table 3 that most of the students (69%) are satisfied with adequacy of the collection of journals collection, 23 percent are neither satisfied nor dissatisfied and 8 percent are dissatisfied. It is also evident from it that there are significant differences in satisfaction with adequacy of journals collection between the students of B.Tech and MCA students, and B.Tech and M.Tech students. It is proved by Chi-square values which are significant at 0.05 level with two degrees of freedom.

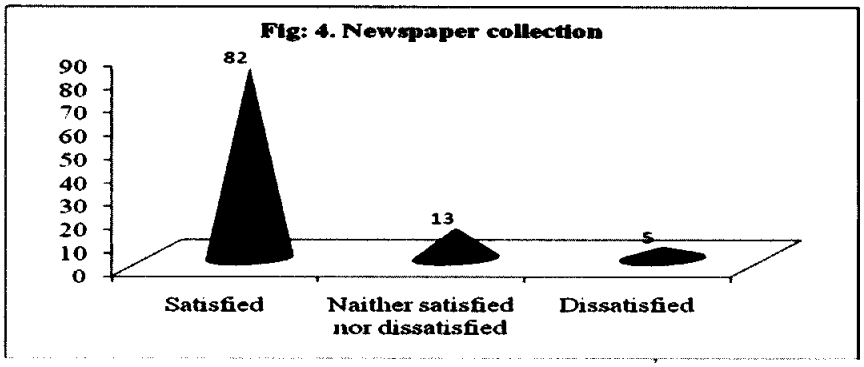
It can also seen from Table 3 that there is no significant difference in satisfaction with adequacy of journals collection between the male and female students and MCA and M.Tech students as indicated by the Chi-square value which are not significant at 0.05 level with two degrees of freedom.

- **Newspaper collection:** The distribution of users according to their satisfaction with the adequacy of collection of newspapers is shown in table 4 and diagrammatically in Fig. 4.

Table – 4 User satisfactions with the adequacy of newspaper collection

Satisfaction	Courses			Gender		Total
	B.Tech	M.C.A.	M.Tech	Male	Female	
Satisfied	86	77.1	62.9	86.2	71.8	**82**
Neither satisfied nor dissatisfied	10	17.1	28.6	9.8	21.1	**13**
Dissatisfied	4.0	5.8	8.5	04	7.1	**5**
Total	**100 n = 220**	**100 n =35**	**100 n =35**	**100 n =205**	**100 n =85**	**100 n =290**

X^2 (B.Tech - MCA) : 1.8616 df : 2 TV : 5.991 NS at 0.05 level
X^2 (B.Tech - M.Tech) : 11.5262 df : 2 TV : 9.210 Sig at 0.01 level
X^2 (MCA - M.Tech) : 1.7102 df : 2 TV : 5.991 NS at 0.05 level
X2 (Male – Female) : 8.7764 df : 2 TV : 5.991 Sig at 0.05 level



It is evident from table 4 that most of the users (82%) are satisfied with the adequacy of newspaper collection. It is also obvious from it that 13 percent are neither satisfied nor dissatisfied and 5 percent are dissatisfied.

It can also be seen from it that the students of B.Tech, MCA and M.Tech students do not differ significantly from one another in satisfaction with regard to the adequacy of newspaper collection. It is indicated by the Chi-square values which are not significant at 0.05 level with the two degrees of freedom. There are significant differences between the male and the female students and B.Tech and M.Tech students in satisfaction with regard to the adequacy of news paper collection as evidenced by Chi-square values at 0.05 level with two degrees of freedom.

4 Findings of the Study: The major findings of the study are:

- Most of the users (68%) are satisfied with the adequacy of text book collection. A few users (6%) are dissatisfied.

- Students of the faculty of Engineering, M.C.A and M.Tech do not difference in satisfaction with adequacy of text book collection.
- There is no significant difference in satisfaction with adequacy of text book collection between the students of male and female.
- Majority of the students (69%) are satisfied with the adequacy of the collection of journals. 23 per cent are neither satisfied nor dissatisfied and more or less same percentage (8) students are dissatisfied.
- There are significant differences in satisfaction with the adequacy of the collection of journals between B.Tech and MCA students, and B.Tech and M.Tech students.
- There is no significant difference in satisfaction with the adequacy of the collection of journals between the students of male and female.
- Most of the students (51%) are neither satisfied nor dissatisfied with the adequacy of the collection of references. 43 per cent of students are satisfied and as well as dissatisfied.
- Students of the faculty of Engineering, M.C.A and M.Tech do not differ significantly from one another in satisfaction with the adequacy of reference collection.
- There is no significant difference in satisfaction with the adequacy of reference collection between the male and female students.
- Most of the students (82%) are satisfied with adequacy of news paper collection.
- There are significant differences between male and female students, and B.Tech and M.Tech students in satisfaction with regard to adequacy of news paper collection
- There is no significant difference in satisfaction with the adequacy of news paper collection between the male and female students.

5 Conclusion

The main purpose of any library is to provide relevant and up- to-date materials with a view to satisfy the information needs of the users. Based on the findings, it is clear that the library users are satisfied with the adequacy of library collection in Sree Vidyanikethan Engineering College Library.

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