Library & Information Science in the Digital Era

55th All India Library Conference Proceedings
Birla Institute of Management Technology
Greater Noida
January 21-24, 2010

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Sh. D.V. Singh

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Dr. O.N. Chaubey
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INDIAN LIBRARY ASSOCIATION, DELHI

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2010

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PREFACE

We feel it a great pleasure in presenting the pre-conference papers volume of 55th All India Library Conference being held at Birla Institute of Management Technology, Greater Noida.

In the current scenario, Information is exploding so furiously around us and information technology is changing at such bewildering speed that we face a fundamental problem: How to orient ourselves in the new landscape? Each change in the technology has transformed the information landscape, and the speed-up has continued at such a rate as to seem both unstoppable and incomprehensible. Technological changes have reshaped the information landscape, but libraries as social institutions have not been able to transform themselves to keep pace. This is the challenge of Library and Information Science Education. LIS today is enveloped in a multicultural context. Considering the challenges faced by the profession as a whole, the Indian Library Association decided to organize 55st All India Library Conference on the emerging theme "Library and Information Science in the Digital Era."

The overwhelming response received from the LIS professionals has been extremely satisfying and encouraging. The Editorial Committee reviewed them and short-listed 97 papers for publication. The volume is organized into fifteen sub-themes arranged under eight technical sessions which are as follows:

Technical Session I

Sub Theme: Changing Role Library and Information Professionals & Library Leadership and Communication

This section has 11 papers on the various components of the sub-themes viz. Open Access Resources, Institutional Repositories, total quality management, Creation Of Data Base, and Changing role of library and information professionals, Eleven papers have been included in this section on the various topics of sub-themes viz.

Technical Session II

Sub Theme: Collection Development and Access Management Information Processing and Knowledge Organization & Information and Knowledge Management

Eleven papers have been included in this section on the various topic of the sub-themes viz. Information Processing Knowledge Organization Knowledge Management, collection development in the digital era etc.

Technical Session III

Sub Theme: Library Consortia and Institutional Repositories Content Creation and Content Management Systems & Digital preservation, metadata and standardization

This section has twenty three papers on diverse areas of the sub-themes viz. consortia, repositories, creation of metadata, content development, digital preservation, standardization methods etc.

Technical Session IV

Sub Theme: Information Use and Information Seeking Behaviour & The Internet based Resource and Services

Twenty papers under this section discuss Resource and Services available from Internet and various aspects of information seeking behavior of users etc.

Technical Session V

Sub Theme: Marketing of Library Services

Eight papers are presented under this sub-theme. This section discusses various aspects of marketing of Library Services and information products.

Technical Session VI

Sub Theme: Legal and Ethical Issues Surrounding Library Profession

Two papers are presented under this section. This section discusses economics of information, Information security and planning of information security.

Technical Session VII

Sub Theme: Open Source and Quality Assurance

This sub-theme has seven dealing with various topics of open source initiatives, open source movement and open source software and their applications in libraries.

Technical Session VIII

Sub Theme: LIS Education, Research and Training & Personal and Professional Competencies

This section has fifteen papers under the above sub-themes. These papers discuss about LIS education in the digital area, importance of research and training, research and development activities in LIS etc.

We feel that despite the best efforts of the Editorial Committee, we could not do full justice to the volume. This is mainly because paucity of time and as usual a large number of papers were received. The Editorial Advisory Board gratefully acknowledges the contributors and all those who have extended their cooperation in bringing out the volume in time. We are thankful to M/s Om Laser Printers, Delhi who have done tedious efforts in page designing and printing the volume in a presentable manner in a short span of time.

We hope the papers in this volume will be of immense use not only for Library and Information Science Professionals, but also others who are interested in library and information literacy.

We trust the discussions during the Conference will lead to a fruitful exchange of ideas and these proceedings will prove to be a useful collection of the description of the state o the art practices in library and information centres.

Sh. D. V. Singh
Chief Editor

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Changing Role of Libraries in Digital Age: An Overview

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ABSTRACT

Libraries to-day is no longer visualized as cluster of formidable-looking walls and shelves housing innumerable treasures of knowledge. Rather, they are now wall-less and have transformed and evolved themselves to be better suited to the demands and needs of the changing times. With the tremendous growth of the Internet, e-learners have access to an overwhelming range of information sources available at the click of a mouse. Computer can solve the requirements of the present trend. As technologies evolve and better it, it is only normal that libraries change themselves to adapt to the standards of the times and consolidate their positions by incorporating the latest technologies. Now the term-Librarians are stock custodians changes as information custodians. Hence, in this paper we hereunder discuss the uses, search methodologies, technologies, creations, innovations, requirements, budget and implementation of digital libraries for future.

Keywords: Digital Libraries, wall-less, information custodians, innovations.

INTRODUCTION

Due to variety of information needs, shrinking budget and information technology has changed the scenario of the library and information centre. Libraries are modernizing their services and structure to fulfill the need of the users. To cope up with these problems libraries have been converting as Digital Libraries. Digital Library is a library in which a significant amount of the resources are available in machine-readable format. The digital contents may make at locally and accessed remotely through computers. This new form for information sources are developed in these decades. The Digital Libraries as they are conceived to-day have been developed only since 1990's.

The Digital Libraries are called in the name of electronic libraries also. In 1960's, Licklider (1965) imagined the 'library and the future' and outlined the characteristics of future libraries. Moores and etal.(1968) have contributed substantially to develop the present day digital library. Digital Libraries can instantly adopt innovations in technology providing users with improvements in electronic and audio book technology as well as presenting new forms of communication such as wikis and blogs.

WHAT IS DIGITAL LIBRARY?

Digital Libraries Federation (DLF) has defined "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, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities."

According to Paul Duguid "Digital library as an environment to bring together in support of life cycle of information in addition to digital collection and information management tools"

DIGITAL LIBRARY TECHNOLOGIES

In particular, the importance of understanding the human and social context while carrying out technical work remains the heart of all work in digital libraries

The basic technologies involved in Digital Libraries are

- Open architectures (open DLs)
- Componentized V/s Monolithic systems
- Interoperability (role of Z39.50, OAI etc.)
- Unified interface for heterogeneous libraries
- Metadata mapping across different libraries
- OAI –compliant data and service providers
- Multilingual digital libraries
- Scalable digital library architectures

- Publications tools
- Searching tools

USES OF A DIGITALIZED LIBRARY

**No physical boundary:* The users of a digital library need not to go to the library physically; people from all over the world can gain access to the same information, as long as an internet connection is available.

**Round the clock availability:* A major advantage of digital libraries is that people can gain access to the information at any time, night or day.

**Multiple accesses:* The same resources can be used at the same time by a number of users.

**Structured approach*: Digital libraries provide access to much richer content in a more structured manner, i.e. we can easily move from the catalog to the particular book then to a particular chapter and so on.

**Information retrieval:* The user is able to use any search term bellowing to the word or phrase of the entire collection. Digital libraries can provide very user-friendly interfaces, giving clickable access to its resources.

**Preservation and conversation:* An exact copy of the original can be made any number of times without any degradation in quality.

**Space:* Whereas 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 them. When a library has no space for extension digitization is the only solution.

**networking:* A particular digital library can provide a link to any other resources of other digital libraries very easily; thus a seamlessly; integrated resource sharing can be achieved.

DIGITAL LIBRARY CREATIONS

There are 5 stages in building digital libraries. There are

- ✓ Selection of documents and scanning
- ✓ Storage & Management
- ✓ Search & Access
- ✓ Distribution , and
- ✓ Rights management.

In digital library parlance, duplicating the printed publications into digital format is called 'retrospective conversion'. While creating the printed information is called 'e-publishing'.

The holdings in a digital library are called 'items 'or 'objects' which contains data or the 'content that is stored in the form of 'repositories'. The description of the stored data/information is known as 'metadata' or 'properties' of that data. Almost every type of information can be represented in digital form including text, pictures, music, computer programs, databases, models, video, and a combination of any of the above. Every digital 'object needs to be identified by a name, a time stamp and the owner, so as to establish the legal ownership.

In the past, a major problem with digital library implementation was a need to deal with a variety of computer hardware owned by different users. To-day, the web has defined the standard interface, which everyone must support. Some models of digital library involve scanning of printed principle, much of the image-scanned material can be converted through Optical Character Recognition (OCR), but there is still other material, which are provided as images and which may be hard to search. With the advent of new technologies and standards, the various conversion problems that we face to-day may disappear in future.

REQUIRED STANDARDS FOR DIGITAL LIBRARY

Since information comes in different forms such as plain text, images/pictures, sound recordings and video films, we need to select the most appropriate file format to create and store. Unlike traditional libraries, which use simple standards of classification, cataloguing and indexing such as UDC,DC,LC, AACR2,and ISBD; standards for creating digital libraries are more technical and complex. Hence it becomes essential to adopt various international standards for the creation, storages and delivery of digital information.

There are various file formats to store each type of data. For example postscript & PDF for page description: TIFF, JPEG, GIF, PNG and PCD for images: HTML, XML, & SGML for structured documents: AU, MP3 WAV, RAM and MIDI for audio, ect., The Digital Library Federation (DLF) recommends standard naming conventions data about date. Various National and International agencies are involved in developing standards for representing electronic documents, such as digital library federation, W3 consortium ect.,

Meta data formats such as Dublin core, MARC, IAFA,TEI and GILS, describe an object in a standardized format that in by using the Warwick frame work interchange can be brought together and appended to the on line document.

The next step in creating a digital library is the actual scanning (or converting the text/image into digital format) of printed documents, which is most laborious and time-consuming with the special scanners are available in the market. The commercial digital library software

available in the market can be done all the jobs right from scanning to hosting the content on the web.

It is believe that access to any digital library on the internet is expected to create great demand on the storage space and network bandwidth. Hence, it is recommended that these digital data bases be hosted on powerful, high-end computers with plenty of memory and hard disk capacities in excess of 1 Terabyte and connected to a high-speed optical fiber network. If necessary, separate computers may be used to store different digital objects and then interlinked, so that the load on the main web server is minimal.

CHANGING ROLE OF LIBRARY PROFESSIONAL IN DIGITAL AGE

The ready availability of information on the Internet, and its widespread use, really presents Librarians with an opportunity, not a threat. Technology Savvy users realise they need help, which Librarians can provide. Librarians now face difficulties and complicity challenges due to new trends in information access.

In the present technological/Internet era the professionals have to change themselves as the information profession is being changed. Now information specialists have to work as e-information resources in which various professional groups are expected to map strategies that lead to produce, manage, maintain and service the information. Information professional has to work as:

Librarian- In addition to being library manager, they also act as collection development, technical processors and so on, taking care of information quality.

Information Manager- To meet information need of the user they should know how to manage and deliver appropriate information services.

Information adviser/instructor- Ensure that user/staff know how to access relevant sources of information (literacy).

System & Networking- For delivery of information to their users in an appropriate manner develop and design appropriate systems.

SKILLS, KNOWLEDGE, COMPETENCIES REQUIRED FOR LIS PROFESSIONALS

The basic goal of library and information profession has always been to provide access to information to those who need it. The activities realizing this goal have evolved and transformed over the years. This includes - Available technology, and need of an evolving information society. Information activities have been guided by the developments in

the field of storages, presentation and archiving of knowledge, collection development and organization of knowledge, information explosion and computers in information retrieval. Librarian and information professional involved in information gathering, storage, retrieval and dissemination on one hand and on the other hand the computer specialists who supports the library and informational professionals in this endeavor. For successful implementation of Digital Library, it is essential that LIS professionals are well trained and possess requisite knowledge and skills in this respect.

I) - Knowledge & Skills

Librarians need to know understand –

- Knowledge resources (books, journals, i.e. resources, Internet)
- Teleological facilities and resources (computer, online catalogues, websites, LANs file servers etc.)
- Financial resources (Budget) Human resources (Skills for manpower training)

II) - Competencies that required possessing in LIS professional:

- Acceptance of change.
- Knowledge of user interaction with knowledge resources.
- Provide quality service.
- Be adoptive, flexible and resistant.
- Be resourceful
- Posses excellent communication skills, constantly update personal knowledge base by keeping in touch with the latest development
- Create awareness among the users, make them accept the changes
- Be an information management strategist, etc.

III) - Technical Knowledge required:

- Operating systems - Windows, UNIX, LINUX.
- World processing, Graphics, Spread sheet & Presentations.
- Database Management Systems 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 and Internet.
- Library software packages, acquaintances with Digital Library Tools.

CONCLUSION

The world of information is undergoing rapid change. An information age at a great turning point in the history of civilization. The day has arrived when it is most important to learn to access, analyze apply and evaluate such information. As traditional custodians of information, librarians need to be aware of the implications of these changes and develop technological and managerial skills, which will enable them to make effective use of information and to meet their organizations changing information need.

The role of librarian has changed 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 required 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 from the clientele in the new environment.

Digital age has brought a tremendous change in the way information is stored and accessed. This has brought about a change in the concept of librarian, their collection and services. Many new terms viz. Digital Librarian, Libraries without walls, virtual libraries, are emerging to describe the libraries of digital age.

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Changing Role of Library and Information Professional

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ABSTRACT

Today, the walls of a library are giving way to digital environments to establish the links with information and virtual. Information is a valuable resource. For the better management of vast information resources, LIS Professionals needs are to be updated by latest technological innovations. If this part is neglected or ignored, tomorrow is coming soon to make us helpless and library will become the meaningless institution in the computer age. According to Martin Luthar "When you rest you rust". The paper describes about the roles performed by the LIS Professionals in Digital Era and the methods through which they can improve their knowledge as well as methods of work so that they can also manage to live in that computer age.

INTRODUCTION

The information technology or IT is revolutionizing the way, in which we live and work. The IT has changed all aspects of our life and lifestyle. The digitization has given mankind the ability to treat information with mathematical precision, in order to transmit it at very high accuracy and to manipulate it at will. Due to IT a whole world will develop within and around the physical world.

A few decades back communication used between people – one person to another. But now a days inanimate objects are getting into the act – books can tell the cash registers how much they cost, identity cards can tell the door look whether to open or not, automated guided vehicles can tell the host computer where they are in the shop floor and what they are carrying and when they will be free, missiles can compare the landscape with their own map and hit the target with pin – point precision, on the Internet people engaged in lively charts and discussions, play games even if they are in physically in different continents. Information technology has revolutionized the information managing activities in the libraries during the past few years. The Information Society demands

that all the relevant technologies; that are involved in information processing, consolidation, repackaging and retrieval be merged so as to evolve an integrated system; capable of providing diversified services. [1]

It is only IT basing on which, the information Professionals have turned themselves as Information Architecture, Information Specialist, Information Scientists, Marketing Officer, Knowledge Manager and Web Designer etc.

DIGITAL ENVIRONMENT

It is obviously that, information technology predict about the bad conditions of the libraries. There was release of Vannevar Bush's seminar paper of 1945. But it seems that these predictions are inversely proportional to the predictors' professional habitual use of published information. There is lack of appreciation of libraries especially in the realm of digital information resources. Overall libraries are not thought as the lifeblood and substance of scholarly, inquiry, and endeavor. So to some extent the question of what is a library anymore could be one about which "If you have to ask the question, you would not understand the answer. Our intention is to attempt the answer anyway." This intention is inspired on the remarks of Gerhard Casper, then president of Stanford, at the 1999 rededication of the restored central campus library, "WHO NEEDS A LIBRARY, ANYWAY."

If we take view in the past we found that libraries in the past had only written or printed documents. These documents include periodicals, thesis, reports, reference materials, patent standards, and etc. Libraries have traditionally been considered as storehouses of various kinds of macro – documents, shelves in a linear, apparently useful, but pre – coordinated. In the past the volume of information was not as large as it happens today and the libraries were in the position to organize the information material through manual operation. But after the Second World War, large number of non – book material also started entering the libraries. These included microforms, audio – visual aids etc. advent of computer brought in several other document like tapes, floppies, DVD, database on CDs etc.

IMPACT OF DIGITAL ERA ON SOCIETY

The impact of Knowledge-based society can be seen separately in the following areas: [2]

2. LIS PROFESSIONALS CAPACITY BUILDING

New technology may call for organizational change in the traditional library. Librarians may have to function more like consulting information engineers than as the traditional, passive custodians of information and dispensers of documents, moving from a collection-centered model to one that is access- and service-

oriented. Ranganathan's fifth law of library science tells us about the ever-growing nature of libraries.[3]

a) Present status of Library Science Education

Currently about Eighty Seven (87) universities offers Bachelors/Masters degree programme in LIS, Eleven (11) universities offer M.Phil, Thirty Two (32) Universities have provision for doctoral degree. Besides these, DRTC, Bangalore and NISCAIR, New Delhi, offer specialized programmes in Information Science leading to the award of associateship in information science. These two courses have been recognized by govt. of India as equivalent to Masters Degree. In addition, there are open universities which offer LIS programmes through distance mode. In other words, we have nerealy one hundred fifteen (115) LIS schools and institutions offering education and training at six different levels: Certificate, Diploma, Undergraduate Degree, Masters Degree, M.Phil and Ph.D.[4]

b) Manpower and Training

In the present day manpower training is essential to update the knowledge in IT environment. Training of working library professionals in library science and technology should be given due to consideration on regular basis. The rapid technological changes have brought about the need for skilled manpower to run modern libraries and to transform the existing libraries. Training courses in computer applications, networking and inter-leading will have to be organized by networks. In India few centers are conducting IT training programs, are NISCAIR, NISSAT, INFLIBNET, DRTC, UGC, etc and many other government institutions have been supporting the training of library professionals.

c) New Perspectives in LIS Education

The advent of IT has resulted in globalization of Library Education. There is infusion of new subjects namely, psychology, statistics, linguistics, management and science into the arena of LIS. This has enlarged and enriched the theoretical base of the LIS education.

Prolonged period of education brings status and prestige to the profession. The long period enables the decision makers to incorporate new subjects into the curriculum.

Of late, community oriented library services are given more importance. The recent national seminar held at connemarea Public Library throws light on this aspects.[5]

d) Impact on the LIS Schools

In the present day Knowledge society, the education is converted towards commercialization. There is an urgent need for imparting

quality education and training by the Indian library and information science schools, so that the products of these schools can comfortably fit to manage the modern library and information centers and these can survive in the global market.

CHANGING ROLE OF LIS PROFESSIONALS

Every one knows that informational professionals were playing very imp roles in organizations since immemorial time. It is very difficult to define their permanent role because their roles were changing time to time according to the demand and objectives of an organization to cope up with new era which is full of new as well as advanced technologies.

1. Role of Library and Information Professionals as Information Architecture

Information Architecture actually means "the process of structuring and organizing information so that it is easier for users to find and for owners to maintain". Librarians can help in the design of technology based services and share their intimate knowledge of what user wants and needs.

Mike Steckel linked Ranganathan's five laws of library science to the field of information architecture: [6]

a) ***BOOKS ARE FOR USE***

Websites which are developed as well as maintained are only for use, they are not any kind of touch me not thing like statue or temple to admire from distance. Library professionals want their users to use or interact with these websites and utilize these according to their needs.

b) ***EVERY READER HIS/HER BOOK***

In the sense of modern technology 'each piece of content has its user' and 'each user has his/her content.' It means that we have to keep the specific need of users in our mind before adding the content in the website. On the other hand we have to be sure that the readers can find the content as per their need.

c) ***EVERY BOOK ITS USER***

Treating the book as "unique one", a particular website has been developed. The role of the website is to convey each and every book in the lap of the reader.

d) ***SAVE THE TIME OF THE READER***

When we talk about the website, the front end component as well as the back end component should be structured in such a manner that it can't waste the time of users. It means LIS Professionals should ensure that every reader his/her looks for and our data are structured in such a way that these should be receptive and accommodative.

e) ***LIBRARY IS A GROWING ORGANISM***

It is the demand of present era that we have to keep our own skill levels moving forward because our users and our resources are also changing. Consequently services will grow and change over time.

2. **Library and Information Professionals as an Information Scientist**

Information Scientist's play a very important role in the maintenance and development of the information centres. On the other hand they also create new mode of services and try to maintain as well as modernize the library according to the new technology. And the most important thing is that they provide user – friendly environment in the library.

3. **Library and Information Professionals as an Information Specialist**

Information Professional's work as an Information Specialist is by organizing and designing an efficient teaching environment. They work with teachers to plan, conduct and evaluate teaching learning activities. They practices appropriate business and management approaches to communicate the importance of information services.

4. **Library and Information Professionals as a Marketing Officer**

Availability of right information for the right user at the right time at the right cost has become most vital. This is the major challenge for LIS professionals. LIS professionals understand that just having information and storing is of no use or purpose, unless it is put to an effective use by those who need it. LIS professionals will have to bring the users and the information together which can be successfully done by the marketing of information products and services. Today there are many ways to put marketing programme by keeping on-line bulletin boards and displaying the new acquisition on the internet.

5. **Library and Information Professionals as a Knowledge Manager**[7]

Knowledge Management means "The Right Knowledge, In Right Place, and At the Right Time."

A knowledge manager should be able to organize the multiple pieces of information by collection of books, publications, documents, audio-visual aids, databases in computer and other reference materials for convenient access in a systematic way.

They should be able to extract, filter and disseminate vital knowledge and work side by side with users in collecting and analyzing strategic intelligence.

6. Role of Library and Information Professionals in Internet

The internet and www are very powerful tools. They are playing their vital roles in the change not only in librarianship but also in daily life as well. Library and Information Professionals roles in internet are as:

a) The newly arrived books list is prepared and displayed on internet

b) Library's some important events like book exhibition; book talk, library week, librarian's day etc are announced on the internet.

c) With the help of Internet the professionals also get feedback from users on library services and sources.

d) The most important thing is that with the help of OPAC users can access the bibliographic details of library resources at computers with in the library and even from homes.

e) Due to Internet professionals can send reminders to overdue books vie-a-email

f) Resource sharing is also possible.

7. Library and Information Professionals as a Researcher

Those LIS professionals who are undergoing research work are treated as library information research scholars. Their main aim is to reach on new innovation and new findings in the sphere of LIS. This research work leads the scholars into the depth of the knowledge of LIS. In long run it fulfills basically the aim of society as well as the goal of nation.

8. Library and Information Professionals as a Facilitator

It has been observed that users or readers of the library and especially scholar under going research works require an easy access to get the suitable material of their specific field without wasting any glimpse of time. Here LIS professionals are present at each and every corner with suitable information and documents to provide the user of the library.

9. Library and Information Professionals as an E-Resource Manager

Today library professionals play an important role in ensuring that they and their home institutions are well stocked and well equipped to feed their users well.

10. Library and Information Professionals as a Trainer

The users are the client of the professionals. We know that we are living in digital era and every one of us is fond of using internet, www and search engines. But it is not necessary that everybody knows how to use these technologies which are available in the library in order to gather information. Here the LIS professionals' responsibility is to educate the users or train the users and make boost the users to visit the library regularly, so that they can get the right information at the right time from the right sources.

11. Library and Information Professionals as a Manager

LIS Professionals as a manager needs to be in strategic planning so that they will be able to stay abreast of the changes in order to make best decision at any given point of time. Although libraries are the centres for information, the professionals should have acquired management skills, so that the interpersonal relationship should be maintained.

12. Library and Information Professionals as a Teacher

LIS Professionals has a vital role in the Digital era. Information professionals are the teachers for their client, who orient and teach them how to gather the correct information and how to use the various techniques to save their time.

CONCLUSION

Libraries are going to grow as information engineering and the whole world is passing through IT revolution. And due to that knowledge / information the world is divided into two parts i.e. knowledge rich society and poor knowledge society. If LIS Professionals do not join the race, they will not provide sufficient information to the users at the right time in right amount. So LIS Professionals are compelled to update their knowledge & IT skills in advanced IT environment. Apart from that Information and communication technology has brought enormous changes in libraries as well as in the role of LIS Professionals. It implies the fact that men can only develop after having been acquired an ideal education. And it is the result of IT that the role of Librarians was totally changed. Now they are called as Information Professionals.

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Changing Role of Library and Information Professionals in Digital Era

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ABSTRACT

The basic role Librarians has always been to acquire, store and provide information to the users but in the present Internet era the librarians have to work as information specialists and meet the changing needs of the digital users and this may demand them to adopt new techniques, processes and services in their library system. This article intends to provide brief overview of changing role of librarian in digital era.

INTRODUCTION

In ancient days, the libraries were considered as storehouse of books whereas the librarians were considered merely as the custodian of these documents. With the passage of time, advancements in information technology have altered the way in which information is handled, stored and exchanged across the world. The creation of Bibliographic databases, the digital catalogues to complement the trusty kardex, and the use of barcode to store the books are just a few valuables innovations. With the emergence of World Wide Web the search for information has gone beyond printed and non-print sources. Now various online sources, database sources and search engines and other Internet sources are available. This has brought a revolutionary change in the way libraries adapt and function, shifting from print to electronic dissemination centre. All these desired the library professionals to switch over from traditional library system to digital library concept.

DIGITAL LIBRARY

Digital library deals not only with digitization of physical resource but also storage, organization and easy access of electronic collection whenever needed. Digital libraries have been defined in a variety of ways. For instance, the Digital Library Federation (2002) defines them as: "Organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily available for use by a defined community or set of communities".

This definition involves three key components, which constitute the theoretical framework underlying digital libraries, namely:

(1) people ;(user and information professionals)

(2) information resources; and

(3) technology.

Digital library involves series of activities that brings together collections, services and people

OBJECTIVES

1. To eliminate barriers of space and time in the search for knowledge
2. To preserve the irreplaceable contents of the collections, and making the historical and cultural artifacts of our civilization available for future generations.
3. To provide faster access to the collection of libraries world wide through automated catalogues
4. To provide access to information to multiple users at a time and save their time
5. To provide better information services to the patrons
6. To reduce cost involved in various library activities
7. To serve the user located in various part of the world through network

COMPONENTS OF DIGITAL LIBRARY

1. Adequate number of PCs connected to high speed local networks
2. Servers and Storage devices like CD-ROM
3. Library automation Software
4. Well trained manpower

5. Scanners (to scan resources available in physical form)
6. Search engines to provide access to information
7. Information resources

Information resources in digital library include

1. Journals, books, CD-Rom, database, sound recording Manuscripts etc. print Journals, books and other rare documents in print format can be preserved in a digitized format
2. External resources include online journals, online databases, online books, etc. Different publishers like IEEE, OUP, Springer link, Emerald, and Blackwell Publishing and different aggregators like EBSCO, Proquest etc. provide external resources. They provide full text access to their resources through
   - Username and password
   - IP address based

CHALLENGES IN DEVELOPING DIGITAL LIBRARY

Developing digital library is not an easy task. Information in digital format can be copied easily and can be accessed remotely by multiple users simultaneously. Some of the challenges faced by librarians are

- The textual information has to be digitized using digital scanners. Digitization of the information in to electronic format is time consuming and requires lot of expertise and knowledge in IT
- Storage media, file formats operating systems etc which ensures access to digital material become obsolete very soon,
- Libraries do not own copyright of the materials they hold. As digital materials can e accessed by multiple users and can be copied easily, librarians have to develop a mechanism that allows them to provide access to information without violating copyright.

ROLE OF INFORMATION PROFESSIONAL IN DIGITAL ERA

Change is the law of nature and, in the present library culture; libraries are not exempted from change. The paradigm of librarianship is clearly changing and the librarian's role is diversifying. Adoption of online education and new teaching methods in most of the institutes has increased the use of library materials including print and non-print. Users often visit library in order to find resources that support their projects and 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 hi/her time. This is possible only when the information professional acquires locates and disseminates the information. It might include interlibrary loan or database searching and sending the relevant information based on user query to the user's desktop through email or through the shared folder in the network

- Collection development

Information professional at present are more concerned with collection management than collection development. They are required to become knowledge managers rather than collection managers. Rising cost and budget cuts have made collection managers to rely more on online systems and electronic databases. Due to technological developments it is difficult to determine which format to buy and which tool is most cost effective. The information professional as collection manager has to understand the features and merits of the each format and take wise decision.

- Preservation and access

Librarian's role doesn't end with selection of right electronic resource in right format. Librarians play a dynamic role in organizing digital information. Information professional has to catalogue, classify and provide easy access and retrieval of the digital information.
Librarian has to have technical knowledge in order to handle the tasks of;

- Massive digitization, archiving, publishing, digital storage and digital preservation
- To maintain internet and control user access to information etc
- Knowledge of the product

Users in the digital libraries expect quick and efficient information service from the librarians. Librarians have to be well versed with the products or information sources they offer to the users, the information processional at the service counter must be able to guide the users in which database or online resources he will find the data. The information professional have act as a doctor treating the user with information.

- Marketing the resource

Librarians are expected to justify the usability of the library resources and services with statistics showing the level of user satisfaction. Although information professionals have strengthened the collection with unique, high- quality digital resources, it is hard to get user attention towards library resources and services without extensive marketing of

the information products. Librarians have to market the information products in order to let the user community to know what products and services they offer to them.

CONCLUSION

The digital era has brought remarkable change in the way information is stored and accessed. This has brought change in the concept of Librarian and the role of librarian has changed in the digital era. With the development of information technology it is important on the part of librarian to acquire IT skills in order to empower library and provide services expected from the users in the new environment.

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Changing Role of Library and Information Professionals

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ABSTRACT

This paper highlights the changing role of library and information professionals in modern information era and ICT Environment. LIS Professionals can provide various services to their users with the help of ICT tools. In modern scenario users are specific in their need. LIS Professionals have to perform various roles to fulfill the user's need effectively. I tried to cover some of them. It will be useful for professionals to not only for their internal users but also the external users also to fulfill their information needs, marketing, Information literacy as well as to provide Information services.

INTRODUCTION

Information Technology is rapidly changing the whole world and creating new challenges and opportunities. Library and Information Science (LIS) profession is one of the most challenging professions. Change is inevitable for the survival and success of any library in the changing technological world. Continuing Professional Development is an essential part of the modern library and information professional's successful career planning & prospects.

CHANGING LIBRARIES

The user expectations to the libraries to deliver high quality, comprehensive, user-friendly new generation services. As the world advances, the library must also evolve and redesign their activities in order to deliver highly quality, need based, and value added services according to the expectations of today's library users. The concept of library has been described by several different terms such as automated library, computerized library, electronic library, digital library, virtual library, library without walls and internet library.

NEW CHALLENGES FOR LIBRARY AND INFORMATION SCIENCE PROFESSIONALS

In a fast changing, expanding diverse global digital information environment, libraries are facing a variety of complex challenges from

multiple sectors of the knowledge society in the 21st Century. The major challenges are:

- Information Explosion
- Information and Communication Technology (ICT)
- Growth and usage of web resources
- Use of digital resources
- User's expectations
- Virtual learning environment
- Virtual educational Institutions
- Development of digital, Virtual and Hybrid Libraries
- Online Bookshops & information Services

These challenges have called for reorientation, reengineering, transformation and great changes in the information environment, library functions and the roles of library and information service professionals.

THE FUNCTIONS OF MODERN LIBRARY INCLUDE

- Application of new technologies in libraries
- Computerization and networking of all library operations, resources and services
- Build both print and electronic information resources
- Providing a access to the content of local and global resources and services
- Provide guidance and training in the usage of digital resources
- Provide responsive products and services to meet the user needs and expectations.

CHANGING ROLE OF LIBRARY & INFORMATION SCIENCE PROFESSIONALS

In the Modern world, library professionals are increasingly responsible not only to provide traditional library information services but also to deliver online information services according to the actual user needs. As the role of LIS professionals is changing to face the new challenges, they must be keen to stay at the forefront of innovation in the library world. LIS professionals need to be confident and competent that they can prepare for new challenges, deal with emerging technologies, manage change effectively and claim new professional roles. A librarian must be a professional expert, techno literate, web usability expert, knowledge manager, navigator, trainer, educator, marketer, service provider and

many more. Librarians have to play many roles to fulfill their user's need.

As a Search Intermediary:
Traditionally a human intermediary is a librarian or an information specialist. Librarians are more efficient and more effective than end-users are at performing their own information searching activities. Librarians will continue to play a role in the newly emerging digital information world. In an organization, though librarians began training to end-users to perform their own searches, the demand for searches by information Professionals have not decreased. There will always be a role for the search intermediary.

As a Facilitator:
The availability of electronic documents on Internet and the support extended by World Wide Web to access these documents have recently increased tremendously. Several print journals have shifted their platform to Web, which includes free and paid publications. In this scenario, the traditional librarian has play to the role of facilitator in identification, gathering and arranging information infrastructure such as network access, software access, licenses and passwords to use charged resources.

As End-User Trainer Educator:
The number and variety of information sources available, whether locally or remotely via the WWW have increased greatly, and users in many cases have not been able to keep up with all of the choices open to them. In these areas, training is given by the librarian would include not only the use of electronic primary journals from many different publishers, but also the use of abstracts and indexing databases, databanks, CD-ROM publications and document delivery services. End-user-training aspect of librarian would also include organization of information resources, search strategies, tools, information searching skills, awareness of resource constraints and alerts to users on new resources in their subject area. Therefore the Librarian has a critical role in the digital library of future as educator or end user trainer.

AS WEB SITE BUILDER OR PUBLISHER
Web site of an organization provides access to external resources, Organization manages their own information on the Web site includes details of course information, directories, statutes, annual reports, etc., The role of the librarian is create a web page to deliver information about the library and its services like hours of service, location of services, details of library staff, library policies, an interface to the library OPAC, CAS, SDI, DDS, etc.

AS INTERFACE DESIGNER

Interface design is going to become important to people to access and use digital technologies. A beneficial way for librarians to collaborate in the work of computer and information scientists in tasks such as design, an organization, development, and maintenance of digital library repositories, interfaces, search engines, networks and web documents. Librarian can help in the design of technology—based information services and share their knowledge and experience in helping patrons to utilize electronic media and using Internet and World Wide Web.

AS KNOWLEDGE MANAGER/ PROFESSIONAL

Knowledge Management (KM) involves the identification and analysis of available and required knowledge, and the planning and control of actions to develop knowledge assets to fulfill organizational objectives. Librarian as a part of KM system can effectively participate in the process of knowledge creation. The creation of the knowledge center in an organization normally involves contributions from three groups of experts such as users, knowledge professionals and technology experts. As a knowledge professional, they include librarians, managers, archivists, and others. Librarians to become Knowledge Managers or Professionals should possess variety of talents and perform the work with high level of skill and expertise.

AS SIFTER OF INFORMATION RESOURCES

The term "sifter" is used for the skilled librarian who helps users make sense and order of the resources. The future belongs neither to the conduit or content players but to those who control the filtering, searching, and sense-making tools to navigate through the expanses of cyberspace. In another words, the librarian can be a key player in the emerging scenario.

CONCLUSION

Libraries have to redesign their positions to meet evolving needs. Librarians need to implement new practices and new technologies, and improve performance and competencies to face future challenges of knowledge society. LIS professionals need vision for modern professional skills and technological competencies in order to have bright future. LIS professionals must strive, struggle and improve new skills and knowledge about new technologies that will be needed to provide responsive Library Information Services to the users.

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Changing Role of Library and Information Professionals in Contemporary Era

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ABSTRACT

The paper includes how professional role and responsibilities have been and are being affected by technological change and what competencies are important in filling those roles. In addition, approaches to training and education to develop competencies are explored.

INTRODUCTION

Librarianship is one of the oldest and respected of information professions, is experiencing great difficulties as a profession at a time one should be experiencing its own greatest growth. The reasons for this happening are varied: environment and new technologies are changing the pattern of distribution of workforce and the ways in which information is being communicated. At the heart of the librarian's professional role is the information mediation between inquirers and suppliers of information. The information mediation process consists of the following steps: an in depth analysis of the question, searching for, selecting, and transferring information. The collection and presentation of what is available is vital for efficient and effective information mediation. The term 'information' here includes all recorded cultural expressions, in word, image and sound.

INFORMATION MEDIATION

The librarian mediates between the demand and supply of information. The starting point is the information need of the user. The librarian contributes to a goal-orientated input into what the library can provide in order to efficiently meet the needs of the library user. This means that he contributes to a continuous evaluation of services. The librarian is not passive, but acts proactively, teaching users how to use information and stimulating information use. This is especially important in cases where

the user has no clear expectation of the service to be delivered and is not able to adequately formulate his question.

But there are many who feel that librarians as intermediaries cease will cease to exist. But these changes will increase the importance of librarians, adding new roles to the existing ones. The changing environment and new technologies are not being fully met by educational institutions. The reasons for these demands and needs are not met are lack of communication between employers of information professionals and the institutions that educate and train them.

The survey of information professional research says that this lack of communication occurs because needed competencies are not well-described and library and information science schools and other training organizations are not communicating well with those who employ information professionals. In order to address this problem the following questions need to be answered:

1. What are the current trends affecting the library and information environment? To what extent will the environment change in the future?
2. What do information professionals do? What functions and activities do they perform? Where do they work?
3. What aspects of the functions and activities performed by information professionals will change the given the trends described in the above question?
4. What competencies are needed by information professionals to perform their functions and activities? What new competencies will be needed? Which competencies will become more prominent?
5. To what extent do information professionals currently possess the necessary competencies identified above in question 4?
6. How can future competencies need to be met?

The project taken by King Research in its framework describes trends which affect library and information science organizations, the work settings in which library and information science professionals perform, and the functions and activities performed. Also considered the types of users served, the tools and techniques used/applied, and types of materials handled. Each of these dimensions serves to distinguish various set of competencies.

COLLECTION AND PRESENTATION

The librarian builds up a collection and preserves it, according to the information and media needs of users, and the role of the library within the communities. In addition to the library's own collection, the librarian consults and makes use of collections of other information supplying institutions and libraries. The librarian takes care to provide a guide of what his collection has to offer to its users. He presents the collection in a way that matches how users ask for and seek information. Today, the collection in the library may be in the form CD ROMs, electronic, digital, online, virtual resources and services etc. The librarian should know where to keep this collection, how to organize them to facilitate in using them.

EDUCATION, KNOWLEDGE AND SKILLS

Librarians in all the libraries have received an education specific to their profession and keep their professional knowledge and other relevant knowledge up to date. He should be competent enough in performing the basic functions of library in today's environment.

PROFESSIONAL COMPETENCE

Competencies are defined as comprising one or more of the following components: knowledge, skills, attributes and attitudes.

Knowledge- of librarianship and information science

Of specific subject areas (eg. Chemistry, law etc)

Skills-Cognitive

Analytical

Technical

Interpersonal

Basic literacy/ numeracy

Attitudes

Towards the profession

Motivational

In library and information science profession, the following competencies are required to make effective use of new information technologies.

to communicate with others,

to analyze needs,

to retrieve data,

to instruct users,

to manage operations and supervise staff who provide services- are same whether or automated resources are used.

The librarian has required having specific knowledge and skills in the following areas:

- Information production and information sources (in printed, audio-visual and digitized forms);
- Information needs and information-seeking behaviour;
- Presentation, including making information accessible;
- Analysis of queries;
- Retrieval techniques;
- Organizational and administrative processes;
- Communication with users and professional colleagues.

Other relevant knowledge and skills

The librarian is able to formulate policy goals with respect to information mediation, acquisition, and presentation and to present these goals in a creative way with activities that promote reading and the use of information. The librarian possesses a broad social interest and pays attention to regional and local concerns. He follows new developments, through professional literature, study meetings, courses and other information sources.

Responsibilities of the Librarian and Conditions for Professional Work

Range of work settings

Now a day, the range of work settings of library and information science professionals includes:

-libraries;
-information centers and clearing houses;
-database producers;
-database distributors and services;
-special collections (museums) and archives;
-information analysis centres;
-Information service companies (e.g. brokers, jobbers, companies);
-project support groups; or
-Record systems or centers.

Broad functions performed by library and information professionals have been defined across work settings. They are grouped under general headings:

User oriented;
Technical; and
Support

USER ORIENTED FUNCTIONS:

User oriented functions involve direct interactions with users or activities performed in direct response to user requests. These are:

Needs Analysis
Searching
Retrieval
Analysis of information
Dissemination
User Training
Program presentation

FUNCTIONS

The library functions involve the collection management aspects of library or an information service which affect end-users only indirectly. These are:

Creation and recording
Production
Collection development
Description and organization
Storage and maintenance
Disposal/weeding
Record keeping

Core Competencies Required in Providing Various Functions of the Library

Competencies fall into two main groupings:

1. General, technical and bibliographic competencies;
2. Managerial, supervisory, organizational and communication competencies

General, Technical and Bibliographic Competencies

When considering educational qualification as a competency a Master's degree in Library and Information Science is still considered a necessity. Traditional competencies like holding foreign languages are also required because foreign languages also believed to be important as the information work continues to become more international. The librarians should possess:

- The ability to understand the technology;
- Interest in the technology;
- Ability to understand and change workflow;

- Ability to find out what one need to know about the technology;
- Knowledge of whom to trust and believe;
- Ability to work effectively with systems people and vendors; and
- Vision to see beyond the department and the library.

Commitment to the service for the library user-the very reason for the existence of the technical services.

BIBLIOGRAPHIC COMPETENCIES

Bibliographic competencies are the very skills of librarianship itself-they are necessary to acquire, organize and preserve library materials-and technology changes them. These competencies are considered under different categories:

The Materials Acquired and Sources for Acquiring them:

Librarians have always needed to know what materials should be acquired and the sources for acquiring them. But the technology is affecting both the materials and the sources.

Major electronic, computer and other media companies now control many publishing firms resulting in a change in the quality of materials as well as in the relationships with old, long established businesses. Dealing with new houses and selecting from their publications requires new skills. Acquisition personnel will need to develop new competencies in locating information about publications. A large proportion of journal literature is available online. New competencies will be required to obtain, organize and maintain materials through these dissemination methods. The introduction of computers into educational settings required the competencies to select software. To learn about the selection of software packages, the acquisition librarian may be found reading from selection materials outside his usual realm. In addition to knowing about software, acquisition personnel must become knowledgeable about the documentation that accompanies the software taking into account what seems suitable to the needs and expertise of intended users. Following that the librarian will need to knowledgeable about the hardware to be sure that the software is compatible with the equipment to operate it. The acquisition librarian should also be aware that any program can have 'bug' in it and should be prepared to deal with the return of the package.

THE TOOLS THAT ARE USED

The tools used in technical services operations that come from outside the library have for some time been affected by the new technologies. This is especially so as the databases have come to include cataloguing-

in-publication data. Using these databases for any technical services function requires competency in appropriate search strategies for each situations for each situation to save valuable time spent on system.

The tools that are made: the role of bibliographic and technical standards:

Every librarian in a local system finds it necessary to interpret not only in local records but also those found in MARC formats of the online bibliographic service. A large supply of bibliographic data emanates from Library of Congress (LC), that library serves as a model for cataloguing standards; LC's policies have a strong influence on those of other libraries as well as the bibliographic utilities.

The new technologies call for variety of technical standards and these too must become part of the knowledge base for the technical service librarian.

The materials preserved: Conservation/Preservation competencies:

Record keeping for the activities of preserving library materials has, for a long time, been more than a local activity. Knowledge of developments in both computer applications and preservation filing is a necessity in preservation work today. The Library of Congress used laser disc technology for information and preservation management. Now a days, the librarian is required to store the digitized objects in video discs, CD-ROMs in different file formats through scanning rare and heritage documents. Competencies are required in knowing new technology in this field.

Managerial, Supervisory and Communicative Competencies:

Librarians have to function as manager, supervisor and communicator. They have always assumed these roles, but certain aspects of roles are of greater importance because of introduction of new technologies. Of prime importance is identification of problem and working towards the solution of the problems. Some problems can easily be identified and even solved. Solving a problem consists of several important steps that likely to take considerable time, effort and expertise when the new technologies are involved. The larger problems cannot be solved in isolation. The steps in problem solving includes: defining the problem, spelling out purpose, setting its scope and determining the budget available. This may need expert advice outside the library staff by bringing in a system analyst.

Financial Management

Financial management also takes on new dimensions with application of new technology. Planning, budgeting and recruiting must be done for adequately trained staff to do each task.

Organisational management

The librarian may not be satisfied with old methods of organization. The traditional lines of work patterns no longer function when the new technologies arrive. The acquisition, cataloguing, circulation and other functions can be integrated when you purchase new library software to facilitate this. But competencies are required when acquiring a software because there are different software are available in the market.

People

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, paraprofessionals the clerical workers who have to decide how best to use automation in their operation.

It becomes obvious that sympathy, compassion, motivation, understanding, a sense of good timing, and leadership become and important part of the competency pack. The communication capabilities reach out to different group of people in dealing with new technologies. In addition to close staff relationships within the library, one will be working with persons outside the library: engineers, electricians, telephone and other communication personnel, computer programmers, system analysts, consultants, vendors, network service personnel as well. Administrators and top management must know about the librarian's needs and plans.

Support functions

Support functions include those additional functions which are necessary to perform user-oriented and technical functions but which may have little direct effect on end-users. They are:

Administration
- Management
- Planning
- Accounting and finance
- Policies and procedures
- Personnel and staff development
- Facilities management
- Communications

Marketing
- System analysis and design
- Research and development

Responsibilities

The librarian has the freedom to act in his professional work according to own judgment. He is aware of his responsibilities with regard to library users, colleagues, the organization, the profession and society. In the execution of his tasks, the librarian acts in a professionally accountable way. Negligence and carelessness in his tasks is contrary to his duties, in terms of both the library users and the organization in which he works. The librarian points out the negative impact on the reputation of the profession, to colleagues who behave negligently or carelessly.

Free flow of information

The librarian respects the right of every individual to free and equal access to information. He promotes the free flow of information between suppliers and users, and between libraries. In this way the librarian contributes to the processes of emancipation of certain groups in society. With regard to the development of services, the librarian takes into account the supply of other information providers and libraries. He strives for cooperation based on the knowledge that each organization has limited means.

Integrity

The librarian executes his tasks according to the principles of openness, public accountability and impartiality. In giving information, he uses clear criteria to select information and information sources. The librarian chooses suppliers exclusively on the basis of the quality of goods and services. The librarian strongly denounces censorship in all measures.

Privacy

The librarian safeguards, within current law, the privacy of users at all times. In relation to the protection of the private domain, the librarian acts according to the directives given in the 'Act on Person Registration' and the regulations based on it.

Contacts with colleagues

The librarian promotes inter-colleague evaluation as part of both his professional role and the quality assurance policy of public libraries. Inter-colleague evaluation has to be seen as an instrument for quality control and improvement in the profession, demonstrating personal responsibility and commitment. The librarian acknowledges that an open and unprejudiced attitude among colleagues is a prerequisite for the efficient functioning of the organization and the whole professional community.

CONCLUSION

To fulfill the various responsibilities as a librarian in the new technology environment, the librarian need bibliographic and technical skills to assist them in acquiring materials, in making the tools that organize the collections and in providing the means to preserve them. He must be capable of managing, organizing, supervising and communicating. For that purpose he should be curious, inquisitive, imaginative and creative. He should be able to select the appropriate software tools, online databases, and digital library software after analyzing them in terms of budget and user needs. He should know about the various electronic or web resources available in internet and make them accessible to the users.

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Information Professionals in Electronic Environment: New Roles and Challenges

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ABSTRACT

Librarians and information professionals face a challenging future. Their work environment is becoming increasingly complex with constant change in the organizational, technological and information environment. They have to keep up with new technologies and systems, new forms of information, information media and information sources, and new tasks and roles. This paper discusses how the traditional functions of libraries are reshaping in the electronic environment and what sort of skills the information professionals require fitting into the new roles with sound grounding in the technological aspects.

INTRODUCTION

The digital world of the late 2000s is a magnificent period of transformation for all. The world's communications and exchange have changed dramatically, bringing us closer to the notion of global village. Libraries are opening up in a virtual framework, facilitated by an iterative and ongoing analysis of the library's virtual presence on the web. Yamazaki(2006) explains four types of change trends observed which are to be managed and overcome by libraries and library professionals.

(1) Information technology (IT) has made a great advance with popularizing Internet access and its use by people throughout the world.

(2) The volume and the variety of information that are being produced day by day have reached to an alarming extent especially on the Web system.

(3) Striking and unexampled changes have been brought by end-users of information and information systems

(4) The value of information itself has been enhanced in business scenes as well as in daily lives.

In today's environment the world is reshaping and reusing content and knowledge. ICT has changed the whole nature of publication, storage, transmission, delivery and use of information. Computers have given us the capability to create, in just a few years, more information than the whole human race managed to produce during its entire history. Layman and Varian (2003) figures out that our civilization creates five exabytes of unique information every 12 months, enough to fill the Library of Congress in the US 37,000 times over, or the equivalent of about 1.2 trillion books; 92 percent of this information is recorded on magnetic media. Influenced by the surrounding technology, today's library users have developed different information skills and needs than previous generations. They are web-savvy and can no longer been seen just as patrons, but also as customers. As customers they expect and want more personalization and instant access to information, and expect highly intuitive interfaces and convenience. Further with the advent of Web X.0 technologies, user-generated content is dramatically increasing the volume of information every second, which has transformed libraries into creative civic spaces. The potential for revolutionizing libraries has imposed many changes on traditional library approaches, settings, means and methods, solutions.

TRADITIONAL LIBRARY FUNCTIONS IN ELECTRONIC ENVIRONMENT: NEW ROLES & SKILLS

The libraries and information sources of the future are likely to be based entirely in electronic environments. In this environment it is often questioned, will there be a role for library professionals? Where do they stand in this scenario? Where their profession is headed? It is often argued that there is no longer a need for information professionals such as librarians, in their traditional role of assisting in accessing information. Librarians are becoming more important in the information-centric universe and are already fulfilling new roles as content providers, search strategists, digital cataloguers, knowledge managers, information navigators, cybrarians etc. These roles will grow and new opportunities will flourish. Thus there is a need to examine the future role of information professionals in presentation of information, reliable preservation, maintaining authenticity and conservation which demands sound grounding in the technological aspects of their profession to transform them into people who design and create ways to access information. The followings are some of the new roles and skills are listed and discussed briefly.

INFORMATION PRESENTATION

Within the information profession content presentation is viewed as a

foremost and fundamental role. The rising generation of users is growing up and they are used to getting things quickly and expect immediate access to any source of information. Informational professionals need to acquire skills to effectively and efficiently 'bring content to the forefront'. Today information is accessed by various automatic systems such as search robots etc. New methods of information presentation are constantly being developed and computers have given us the capability to create, produce and store information in an electronic environment, therefore content can be designed, presented and made accessible through search engines and other sophisticated text analyses techniques. The concepts such as information architecture and usability studies are becoming increasingly important. The field of Human Computer Interaction (HCI) is also growing in significance, since even quite simple changes of font or colour can drastically affect the interaction of the users within online material (Yake & Reynolds, 2006).

The traditional task of locating and finding the correct information is made easy by the introduction of metadata. Conventional metadata forms such as the library catalogue has been transformed into a variety of electronic metadata types such as contextual metadata, structural metadata and content metadata. Content metadata is placed so that it can be collected by search engines that visit and index online resources (Ataman, 2009). Dublin Core Metadata Initiative developed by librarian community and the Encoded Archival Description (EAD) developed by the archives community are the principal metadata standards today and the distribution and sharing of metadata has been possible with the development of Z39.50 protocol and Open Archives Initiative, Protocol for Metadata Harvesting (OAI-PMH) which is currently gaining acceptance as a shared protocol. Currently more sophisticated structures which include identifiers, in the form of complex object format such as MPEG-21 DIDL (Digital Item Description Language); METS (Metadata Encoding & Transmission Standard); SCORM (Shareable Content Object Reference Model) are able to verify the actual source of the digital record.

These tools along with other tools under development are the main pathways used by the new generation. It is this area where information professionals will need to be able to study, research and prepare content metadata for online sources. As the volume of information is too huge in the electronic environment it is not practical to create metadata for each item, but the descriptions can now be made at the piece level, in contrast to the traditional area where they were made at the series level.

RELIABLE STORAGE AND SECURITY OF INFORMATION

The reliability of stored information depends on how well its authenticity is preserved. In the traditional library settings, physical documents were

under librarian's control, but in the electronic archives and libraries it is the functions, processes and uses that need to be controlled, where roles for information professionals would involve monitoring the life cycle of electronic document. Archives and libraries offer the only trusted third-party storage for authentic information, but are they equipped with the security measures necessary for them to maintain this role? (Ataman, 2009). Thus the question of reliability and security of information is a fundamental problem for the information professionals of the future.

In an electronic environment it is easy to create documents within organizations. In such situation the electronic resources need to be controlled with the adoption of functional approach, process control and control of uses. Today we have on-demand publishing of electronic publications that are distributed electronically and it is technically easy to insert last-minute additions and deletions. In order to guarantee that the publication has not been amended and changed during its journey through the life cycle chain on the way to e-library, it will be necessary to ensure that contextual metadata entries relating to this chain are added automatically. For libraries keeping track of such additions will be a nightmare unless documents are automatically equipped with contextual metadata. But this is not going to be easy as systems which can automatically enter and add contextual metadata have been fully developed. A change to an electronic record cannot be spotted simply by looking at the document, therefore methods need to be developed that will control and track usage of e-records along with a reliable security systems. Document Management System (DMS) software has been designed to enable and monitor changes made at various times by various people to the same e-document.

A wide variety of techniques have been developed over the years for identifying the authenticity of documents, but it is not advisable to leave the storage and security of electronic records and information in the hands of a single software application, therefore information professionals will have to start taking a closer interest in on the issue of control and monitoring mechanism so that they can control and track usage of e-records to ensure that no undocumented change is made to the documents. Information security is increasingly becoming a field of expertise which needs greater involvement of library professionals.

AUTHENTICITY OF INFORMATION

The concept of authenticity has played a central role in the creation and management of records in archives and libraries. Guaranteeing the authenticity of records is required at every stage. That is, since the authenticity of a document verifies that the document is the same as that which a user expected based on a prior reference and ensures that they are unaltered from the time of creation, access, maintenance, and

preservation is required over many stages of records life cycles (Park, 2004). Calligraphy, watermark, diplomatic and physical structure and assessing its internal consistency and its resemblances with documents of the same period, are a few judgment criteria about the authenticity of the historical documents in the conventional libraries and archives. It may be necessary to carry out these similar sorts of examinations in respect of electronic records and publication. Ataman (2009) points out the following four documentary elements for establishing authenticity of manuscripts.

- ***Calligraphy:*** The equivalent of calligraphic characteristics for an electronic record would be the character encoding and details of embedded fonts. These would give us some information about the earliest possible date on which the document or publication could have been created.
- ***Physical form:*** Maintaining authenticity of records and manuscripts on traditional media involved studying its physical form. The equivalent in an electronic environment would be studying what comprises the formal attributes of the record as well as the technological context that determine its external make-up including script, language, special signs, configuration used, operating system architecture, application software, file formats etc.
- ***Watermark:*** Establishing authenticity of original media often involved looking at watermarks. Now there is interest in applying the digital equivalent of a watermark on electronic media. For example, Data Glyph technology has been developed by Xerox to embed data on paper or in images in a manner that is undetectable by the human eye but readable with special tools and provides hope to develop similar techniques for electronic records.
- ***Diplomatic:*** It is a fundamental area of archive studies dealing with the construction, style, form and materials involved in the making of documents, their presentation and internal structure and the relation of all these characteristics to their content and context. The diplomatic characteristics of documents provide fundamental clues to establish authenticity. For the coming generation of information professionals diplomatic can be deployed in establishing the authenticity of electronic records, but this will entail an updating of the field of diplomatic and the initiation of close study of the diplomatic characteristics of electronic records. Library professionals need to emphasize the concept of authenticity in the management of electronic

documents and assess the concept to the use of electronic records in the life cycle model by means of such documentary elements.

CONSERVATION OF INFORMATION

One of the tasks of the archives and libraries is to ensure that the digital information heritage is passed on to coming generations and used by them. But in the electronic environment documents, unlike the fixed texts of print data, are subject to inadvertent destruction of both the physical medium on which they exist and the intellectual content of their information. There are many ways to destroy electronic data inadvertently. First, the medium is at risk. Then there is the bigger problem of intellectual preservation. Many types of accidental changes may occur; a document can be damaged as a result of the nature of electronic resource (for example, a dynamic database, by its nature is frequently updated, erasing previous data in the updating etc.). Unauthorized tampering, lack of metadata and system documentation, electronic data in forms that cannot be presented, software or hardware becomes obsolete etc. There are various methods emerging today in the field of electronic data preservation and conservation such as Migration, Bitstream Copying, Emulation, Encapsulation etc. Informational professionals will have to transform their everyday duty to preserve materials from various forms of damage. They need to monitor current and future file formats, and the structural metadata associated with them.

CONCLUSION

Librarianship profession is one of the newest and oldest professions in the world and the times call for a new breed of librarians, those who understand and integrate technology, information and learning into a new model (Rao & Babu, 2001). However, to sustain in the field of electronic librarianship, information professionals cannot simply use their tried and trusted methods. They need to employ more engaging and active methods to reach their patrons. They need to be armed not only with the traditional library and archive skills, but also with this new class of technological skills, programming languages, knowledge of hardware and troubleshooting, understanding of software programs, and the skill to search, display, and retrieve data effectively in a variety of information retrieval systems, content management and presentation, reliable storage & preservation, maintaining authenticity and so on. Making information professionals competent locally and globally necessitates greater investment in staff for raising their level of technology skills and preventing skills obsolescence, therefore Institutions training such professionals will have to ensure that they are producing future information professionals by adding technical elements to the curricula otherwise IT people will take command of the technological aspects of our work.

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Librarians Status and Role in the Changed World Order: An Overview

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ABSTRACT

This paper tries to investigate the role and status of librarians from the 18th century till date. Tries to find out the working conditions and related designations they acquire vis-à-vis their pursuit in the electronic age. The term "librarian" has become obsolete but essential in this era of Information and communication technology with different flavour of terms like "Knowledge managers" information navigator etc., in 21st century.

INTRODUCTION:

Ancient librarians would have had high status in their societies because they were often scholars or priests and they would have been among the only people able to read. The development of printing led to a higher literacy rate along with the cheaper and more widely available books and sizable libraries became a status symbol among the elites of the Europe, but librarians, although honoured members of society were not professionals. With the formation of ALA in 1876, Library profession grew in leaps and bounds.

With the growth of electronic media, it was supposed that librarianship as a profession will soon be obsolete. But it was seen that persons attending library schools has increased many fold. Library curriculum has also changed with incorporating electronic means and forms of information, similarly, the status of the librarians. This paper tries to review the changes in the status of the librarians from the keepers of the book to the providers of knowledge in the 'Knowledge age.'

GROWTH AND STATUS OF LIS PROFESSIONAL FROM EARLY AGE TO DIGITAL AGE:

Early stage

In 18th century librarians were like a keeper of the books. They have to "protect the books, exercise control over their use." In those days,

college's budget was small and books were very precious treasures entrusted to the care of scholarly respected men, i.e. librarians. Books were kept locked in the Almirahs and only few lucky one could use them. The librarians were supposed to be a book-lover who can safeguard the books as their valuables. The word 'librarian' to the library staff was given at the time of Hapsburgs in 1784. With the growth of electronic media, it was supposed that librarianship as a profession will soon be obsolete. But it was seen that persons attending library schools has increased many fold. With the growth of electronic media, it was supposed that librarianship as a profession will soon be obsolete. But it was seen that persons attending library schools has increased many fold. Library curriculum has also changed with incorporating electronic means and forms of information, similarly, the status of the librarians. Before the late 19th century, librarianship had yet to be considered a service profession. M. Dewey argued that the librarians have to work beyond keeping and preserving the books. In his words, it is not enough that he can, when asked give advice as to the best books in his collection on any given subject." He must put every facility in the way of the readers so that they may move from good to better. He must teach them how, after studying their own wants, they may themselves select their reading wisely." This was the milestone in the recognition of librarianship as a profession in the time of M. Dewey. According to him, Librarians are professional people, and they should be given proper place and status in the library world. Librarians are professional people, who are highly skilled in putting the knowledge of their field into practice. In 1876, Samuel Green's effort led to the development of open access mode of library operations and his colleagues were able to introduce new educational techniques in their libraries and libraries became the laboratory of the teaching faculty.

20th Century

By 1900, Colleges and universities' librarians started to support students in their studies and research. Librarians were invited as guest lecturers on bibliographic instructions. In USA struggle for status started in 1902 at university of Montana, and result was, the librarians got their due status. Mid 19th century was the era of Dr. Ranganathan, who predicted that librarians should offer services based on other sources rather than printed materials. In 1931 library staff were categorised either as administrator, line workers or staff, but only administrators were having the power. It witnessed the "Information Explosion," a term coined by Ortega Y Gasset in 1934 and also the role of librarians as a filter between piles of documents containing information and the user. Rothestien's "History of Reference Services" was published in 1953 which provided a meaning to library profession and also argued that different types of libraries are interrelated. Librarian's role is getting specialized. The faculty was no

more involved in the selection of library materials. The academic librarians have to perform a role of the shapers of the contents and services of the libraries rather than mere an advisors. [1]

By the 1960's, with the development of IT and network based services led a sea change in the role of librarians as well as their status. With the evolution of complexity of library as a functional organization the function of librarians was reoriented and it became unit based. The two dimensional organization charts changed into three dimensions in 1973. With this they became status conscious, they started seeking some form of recognition in the teaching learning environment of the library, like faculty members. To equate themselves with the teaching faculty, they started taking keen interest in revising their own credentials. This led in changed thinking and action including, earning advanced second degrees becoming comfortable with scholarly publishing and doing more of it, aggressively promoting the profession to academia, building flexibility into the work schedule and self confidence in the mission of academic libraries and librarianship. In this mission "librarians really never got faculty status but become library faculty, akin to a kind of second class faculty member. His preference should be a first class librarian rather than second class faculty." [2] Librarians were always in demand of the status, that too faculty status. Really speaking they never got faculty status but become library faculty, akin to a kind of second class faculty member. His preference must be a first class librarian rather than second class faculty. [3]

In the late 20th century Information Professionals were the new term used for the librarians, since they interact with the information environment, particularly which is represented through the internet, is complex multidimensional and dynamic. This also witnessed the emergence of electronic libraries, which acted as central resources, reaching out across every cross section of the institutions. In 20th century, society was in an industrial age, where people needed "What-kinds" of information, while 21st century is the post-industrial or knowledge age. People need something more besides "know-what" i.e. "know-how" knowledge. They have to develop personalised learning programmes-co-constructing programmes of learning for students. They have to build a general competency which can be interesting for them as well, and "add value" to the information they provide. Now people have very little time and they want to know more in a more precise way. There is always a gap between know-what and know-how type of knowledge. This requires a different mind set to bridge that time gap as this always has a small half-life. Librarians are supposed to think differently and act. According to Klobas in the electronic service context librarians' role will become more prominent as educators, information management consultants, custodians

of information, information providers and publishers, change agents and custodians of public library facilities. [4]

Modern Age

In the modern era, with the advent of microfiche, microfilm, LC Copy, MARC, CIP, Computerized catalogues, dedicated terminals, PCs CD-ROM, free internet has influenced the working conditions of librarians a lot. Now they are technocrat, but the ultimate task of providing the "essential" from the "existing" remains a constant variable in the arsenal of the forward looking information institutions and individuals. The very nature of libraries has also changed from private to the public institution. Modern libraries with its network accessible collections seem to be moving back to the private space of an individual or of a small group. But here again librarians as information processors has a sense making in adding a value to the information and available to the clients. Sense-making is the process of seeking and using information that involves both cognitive activity (mental processes of perception or reasoning) and behavioural activity (acting on the information).

Doyens of the library science viewed the 21st century to be the knowledge age. In which teaching learning paradigm will take a different shift. The energy oriented 20th century will give the way to the knowledge and information oriented 21st century, based on high performance. The already existing data or information management system has shifted into the knowledge management system or rather knowledge discovery database or knowledge work or knowledge organization etc. Traditional libraries have shifted into that of a highly interactive, proactive, digitally based, cyber mix of staff activities and services inhabiting what we formerly called library. However the 'INFOplace' and 'INFOspace' are increasingly common terms and cybrarians, the acronym for professional librarians, who operate in the cyberspace, is beginning to make its way. This requires in part of the librarians to continue teaching and learning as a continuous process only then they can survive in this environment and will be enable to fullest use of new technology. [5] Any electronic information provision may bring new responsibilities to the traditional library role. Librarians are supposed to create new alliances and new relationship within the library institution so that they may be prepared for the consequences of the changing work environment.

Young people are very well prepared in the knowledge age. They know how to enhance their learning capacity, not learning their text only but something more. In this learning of something more librarians as information professionals have to play a leading role i.e. developing the ability to do things with knowledge, using existing knowledge to develop new knowledge etc. The librarians and libraries will still be very much

important in the knowledge age. After all the old fashioned definition of the library is store house of the knowledge. They can only provide the required from the store by filtering out the trash. The technologies, technological tools and trends of information management may change, but the ultimate task of providing the essential from the existing remains a constant variable in the fast changing information scenario. In this changing trend of the librarian trade, only the understanding of the strategic relevance of knowledge is required. They have to response to information query beyond what is requested by the enquirer from the big store. It may include the derivation of "problem oriented answers" from vast amount of data through strategies like statistical analysis, machine learning and automated reasoning.

In the knowledge age librarians' are playing the role and will play the role of "Knowledge Engineers, Knowledge Navigators, Knowledge Editors, Knowledge Guides, Knowledge Gatekeepers, Brokers or Knowledge Asset Managers." Librarians who cannot use computer and internet-based technologies will become outdated and slowly and slowly will be discarded by the system. Effective system use is the hallmark of professionals that could provide access to knowledge in the emerging knowledge age. It's being an evolutionary process, this contribution of librarians are vital because at the culmination of the knowledge age librarians will still be there to make a connection between the sources of the knowledge and the seekers in a user friendly system and services. In real sense, librarians are 'Electronic Resource Librarians,' a designation which suits much in the changing world scenario.

CONCLUSION

Librarians have seen a sea change in their role from "keepers" of the books to true "librarians" than to "information professionals" and finally "Knowledge managers." Yet the basic duty of providing the relevant information from the store remains the same. They are still providing the desired information to the users although in the modern way with the use of ICT. They are playing dual role of information providers as well as system managers. They know how to differentiate between the know-how and know-what of the information which is available on the net. They are acting as "formation broker" as well as "Resource managers"

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Role of Information Professionals in the IT Era

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ABSTRACT

The article focused on Informaiton Professionals and their role in modernized library environment, which is fully automated operations of the library activities. It reveals, How best Information Technology can be used for their profession?, What are the strengths and weaknesses of the information professionals in the IT era?, What is the scope of these information professionals is described and concluded with the few recommendations on how the information professionals should be exposed to the modern library services with their existing systems and services.

INTRODUCTION

Information Technology is one of the major factors causing changes in the way people communicate, locate, retrieve and use information. Library and Information Centers have embraced the new information technology more profoundly than many other fields and most of them are currently using electronic products and services. A Librarian has a unique role, requiring the integration of teaching skills and competency in librarianship.

For the strength and success of a profession, professional education plays a vital role. In the fast changing scenario it is important to discuss and delivery on this important subject. Peers in the field of library profession and library education have joined hands together to analyze and examine some of the problems being faced by LIS education.

Changes in technology mean a changing role for today's librarian. Now, on top of traditional library duties, the librarian must also function as both an instructor and a guide. "The networks and the flood of online information and search engines to harness that information are forcing a major change in the approach of librarians to reference and information service." While patrons have increased expectations about where to locate information and what depth that information may have, they probably don't have the skills necessary to find and judge it themselves. Although there can be no doubt as to the dual role of both the teacher (in the sense of educator) and the librarian (as the person in charge of the library). Library instruction can be as basic as how to search the OPAC, or as complicated as searching multiple databases for research information.

DEFINITION's :
Definitions of the digital library provide a more integrated approach. McMillan (1999) stated 'digital libraries and traditional libraries should not be separate, but should co-exist to accomplish more than either can do independently to serve the user community on the highest order'. McMillan (2000) later refined her definition of a digital library to one that 'should be a seamless extension of the library that provides scholars with access to information in any format that has been evaluated, organized, and preserved' and that the digital library 'adds value and saves time while extending the hours of access'.

In order to reach an understanding of the role of librarians in the virtual library environment, it is worthwhile examining the role librarians have filled in the past. In ancient times, there was little if any distinction between an archive and a library. For many centuries book collecting was an opportunity either to display one's wealth, or the results of scholarship. It was not until the nineteenth century that library collections became more universally available and library science began to codify standards for describing and organising resources and librarians began to move beyond merely keeping and preserving books. Melville Dewey wrote in an early edition of the American Library Journal: The role of the librarian grew from that of a collector and preserver of information resources to a professional involved in very complex issues of organisation, the dissemination of and access to information.

The role of the librarian, particularly during the past two decades, has further evolved to encompass the burgeoning technological developments.

The unique function of libraries is to 'acquire, organise, offer for use and preserve publicly available material irrespective of the form in which it is

packaged (print, cassette, CD-ROM, network form) in such a way that, when it is needed, it can be found and put to use'.

Rusbridge (1998) described the role of the librarian in the print environment as the person responsible for selecting, acquiring, organising and providing access to relevant information. These tasks have become more complex as the volume and range of information available has increased (Dugdale, 1999). Not only that, but new tasks and roles have emerged.

Knowledge is becoming multidimensional in the digital age, as such libraries need to reconsolidate their position, redesign their services, incorporate new technologies and upgrade information resources. They should play a proactive role in harnessing the information to satisfy the needs of users.

The libraries and library management are undergoing significant changes today not only in outlook, but also in function, services, methods, and techniques for collection development, processing and dissemination of information. Libraries have to keep pace with technological development emerging in management of library resources.

As research and teaching increasingly rely on global networks for the creation, storage and dissemination of knowledge, the need to educate information-literate students has become more widely recognized. Students often lack the skills necessary to succeed in this rapidly changing environment, and faculty need training and support to make use of new technologies for effective teaching and learning. The current environment provides an opportunity for librarians to play a key role in the evolution of an integrated information literacy curriculum.

These definitions provide an indication of the roles which librarians have assumed during the final half of the twentieth century. They acquire information resources relevant to their user population in whatever format is available and appropriate; they organise the information within the library collection; they provide a means for users to access that information; and they educate users in accessing and interpreting information resources. Librarians are moving beyond the traditional roles of collection maintenance and custodial duties to newer functions of translating, accessing and marketing resources beyond the walls of the physical library collection.

NEED

Most of the current, scholarly and commercial information is now on line. Tremendous growth in the number and variety of online digital

information resources i.e.:- Electronic versions of traditional scholarly publications like journals and increasing number of free, quality content made the librarians to acquire and maintain digital materials in their library. This arises the Librarians to do increasing need for "Personalization" of information packaging and delivery. Significant use and preference for, online resources by students, teachers and researchers. Their expectation for improved access to electronic information continues to grow. Through this we will get instant access to a wide range of multimedia digital information sources of the World. And improved internal communication and access to internal information.

If users have access to the Internet, do they need librarians?

- Not everything is on the Internet, yet. (Why?)
- Need to identify, organize resources for organisation's needs.

Changes in library tasks, policies and practices call for a new knowledge base and skills among the professionals. These including technology handling abilities, managerial skills and a better understanding of copyright and legal issues. In this changed environment professionals needs to look not only within themselves but also to the outside world for their betterment. In the earlier days traditional librarians use to manage printed sources of information and services; now in the changed IT environment, he has to maintain computerized catalogues, library automation, and online search CD-ROM databases because of Digital publishing, internet, and intranet and many more in the automated IT environment.

To achieve digital environment in libraries besides the development of good infrastructure, human resources too require to be developed and upgraded to meet the digital challenges. Training the professionals in fundamentals of IT, database creation, library websites designing, networking etc is to be made mandatory. Since the handling of information in the present era is greatly influenced by IT tools and latest technologies, continuous training of library professionals in latest developments is very much important at this stage.

SKILLS REQUIRED FOR INFORMATION PROFESSIONALS

An ideal information professional should have the following skills:
[Potential roles for librarians in an "Internetted" organisation:]

- Suitable subject knowledge of the parent organization.
- An understanding of the information sources and users.
- Good communication skills

- Intermediary. Take a query and provide a "packaged" answer, drawing on a range of resources: print, online bibliographic databases, Internet.
- Guide. Provide pointers to aid user in search, critical evaluation of relevant resources.
- Facilitator. Arrange information infrastructure: network access, software, licences to use charged resources. Assist in using the databases.
- Educator. Provide training in Internet use: tools, information searching skills, awareness of resource constraints. Alert users to new resources in their subject area. Teaching Students to Think Critically About Internet Resources.
- Web site builder. Introduction to Educational Resources on the WWW

    - Locate, evaluate, and provide links to information resources relevant to organization. Provide a customized view of the Internet.
    - Provide information about library / information service on the Web (site).
    - Manage organization's own information on web site, utilizing information skills to provide a Campus-Wide Information System / Intranet.

While library instruction takes up more and more of a librarian's day, it is by no means the only training role a librarian must take on. Physical access is of course the first step in mastering new technology, but we cannot provide physical access and neglect intellectual access. Librarians must help learners "with the skills to access the resources intellectually so [they] can be evaluators of information, critics of that information, as well as good processors and synthesizers of information". Too often patrons assume that because it is on the Internet it is a authoritative source, thus it is important that the librarian is available to help "users sort through [the] millions of online sites and resources to weed out those that are merely inaccurate."

In a bold move, John N. Berry also suggests that it's time for librarians to step away from their self-imposed role as neutral suppliers of information and to begin "to make the value judgments and to take the risks required to give people the advice about sources and the interpretation of information they need". Berry argues that, "If we don't offer that kind of professional information service, who needs us?".

SCOPE OF THE INFORMATION PROFESSIONALS IN IT ERA

To fulfill the emerging role for librarians, Librarians are required to perform their managerial duties often with time-constraints imposed by their educational commitments. The roles that Lacey identifies include:

- educator
- curriculum advisor
- information professional
- resource manager, advisor and selector
- trainer for students, teachers and school assistants
- team-teacher
- computer technology advisor and troubleshooter
- Internet trainer and supervisor
- network coordinator
- literacy consultant and advisor
- cataloguer
- librarian

Similarly, Librarians are advised to accept new roles and to be more interactive with other staff. In this way, they will become more valued for their information expertise and technological know-how (ALA, 1990).

Clearly, it is not possible to undertake all the above functions and perform each to an ultimate degree of success. There is neither the time nor the resources for this to be accomplished.

The following are strengths and weaknesses inherent in the library science profession. In the changed environment librarians can give following services to the users:

STRENGTHS

1. By the nature of their profession, librarians are service oriented.
2. Ensure relevancy, quality and currency of information resources. Librarians are able to identify, evaluate and organize print as well as electronic information resources.
3. Personalise information access and delivery. Librarians understand what the user wants and are very close to the user information requirements than other professionals.
4. Librarians are able to train users to search and retrieve information, which is a part of user education in his profession.
5. Librarians believe in the value of information sharing and networking.
6. Integrate access to print and digital information sources. Librarians are experienced in knowledge management concepts,

which are most identical to the classification, cataloguing, documentation, storing and making information available on networks.

7. Promote Learning, Sharing, and collaboration.
8. Last, but not least, 'human touch' they can impart.

WEAKNESS

- Librarians lack same level of technical knowledge in dealing with computer hardware, software, etc. as the concerned professionals.
- Librarians are no longer acting as controllers of information especially while using Internet.
- They are struggling with the user's false perception that the Internet can meet all information needs.
- Librarians need to interact with knowledgeable users and IT professionals to understand their specific needs and to add value to their products.

RECOMMENDATIONS

Requirement of Information Professionals in IT era

- Trained library professionals having adequate exposure to IT is a basic necessity.
- Continuing education in IT for the existing staff towards professional development is required to ensure competency in the field.
- Special fund provision is made in the annual budget for IT gadgets, new and latest software's may be added to the existing system. 10% - 25% of technology budget should be spent on staff learning. Education and training courses for library and information professionals need to include IT in their curricula and programmes.
- Library Schools should introduce special short term courses on Information Technology application in Libraries and the working librarians should be given priority for the admission and it should be treated as a Duty Leave. Library professionals should be deputed for continuous education programmes and training from time to time to upgrade their skills in collaboration with the specialized centers like DRTC, NCSI and others where the facility and faculty already exist.

- For librarians, these changes have led to increased communication, improved services and the cooperative leveraging of resources.

CONCLUSION

As the governing body of educational institutions in India the UGC, AICTE, ICMR and other organizations imposes staff formulae that determine the number of Professionals in the libraries i.e:- Librarian, library assistants, supporting staff and budget allocations. But nobody cares about the implementation of this formulae. UGC, NAAC and other governing bodies are very much interested in automation of their libraries, but they don't implement the staff formula and only the librarian (one man show) has to do everything in the library. Some of the institutions are not willing to part their librarians for in-service training, because of only person in the library to manage their library. If this is the condition how can we expect the librarians to exist upto the mark.

In conclusion, in order that Librarians are able to maximize the educational opportunities for members of their community, it is necessary to increase library budgets in order that:

- Institutions have adequate numbers of personnel to allow access to appropriate information.
- Library personnel are appropriately qualified in IT sector.
- The professional attributes of Librarians are acknowledged
- Professional development is on-going, appropriate and substantial.

However, to sustain in the field of librarianship, librarians need to equip with technical skills such as knowledge of HTML, programming languages, knowledge of hardware basics and troubleshooting, understanding of software programs, and the skill to search, display, and retrieve data effectively and efficiently in a variety of information retrieval systems.

Thus, technology is changing the role of librarians, "from the keeper of the books to that of network navigator," and is providing the opportunity for librarians to become more active participants and leaders in the educational process.

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Role of Librarian in the 21st Century

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ABSTRACT

All modern libraries are facing new challenges due to the immense amount of available information in form of electronic tools. The traditional libraries should be transformed into hybrid libraries focused on providing information collected in the form of books and electronic sources to survive and meet the need of end users. With the development of the modern information technology the traditional libraries have not been fit on the requirement of the information time and knowledge economic development, so these face the basic changes and innovation. In this paper authors emphasize the role of librarians in libraries which have collection in form of e-books, digital documents and various databases and common access to the Internet. Modern libraries are creating the society of knowledge and in these modern libraries a librarian works as information officer who is a guide to help search the relevant information in numerous sources of information. The librarians are constantly open to any changes in their field and eager to improve their skills and knowledge. The importance of personality traits of a modern librarian are particularly emphasized.

INTRODUCTION

Society is an open system, dynamic set of interrelated social systems, institutions and individuals that act upon and react to the various aspects of the world around it. The term 'Information Society' describes the characteristics and structure of a society in which the driving force will be the production of information values and not material values. It will be a society that brings about a flourishing state of human intellectual creativity. The society is becoming increasingly centered on information handling, processing, storage and dissemination, using microelectronics-based technologies, made available through the convergence of computer with telecommunications, namely, IT. Information Society appears as an outcome of technological and economic changes. Information Society and Knowledge Based Society

The information age has arrived and modern society is commonly referred to as the "information society." Still, this term does not have a commonly accepted interpretation. The first definition of information society was established as early as in 1963 in Japan by Tadao Umesamo, concerning the "information processing society." The civilization to be built as we approach the 21st century will not be a material civilization symbolized by huge constructions, but will be virtually an invisible civilization. Precisely, it should be called an 'information civilization." Information society is described by the modern researchers as "the society in which the information is intensely used in economic, social, cultural and political life; it is a society with abundant means of communication and of information processing, the society being the basis for serving as a major part of the national income and ensuring the source of income for majority of the population". The information society is defined as "the whole of activity serving to produce, use, protect/secure, accumulate and pass on information. The information society is constituted by all those employed in producing, using and transmitting information as well as those creating information infrastructures."

The popularity of the Internet and other electronic mass media is spreading very fast. The use of internet and e-resources created a new type of society and the analog technology has been abandoned in favour of digital technology within a couple of years. This new society is also referred to as the digital, Web, Internet or computer society. Information is the most sought–after and valuable merchandise in this society. It becomes indispensable for one's social and professional development to keep up with information constantly, to gain and use it in practice, due to changes taking place in the modern world. The crucial factor is being well acquainted with and searching for adequate sources, selecting and evaluating the information from the "ocean" of information as well as having the ability to transform the information into knowledge.

ROLE OF LIBRARIES IN INFORMATION SOCIETY OF THE 21ST CENTURY

Education and professional activities are the major method for fighting against social exclusion. In this context we mean literary and media education at the primary school level, and technological information at higher levels of education. An extremely wide scope for such activities is available in the libraries. The information is provided to the society in need of information through the library cooperation with the development of science, economy, culture and education. Therefore, the libraries were co–creating the information society long before it started to be associated with particular conceptions of society.

Twenty–first century libraries have a lot in difference with the traditional model. Their dominant elements are changed.

S. No.	Traditional Library Collection	Modern Library Collection
1.	Book	E-Books
2.	Journals	E-Journals
3.	Bound Volume	Journal Archival
4.	Reference Collection	Digital Tools
5.	Slides	Images
6.	Scientific Movies	DVDs
7.	Photo Album	Image Collection
8.	Newspaper Clippings	E-Newspaper clipping (PDF, PS, DOC Format)

Most library–related processes are now computerized. Due to the technological development, it is easy to access the required information within time throughout the world. It has changed methods of communication, and consequently it has altered the tasks to be undertaken by modern libraries. To enable users to interact with humanity's cultural heritage as a means of preventing cultural homogenization in the age of globalization, modern libraries should offer a widely–perceived educational activity. With the impact of new technologies cooperation between libraries is possible, with the information resources in today's libraries constituting a significant contribution to the informational potential of a society.

ROLE OF LIBRARIANS IN INFORMATION SOCIETY OF THE 21ST CENTURY

One might think that a librarian is no longer necessary due to the use of electronic sources of information, as well as a world dominated by common Internet access with new libraries and the process of gathering information may be performed automatically in modern libraries. However, this is not true. To search the required information a great amount of time is required due to the increasing rate of the speed and amount of information in the world and also on the Internet. In order to efficiently find, select, check and make information available, and understand the users' needs, through a computer program or database it is not possible to provide some sort of condensed data, an information expert such as a librarian is required to access the information. The tools and resources used to supply required information and transform it into knowledge are changed but the librarian's role has remained unchanged. Especially now, it seems necessary to reflect upon the characteristics of a modern librarian that would best serve all users. Therefore, the librarian is indispensable in the era of the information society.

In Information Society modern libraries could be compared to information malls. Moving around them can cause certain difficulties. A very common phenomenon is that of "library anxiety," mainly observed in higher education institutions where users feel uncomfortable about their level of knowledge. The obstacle is fear of embarrassing oneself when asking elementary questions, or getting a negative feedback from a librarian. Another is a lack of computer proficiency, which renders searching superficial and incomplete and makes one feel uncomfortable ad lightly unconfident in the environment. Therefore, one can obviously conclude that the librarian is an irreplaceable link. In a full self service library, which has a remote information section and a cyber librarian, from which one can obtain necessary information at any time, there is a librarian, who indirectly participates in the process of searching for information. In the era of information processing, communication, and the knowledge industry, the librarian participates in building a new society.

Librarians are important as a professional group and their role is not limited to passing books. Modern library staff works toward winning new readers, similar to commercial organizations winning customers. A modern human has a craving for acquiring knowledge from childhood, and considered in it the role of libraries and librarians. Therefore, the libraries' advertising promotion activities are tied to creating a social conviction that libraries are a necessary link allowing the user to realize even the most advanced information needs. This can take place by evoking in the reader the idea that he is important, approached individually and professionally. In a consumption–oriented world, the role of information has equal importance as that of any other need in a contemporary individual's life.

Readers may or may not be aware of their information needs. The role of a librarian consists in comforting the users and supporting them so that they can overcome their own fears about being in the library. To make a user friendly image of libraries and librarian, it is essential to adopt individual approaches to different types of customers, often including special–needs or elderly users who possibly may be unable to utilize the new technologies. The knowledge of psychology pertaining to customer service is extremely important in the process of the librarians' in–service training.

INFORMATION LITERACY AND LIBRARIANS

Information literacy is "the ability to recognize the need for information and to identify, locate, access, evaluate and effectively use the information to address and help resolve personal, job related or broader

social issues and problems." Professional library associations like the Indian Library Association (ILA), American Library Association (ALA), Australian Library and Information Association (ALIA) etc. are conducting developed information literacy programmes.

The term '*21st century skills*' includes information literacy skills, digital literacy skills, media literacy skills, information and communication skills, critical thinking and problem-solving skills and interpersonal and self-directional skills. To succeed in the 21st century, one should have all these 21st century skills.

WHAT SHOULD THE TWENTY–FIRST CENTURY LIBRARIAN BE LIKE?

Twenty–first century libraries heap new tasks upon a librarian. There is a lot of difference in the model for a hybrid librarian and a stereotypical librarian, except in lending books. Modernized working conditions *i.e.* new library buildings, new technologies undoubtedly, influence the changing image and prestige of a librarian. A modern individual wins against the stereotypical image of a librarian. A contemporary librarian becomes a guide in the world of knowledge, which demands they know how to use the new sources of information skillfully. Modern librarians are crucial now for not only their high level of expertise, but also for being able to associate with the modern individuals' personality. A 21st century librarian must be modern, with acquiring psychological, praxeological, social and professional capabilities.

Psychological abilities involve self–awareness, self–evaluation and self–control. A librarian should always be aware of modernizations, new resources and new technological developments, noticing the need for their own development, not only when encouraged by their superiors, but also resulting from their own motivation to learn. The need for development must stem from the natural predispositions in the librarian because such skills are not provided by the education. A librarian must be aware of his or her role and aware of the need to constantly develop and improve. Praxeological abilities involve diligence, adaptation and motivation. A librarian's diligence is beyond question, as meticulousness is a required characteristic and associated with the librarian's profession by society. In the twenty–first century, gradually necessitated a change in traditional work methods due to the technological developments. Today, continuous professional development is very necessary in the form of courses, training, conferences and meetings, and the use of new educational methods such as e–learning or internet discussion forums.

The twenty–first century society is a learning society; therefore by virtue of their mission, librarians should serve as an example for other professional groups. "Learning processes are not only in favor of other co–employees, they also have an impact on effectiveness and quality of the library information services" and a librarian must be aware of this.
A modern librarian is open to innovations and changes. He/She has an eager and interested attitude towards new solutions because of the fast–paced, constantly evolving nature of changes in libraries. A modern librarian, can develop modern characteristics throughout one's professional career even after many years of work, one does not need to be young to be modern. The shift in the image should be first reflected in us, following the proverb "fine feathers make fine birds," and it involves the ability to evoke intended emotions in others. The librarians' ethic of collaborating on improving their image as well as sharing experiences and mutual support helps society to perceive librarians as a strong, determined group of professionals, aware of their socially useful role. By utilizing social competences such as empathy, persuasion, leadership and cooperation a librarian can provide better service to the society. The librarian's personality instantly creates a link between the media and information for the users. The task of librarians consists in recognizing, satisfying and developing information, educational, scientific, cultural needs and the needs for entertainment. A librarian must be aware of technological developments and be proficient in new technologies. Librarians play a role of psychologists, because they are challenged to distinguish the users' needs appropriately and help the user specify them.

Libraries are regarded as service providers, while the information becomes merchandise and a user the customer. To many people, the library is often thought of as a place only visited out of necessity, in order to find a necessary item or get particular information. The need for constant knowledge acquisition will result in more frequent users' visits, so it appears crucial to make this place a pleasant experience for the user–customer. Modern librarians ought to change themselves with changing image of modern libraries. Working with pleasure, and not with a sense of obligation, enables one to derive satisfaction from it, and only an employee genuinely involved in performing his or her own duties is able to approach each specific customer–user professionally.

Discussing professional qualifications last might not seem to make sense; however the essential issue appears to be the personality of a contemporary librarian, his way of approaching his duties and new challenges, while education becomes only a help in professional life to acquire knowledge. A modern librarian should also be qualified in terms

of sources of information and using them, not to mention keeping up with constantly changing information resources. For a successful librarian proficiency in searching information and knowledge, allowing its selection and minimizing information noise are the basic requirements. A librarian should also be equipped with general knowledge, to enable him to be conversant in a multitude of subjects. The current model of the librarians' university training is directed towards improvement in the scope of scientific information. Other extremely important issues are self–improvement and training. Librarians should serve as an example to the user living in the learning society, and it is the conception of lifelong learning that should be perfectly reflected in the person of the librarian. The two professions of computer scientist and economist should be combined by a contemporary librarian, because proficiency in the use of electronic tools, and a marketing approach to library and the marketing of its services is the only alternative in the case of hybrid libraries.

Barrier in Librarianship

Librarianship is not considered a prestigious profession in the society. A low social recognition decreases the motivation in the professional environment. However, librarianship is a profession with a future. There is a demand for new specialists in form of discipline librarians, systems librarians and electronic information specialists etc. Each specialization requires other competencies and skills, and each of those presents new challenges. A sense of professional fulfillment and satisfaction tend to be significant factors influencing the librarian's motivation.

Librarians are not motivated by lucrative career prospects. This needs to be clear to anyone considering a career as a professional librarian. However, "born librarians" are guaranteed satisfying careers. Social assessment reflects that the mission and character of our profession remains unclear, thereby requiring constant promotion and a change in the stereotypical perception of a librarian.

In the local context, unfortunately there are still some big libraries which are entirely dependent on print media. Automation of libraries is still a dream while employees are often seen performing all library house-keeping jobs manually. The attitudes of some librarians having charge of important libraries are really frustrating. As soon as they hear about computers or computer-related technologies in the LIS field, their first reflex is that such things are the realm of computer technicians, systems analysts, database managers, not for librarians or library people. Such behaviours on behalf of those at the head of institutions are detrimental to the library profession in general. They forget that technology

permeates all branches of learning, all disciplines and every sphere of our lives. Lawyers, engineers, medical practitioners, people of all walks of life need Information Technology in their daily personal and professional lives. If librarians and library employees are themselves not fully conversant with Information Technology, it is difficult to see them having a role in the information literacy programmes. They may not be of any assistance in bridging the digital gap.

CONCLUSION

The development of the modern world and requirements cast upon the society imply that librarians working among the richest sources of information are very important individuals providing access to information to be transformed into knowledge. And the crucial issue is not the debate whether the librarian is necessary, but the question of developing the model and standards of librarians' activity to become an integral part of modern society and its consequences, and to be perceived in this way by a more and more demanding user.

Libraries and Librarians can play a critical role both in making their users information literate and bridge the digital divide that exists at local, regional or national levels. Libraries can provide digitized full-text content, provide free access to computers and Internet and become national portals of digital information resources. In the changed environment, the librarian's role have to shift from that of information locator (custodian role) to that of an information evaluator and instructor in the use and evaluation of information sources. Library people have time and again complained about lack of training to develop ICT skills in employees. They wrongly believe that the onus of training falls entirely on their employers. In now days, no one is guaranteed a job for a life time. Only those persons have great chance of employability in such workplaces, who train themselves by constantly updating their skills and become multi-skilled and who are engaged in life long learning. In the past, employers made it a duty to train their employees but nowadays this responsibility is given less importance. In difficult economic situations, they downsize their personnel and redeploy those who suit the new market requirements. In the local context, our librarians and information workers need to give a serious thought about the exigencies of the 21st century and the skills required to meet all the forthcoming challenges.

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The challenging Role of LIS Professionals in Digital Era

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ABSTRACT

The digital environment of new millennium plays a pivotal role in LIS profession. This has given big challenging roles to the library and information science (LIS) professionals all over the world. The present article is an attempt to highlight different roles and responsibilities of library professionals' perform in the digital era.

Keywords: Digital library, ICT, Library professionals

INTRODUCTION

The advent of computers, information communication technology (ICT) changed the appearance of libraries, earlier the libraries were considered as storehouse of knowledge but at present they are the centers of dissemination. Now, the concept of digital environment has become more popular because it has power to catch a vast amount of information. Libraries and information centers have been using digital resources and services to satisfy the diverse information needs of users.

The Global changes particularly in digital environment /ICT have had an impact on the functioning of libraries. The development in ICT has changed the users' expectations from the libraries in many ways. In this age of information, the LIS plays not only just an important learning-supporting function but the library itself is emerging as a site of learning, sometimes more important than even the class-room. The library and information services of higher education institutions play a central role in

enhancing the quality of academic and research environment. In today's high-tech learning environment, the library as a learning resource is taking up increasingly more academic space and time in the life of a learner. In future, it will be even more so (Seetharama, 2006).

The digital environment has changed the functions and duties of LIS professionals, they are not only to extend assistance to users in searching information in a place called library but also to provide services and instruction regardless of place, time or format (Sivasubramaniam and Nikam, 2007). Now library professionals act as information provider, Net – based service provider, Website designer, Database developer, Service provider, Collection developer, Consortia manager, Information consultant or Service consultant, Content manager and so on, wising their avenues.

WHY DIGITAL LIBRARY?

'The tremendous growth of information compelled the libraries and information centers to computerize the information and to store electronically so as to retrieve immediately. Thus, the digitized information source is the concept of a new era. Digitization can give new life to valuable resources and enable access to a broader community. As the use of technology become a core part of the libraries all over the world, computer based systems are now considered essential for many operational aspects of libraries and information centers. The information explosion confined to all disciplines, so digitization of documents is best solution to retrieve library resources. The need for digitization can be due to the following:

1. All the knowledge cannot be incorporated in a single library. Hence, resources sharing are facilitated in the digital era.
2. Digitization helps to gain access to holding of libraries world-wide through automated catalogues.
3. Library is a growing organism and space problem likely to arise in future. Digitization helps to overcome the space problems.
4. Optimizes search and simultaneously search internet, commercial databases and library collections (Khan, 2007)'

WHAT IS DIGITAL LIBRARY?

In general term, the information is selected, acquired, processed, organized, stored, retrieved and disseminated in digital form is known as digital library. In computer science term, digital library is 'Content collected on the behalf of users' and in LISC term, digital library is that place where all information is available in a digital environment.

According to Gladney H.M, et.al. :

"A digital library service is an assemblage of digital computing, storage, and communication machinery together with the software needed to

reproduce, emulate, and extend the services provided by conventional libraries based on paper and other material means of collecting, storing, cataloguing, finding, and disseminating information."(Gladney H.M, et.al. 1994)

Association of Research Libraries has identified the following five elements in various definitions of the digital libraries:

1. The digital library is not a single entity;
2. The digital library requires technology to link the resources of many
3. The linkages between the many digital libraries and information services are transparent to the end users;
4. Universal access to digital libraries and information services is a goal;
5. Digital library collections are not limited to document surrogates; they extend to digital artefacts that cannot be represented or distributed in printed formats. (Association of Res. libraries, 1995)

INFORMATION COMMUNICATION TECHNOLOGY (ICT)

The ICT is the complete system of technologies. It comprised with two strong technologies, one is information technology which actually deals with the hardware and software elements that allow us to access, store, organize and manipulate the information by electronic means. The second is communication technology, which deals with equipment, infrastructure and software through which information can be received, accessed and disseminates, for example phones, faxes, modems and networks etc (Chauhan and Murthy, 2004)

ICT has been defined as an electronic technology. It is used for collecting, storing, processing and communicating information. ICT infrastructure is usually considered with respect to its main areas like computer, hardware, software, and telecommunication and information education (Davarpanah, 2001)

The ICT provides the information services effectively to fulfill the complex needs of the users. The emergence of ICT has transformed library services to a great extent, many information sources which were earlier available only in hard copy but are now available in electronic form. It enables e-acquisition, e-cataloguing, OPAC, e-circulation, e-serial control, e-database, e-books, e-journal, e-encyclopedia, e-dictionaries, e-mail, internet, library network, library consortia, web-designing, blogs/wikis and other various types of databases in the simplest way and to the best satisfaction of the users. Thus, it made possible that users can use and interact easily, speedily around the clock at anywhere in the world.

IMPACT OF DIGITAL ENVIRONMENT / ICT

The impact of digital environment or ICT is enormous and global in its magnitude. The ICT has profoundly affected library operations, information resources, services, staff skills requirements and users' expectations. It has virtually unlimited potential for a variety of useful applications in libraries as it significantly contributes to improve quality, increased productivity, more efficient operations, better resource sharing and more effective services to the users. The proper exploitation of new technologies in library is no longer a matter of choice but a matter of survival in an era of rapidly changing world of information technology (Seetharama, 2006). The ICT has converted whole network of information system of the world into a small global village.

THE ROLE OF LIS PROFESSIONALS

Libraries and information centers have been using ICT technology based resources and services to satisfy the diverse information need of their users.

Now main thing is that, what is demanded by LIS professionals of the 21st century, it depends upon who is asking the question, a general public, human resource executive or corporative or company's executives. The corporate sector or companies want such LIS professionals who are highly – trained, expertise in knowledge, have significant experience in information management, self motivated etc, they could safeguard the company's precious proprietary as well as actively participating in detecting clues for relevant information, gaining access the relevant information sources, searching and synthesizing data, repacking information and adding any other value added information that enhance the effectiveness of the organization.

Dynamic changes brought by ICT are really providing multiple roles and responsibilities to LIS professionals, now they are not only information collector and preserver of information resources but help the users in accessing and interpreting information resources also (Gupta, 2007).

We can summarize overall role LIS professionals in context of digital environment:

Information provider

One of the most important role and responsibility of library professional is providing access to globally generated information to the users. Only library professionals can guide the users to retrieve relevant information. That is why; we can say that library professionals serve as information provider also.

Net-based service provider
The library professionals are net-based service provider. They guide as users to retrieve net-based information from a large number of resources which are available on web. They provide easy access to web resources and educate users with a systematic approach to collect the information to support their jobs.

Website designers
Library professionals act as website designer. They create library website and current information on various subjects and display it on the library website and a good number of users regularly use this service.

Database developer
Library professional can also act as database developer. They create library database with international standard format for easy retrieval of information.

Service provider
LIS professionals provide solutions rather than volumes of literature that contains the solutions. They provide SDI and CAS services to users in proactive manner.

Subject gateways
In traditional information management library professional filter and process information so that the users can search catalogue and indexes of organized knowledge. Subject gateways work on the same principle, they employ LIS professionals to select, classify and catalogue the internet resources to aid search and retrieval for the users (Arora, 2009).

Collection developer
With the advancement in ICT, today's LIS professionals play as collection developer as they are shifting from print media to electronic media. Their skills and knowledge towards changing environment involve very complex activities of library.

Consortia manager
LIS professionals also act as consortia manager, due to rapid growth of knowledge, use of ICT, changing behaviour of user, lacking of funds, LIS professionals alliance with other libraries for common benefits, it is not under any institutional control but usually restricted to a geographical area, number of libraries, types of materials, and subject of interest which is established to develop and implement resource sharing among members.

Information consultant

Without consulting LIS professionals, a user can not retrieve the full potential of information available to them. LIS professionals provide instruction, guidance and direction to consult the information resources. As information consultant, LIS professionals interact with user, determine user's need, analyze the resources and give specific resources that are related to their needs.

Content manager

LIS professionals can also act as content manager because they decide what is necessary for their institution. Typically a content manager manages resources for a particular course or departmental website that can be consulted in a flexible manner for various purposes such as training an undergraduate course via digital or virtual environment.

Site manager

LIS professionals can act as site manager. They decide which site may be sited on the internet.

CONCLUSION

The digital era has changed the role and responsibility of LIS professionals. Now they do not act as intermediator but to be sources of information themselves, so they are the ICT savvy. The digitization involves in every activity of library and enhances the efficiency and effectiveness of library.

At last, we conclude that the LIS professionals of tomorrow will only survive if they can provide the complex amount of information services better than the user themselves and accepting the challenges in positive spirit.

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Web 2.0 to Library 2.0 and Librarian 2.0: A Paradigm Shift

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ABSTRACT

This paper aims to discuss the concept of web 2.0, its characteristics, tools (blogs, wikis, RSS feeds, social networks, podcasting, tagging and Instant Massaging etc.) and possibilities to incorporate these tools and technologies in library and information services. It focuses on transformation of library services from Web 2.0 to Library 2.0 and the role of Librarian 2.0 in digital environment. It also seeks the fundamental constraints in implementation of Library 2.0 especially in Indian scenario.

Keywords: Web 2.0, Library 2.0, Librarian 2.0, Blogs, Wikis, RSS

INTRODUCTION

Library 2.0 (L2) is a transformation in the way library services are delivered to library users. It provides new tools to make the library space (both virtual and physical) more interactive, collaborative and driven by community needs. It encourages collaborative two-way social

interactions between library staff and library customers. L2 requires user participation and feedback in the development and maintenance of library services. The phrase was coined by Michael Casey in his blog, Library Crunch, in 2005, although the concepts that collectively make up "Library 2.0" existed well before then. The term was a spinoff of "Web 2.0" which had been coined by O'Reilly Media.

CONCEPT OF WEB 2.0

Concept of "Web 2.0" began with a conference brainstorming session between O'Reilly and Media Live International. Dale Dougherty, web pioneer who have noted that the Web was more important than ever with exciting new application and site popping up with surprising regularity. Wikipedia defines Web 2.0 as "an idea in people's heads rather than a reality. It's actually an idea that the reciprocity between the user and the provider is what's emphasized. In other words, genuine interactivity, if you like, simply because people can upload as well as download." It includes a social element where we generate and distribute content often with freedom to share and reuse. This can allegedly result in a rise in the economic value of the web as user can do more online. It is also called as social networking.

CHARACTERISTICS OF WEB 2.0

Web 2.0 is the method by which data and services previously locked into individual web page for reading by the human beings can be liberated and then reused. It has lead to the information explosion to the globe.

The following are important characteristic of Web 2.0

- Web 2.0 permits the building of **virtual** applications, drawing data and functionality from a number of different source as appropriate.
- Web 2.0 is **participative**. The traditional web has tended to be some what one sided with a flow of content from provider to viewer, it allows the user to actively participate online by means of blogging, sharing file or equivalent.
- User can **own** the data on a Web 2.0 site and exercise control over that data.
- Web 2.0 is **smart** application which will be able to capture user's knowledge and deliver services to satisfy their needs.
- Web 2.0 is built upon **trust**, whether that is trust placed in individuals, in assertions or in the users and reuse of data.
- Web 2.0 is about **sharing**: code, content, ideas.

WEB 2.0 TOOLS IN LIS

Blogs

It is a powerful two-way based tool. A blog is a website where library users can enter their thoughts, ideas, suggestions, and comments. Blogs entries known as blog posts are made in journal style and are usually displayed in reverse chronological order; entries listed in specific categories that can be searched; links to other sites of interest and places for comments; and a monthly archive of previous entries. A blog entry might contain text, images or links to other blogs and web pages. Any library user can publish a blog post easily and cheaply through a web interface, and any reader can place a comment on a blog post.

LIS Applications

- Blogs serve as a platform where the users can file their concerns, queries and suggestions regarding the services and activities of the library,
- Blogs can be used as another form of publication.
- Blogs can also be used for the collection development where the users request the resources,
- Blogs can be used tools for marketing of the information as well as the library,
- Blogs can serve as discussion forum.

Wikis

A wiki is a webpage or set of WebPages that can be easily edited by anyone who is allowed access (Ebersbach et al., 2006). It can also be called as "electronic chalks boards". Wikipedia's popular success has meant that the concept of the wiki, as a collaborative tool that facilitates the production of a group work, is widely understood. Wiki pages have an edit button displayed on the screen and the user can click on this to access an easy-to-use online editing tool to change or even delete the contents of the page in question. Simple, hypertext-style linking between pages is used to create a navigable set of pages. Unlike blogs, wikis generally have a history function, which allows previous versions to be examined, and a rollback function, which restores previous versions.

LIS Applications

- Wikis can be used for social interaction and discussions among the librarians & users as well.
- Wikis can also be used by the users to share information and enhance the content, and a record of these transactions is archived for future reference.

- Reference resources wiki can be built for frequently asked questions.
- Wikis can be used for creating subject guides, subject gateways.

Really Simple Syndication (RSS)

RSS (most commonly expanded as "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. RSS uses an XML that summarizes information items and links to the information sources. It informs users of updates to blogs or websites, which are interested by the users. Many web browsers have built-in-feed readers or aggregators, and can easily add feeds to web page.

LIS Applications

- Announcement of the availability of new books and other resources in a given subject area.
- Librarians can subscribe to RSS from the sources for compiling their customized alerts.
- Promote events organized in the library for Library Users.
- Enhance Library Instruction for different Web 2.0, Library 2.0, Blogs, Wikis, RSS, Tagging, Podcasting, IM programs/courses by integrating appropriate resources.
- Announce availability of new research and learning opportunities in various academic/ research departments.
- Integrating library services through RSS feeds.

Instant Messaging (IM)

Instant messaging (IM) is a collection of technologies that create the possibility of real-time text-based communication between two or more participants over the internet or some form of internal network/intranet. IM has become increasingly popular due to its quick response time, its ease of use, and possibility of multitasking. It is estimated that there are several millions of IM users, using for various purposes viz: simple requests and responses, scheduling face to face meetings, or just to check the availability of colleagues and friends.

LIS Applications

- Instant clarifications for the Questions from users and vice versa.
- Reference librarians can also send text, video and audio files such as library instruction files, ready references etc.

- Online meetings
- For providing virtual reference services.

SOCIAL NETWORKING

A social network service focuses on building online communities of people who share interests and/or activities, or who are interested in exploring the interests and activities of others. Most social network services are web based and provide a variety of ways for users to interact, such as e-mail and instant messaging services. Social networks are built upon a hypothesis that there exists a determinable networking structure of how people know each other. Social networking could enable librarians and patrons not only to interact, but to share and change resources dynamically in an electronic medium. Users can create accounts with the library network, see what other users have in common to their information needs, recommend resources to one another, and the network recommends resources to users, based on similar profiles, demographics, previously-accessed sources, and a host of data that users provide. A social network thus can be formalized into a net structure comprising nodes and edges. Nodes represent individuals or organizations. Edges connecting nodes are called ties, which represent the relationships between the individuals and organizations. Myspace and FaceBook are two popular social networking sites launched during 2003 and 2004 respectively. Myspace allows organizations to create their own profiles, pages and can be used by libraries. But Facebook allows individual librarians to create profiles.

LIS Applications

- Libraries can create a page to approach to new users
- Social networking could enable librarians and patrons not only to interact, but to share and change resources dynamically in an electronic medium.
- For building network among the interested group in discussing the common interest
- User content can be added to the library catalogue, including users book reviews or other comments

Podcasting

A podcast is a series of audio or video digital-media files which is distributed over the Internet by syndicated download, through Webfeeds, to portable media players and personal computers. Though the same content may also be made available by direct download or streaming, a

podcast is distinguished from other digital-media formats by its ability to be syndicated, subscribed to, and downloaded automatically when new content is added.

LIS Applications

- Podcasts promotional recordings about the library's services and programs.
- Podcast highlights about new resources
- Podcasts enable librarians to share information with anyone at any time.
- Podcasting can be a publishing tool for users and librarians' oral presentations.

Tagging

A tag is a keyword that is added to a digital object (e.g. a website, picture or video clip) to describe it, but not as part of a formal classification system. 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. The concept of tagging has been widened far beyond website bookmarking, and services like Flickr (Photos), YouTube (video) and Audio (podcasts) allow a variety of digital artifacts to be socially tagged.

LIS Applications

- Tagging can be applied to the LIS for editing the subject headings from the user point of view and there by enhancing the indexing and relevancy of the searches, making the collection more dynamic.
- Tagging would greatly facilitate the lateral searching.

Web 1.0 Vs Web 2.0

E mail	--> IM
DoubleClick	--> Google AdSense

Ofoto	--> Flickr
Akamai	--> BitTorrent
mp3.com	--> Napster
Britannica Online	--> Wikipedia
personal websites	--> blogging
evite	--> upcoming.org and EVDB
domain name speculation	--> search engine optimization
page views	--> cost per click
screen scraping	--> web services
publishing	--> participation
content management systems	--> wikis
directories (taxonomy)	--> tagging ("folksonomy")
stickiness	--> syndication

Library 1.0 Vs Library 2.0

Closed stacks	--> Open stacks
Collection development	--> Library suggestion box
Preorganized ILS (Integrated Library Services)	--> User tagging
Walk-in services	--> Globally available services
"Read-only" catalog	--> Amazon-style comments
Print newsletter mailed out	--> Team-built blog
Easy = dumb users	--> Easy = smart systems
Limited service options	--> Broad range of options
Information as commodity	--> Information as conversation
Monolithic applications	--> Flexible, adaptive modules
Mission focus is output	--> Mission focus is outcome
Secured inventory systems	--> Collaborative discovery systems
Content consumer (Patron)	--> Content creator (Patron)
ILS is core operation	--> User services are core

With library 2.0, the collection becomes virtual that is library without walls. Importantly, the traditional library read only catalogues will become Amazon style comments where the user comments, reviews and feed backs will be used for enhancing the catalogue. Information is viewed as a two way process in library 2.0 where in the users search, investigate and participate in the creation and re-mixing of the new content. The mission focus is not on the mere output but on the outcome of an organization. To summarize, library 2.0 focuses on user and how to attract the user as information consumer as well as contributor.

LIBRARIAN 2.0

In new era of information technology, the librarian should have called themselves as "Librarian 2.0". First and foremost, Librarian 2.0 understands his or her users at a deep level. Librarian 2.0 understands

end users deeply in terms of their goals and aspirations, workflows, social and content needs, and more. Librarian 2.0 is where the user is, when the user is there. This is an immersion environment that librarians are eminently qualified to contribute it. Librarian 2.0 is the guru of the information age. Librarian 2.0 strives to:

- Understand the power of the Web 2.0 opportunities.
- Learn the major tools of Web 2.0 and Lib 2.0.
- Combine e-resources and print formats and is container and format agnostic.
- Is device independent and uses and delivers to everything from laptops to PDAs to iPods.
- Develop targeted federated search and adopts the Open URL standard.
- Connect people and technology and information in context.
- Doesn't shy away from non-traditional cataloging and classification and chooses tagging, tag clouds, folksonomies, and user-driven content descriptions and classifications where appropriate.
- Embrace non-textual information and the power of pictures, moving images, sight, and sound.
- See the potential in using content sources like the Open Content Alliance, Google Print, and Open WorldCat.
- Connect users to expert discussions, conversations, and communities of practice and participates there as well.
- Use the latest tools of communication (such as Skype) to connect content, expertise, information coaching, and people.
- Use and develops advanced social networks to enterprise advantage.
- Connect with everyone using their communication mode of choice - telephone, Skype, IM, SMS, texting, email, virtual reference, etc.
- Encourage user driven metadata and user developed content and commentary.
- Understand the wisdom of crowds and the emerging roles and impacts of the blogosphere, Web syndicasphere and wikisphere.

IS LIBRARY 2.0 POSSIBLE IN INDIAN SCENARIO?

The implementation of library 2.0 concept is very difficult in Indian libraries and information centres. The following fundamental problems might be barriers for library 2.0 activities especially in Indian scenario:

Financial crunch
Finance is the motive power. It is essential for running any institutions properly. As we all know that libraries are growing institutions and not a revenue fetching institutions, so it requires that an adequate financial support must be given to the libraries for their technological advancement and better library and information services.

Lack of ICT infrastructure
Indian libraries are lacking of basic ICT infrastructure. Most of the libraries do not have computers, networking, internet and other basic requirements to modernize a library.

Technical illiteracy in library personnel's as well as users
In most of the Indian libraries, library personnel's are working manually, so they are not aware about emerging technologies and latest advancements in the field of computer and information technology.

Lack of motivation
Motivation and encouragement are an essential positive energy to do something new in any organization. In Indian scenario most of the institutions are working on traditional aspects. Peoples are not being motivated or encouraged by their respective authorities. So they are not being able to incorporate new and latest technologies in their routine works.

Lack of training & orientation programme
Training and orientation programme are the key to be update with the latest and emerging technologies. But in Indian context these kinds of activities are not being organized in libraries in a routine manner, therefore library personnel are not being trained with new technologies.

Lack of learning spirit
Library personnel have lost their learning abilities due to lack of motivation, training, finance and required ICT infrastructure.

PRINCIPLES OF LIBRARY 2.0

In November 2005, a white paper that Ken Chad and Paul Miller wrote called "Do Libraries Matter? The Rise of Library 2.0." put forth some interesting ideas of Library 2.0 and where libraries are heading. (Chad and Miller, 2005)
"Library 2.0 is a concept of a very different library service that operates according to the expectations of today's library users. In this vision, the library makes information available wherever and whenever the user requires it."

Library 2.0 requires evolutionary change across a wide range of systems, processes and attitudes. They detailed the following four principles:

The library is everywhere

Library 2.0 is available at the point of need, visible on a wide range of devices, and integrated with services from beyond the library such as portals, Virtual Learning Environments and e-Commerce applications. With Library 2.0, libraries move beyond the notion of 'libraries without walls', in which they offered a destination web site that attempted to reproduce the total library experience online. Instead, relevant aspects of that library experience should be reproduced wherever and whenever the user requires them, without any need to visit a separate web site for the library. Information on loans, for example, should be available from within a local authority portal or a university Virtual Learning Environment (VLE) or Course Management System (CMS). However, the pervasive library is not just about ensuring that a library is able to offer its services to you in ways and places that meet your needs and integrate with your workflow. The concept also recognizes how technological improvements enable us to move beyond the highly fragmented offering currently available to UK citizens towards notions of a truly national library offering.

The library has no barriers

Library 2.0 ensures that information resources managed by the library are available at the point of need, and that barriers to use are minimized. In Library 2.0, there is an active presumption that use and re-use of resources is both permitted and actively encouraged. In line with recent legislation and emerging best practice, there is an expectation that information resources managed by the library on behalf of its users should be available for them to use and re-use wherever, whenever and however they see fit. Rather than being hidden in catalogues with a single web interface, stored in proprietary databases only visible via a project's web site, or accessible only to users of certain machines physically connected to particular networks, Library 2.0 resources should be more widely exposed. They should be available to the wider web, visible to search engines such as Google, and harvestable into new applications and services built by the library, and by third parties.

The library invites participation

Library 2.0 facilitates and encourages a culture of participation, drawing upon the perspectives and contributions of library staff, technology partners and the wider community. 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 or even, in the case of the wiki, to edit the content. This is what we call the Read/Write web. Library 2.0

is about encouraging and enabling a library's community of users to participate, contributing their own views on resources they have used and new ones to which they might wish access. With Library 2.0, a library will continue to develop and deploy the rich descriptive standards of the domain, whilst embracing more participative approaches that encourage interaction with and the formation of communities of interest.

The library uses flexible, best-of-breed systems

Library 2.0 requires a new relationship between libraries and a wide range of technology partners; a relationship in which all parties work together in pushing the limits of what is possible whilst ensuring that core services continue to operate reliably. A Library 2.0 empowered library challenges the traditional procurement paradigm. The old model, where a formal tender process that typically includes a detailed specification of requirements and a complex contract, is awarded to a single supplier who builds and delivers the application over many months or even years, is replaced. Instead, components are mixed – they are not subcontractors to one another. The solution is flexible and responsive. It adapts to changing technologies and requirements, and the library is free to swap components as newer and more appropriate ones become available in the market place. Consequently, these libraries cannot think in terms of a monolithic 'ILS' but must use best of breed components that adhere to standards, enabling modules to interoperate. This library must engage and actively participate with a wide range of technology partners, ensuring that a modular and interoperable set of core systems remains reliable and robust. At the same time, the library must continually seek opportunities to push existing library services across new channels to new users, and to engage with existing and potential users in different ways that make sense to them.

CONCLUSION

All together, the use of 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. Library 2.0 is user-centered; a multi-media experience; socially rich; and communally innovative. It also focuses a definition for the term: "The application of interactive, collaborative, and multi-media web-based technologies to web-based library services and collections."

Library 2.0 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.

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Application of Total Quality Management in University Libraries of Agra

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ABSTRACT

The purpose of present study is to draw all the aspects of application of TQM in university libraries of Agra (DBRAU and DEI (Deemed) university libraries). Questionnaire was issued to each library to collect the data on the library's information products and services, leadership, policy and their attitude towards the services offered to users. The data could be thus be collected from these university libraries and analyzed for the purpose. At the last some suggestion and recommendations are made on the basis of Data analysis.

INTRODUCTION

Information technologies are becoming more sophisticated every day, and users' expectations and their demands on librarians are becoming increasingly complex. Accordingly, librarians keep seeking new ways to respond to those demands through technology-based solutions. The most significant development in information technology in the last 25 years is the Internet. It has brought new challenges and opportunities to users, who are able to access extended information from their own computers instead of going to the library for the same information. Librarians have been quick to adopt this technology and to use the Internet in order to meet user demands.

HISTORICAL DEVELOPMENT OF UNIVERSITY LIBRRAIES IN AGRA

Dr. B. R. Ambedkar University

Agra University owes its inception to the Agra University Bill of 1925 passed by the Legislative Council in 1926. The Governor assented to it on September 11, 1926. This bill was promulgated in 1927. Agra University remained an affiliating University having its writ over U.P. C.P. Rajasthan etc. The name of Agra University has been changed to Dr. Bhim Rao Ambedkar University w.e.f. 26 September, 1995.

Library & Research Facilities

The library has 1, 86,000 books, Journal subscription 173, Periodicals from different countries in exchange for the University. The library has 215 Journal of Research.

The library has seating capacity of 130 and there are 12 cubicles for research work and 4 seminar rooms. Affiliated colleges, three institutes and six teaching departments have their own specialized libraries. The library of Institute of Social Sciences has 18,000 volumes and K.M. Institute of Hindi Studies has 39,000 books besides a good collection of rare manuscripts and standard books of reference. The library of Institute of Home Sc. has 10,218 volumes. The University has bound various Research Journals.

DAYALBAGH EDUCATIONAL INSTITUTE (DEEMED UNIVERSITY)

The Government of India declared to be a University from the session 1981 – 82, (by merging erstwhile, Engineering College, Women's Training College and Radhasoami Educational Institute, affiliated to Agra University) under Section 3 of the University Grants Commission Act. The Institute has since been accorded the membership of the Association of Indian Universities. The Institute comprises of the faculties of Arts, Commerce, Education, Engineering, Science and Social Sciences. From the session 1986 – 87, the DEI Technical Collage, Dayalbagh, a diploma level Engineering Institution, and from the session 1995 – 96, the DEI Prem Vidyalaya Girls' Intermediate College, have also been brought under the academic and administrative control of the Institute.

Library & Research Facilities

The library has 153661 books, 7695 Bound Volumes, subscribing 182 research periodicals and 1000 dissertation/thesis. The library has sitting capacity of 250 users at a time. Besides these there are three separate Faculty Libraries and many departmental libraries. Library has xerographic section, computer section (Internet) and scanner, printers, CD-Writer, Zip-Drive etc. to users. The access of 4000 electronic journals is also provided by the library with UGC-Infonet programme. The library has developing a very sound infrastructure for automation and will be accessible very shortly through high power integrated library DBMS software.

OBJECTIVES

Quality may be seen as the total composite product and services characteristics of marketing engineering, manufacturing, and maintenance through which the product and service in use will meet the

expectations of the customer. It is very clear that there is an urgent need to provide quality based library services. The libraries are facing many problems in adopting TQM and the new technologies. The study will find out these problems faced by these and will be suggest the solutions. The objectives of the study are as follow:

- To ascertain the relevance of quality management principles to relating to library services in electronic environment.
- To identify strategies and applications of Total Quality Management in university libraries.
- To conceptualize and develop criteria for defining and measuring excellence in services of university libraries.
- To ascertain quality trends, challenges and opportunities as are relevant to university libraries.
- To finding the solutions of problems faced by these libraries in adopting the new technologies.

TOTAL QUALITY MANAGEMENT

Total quality is total in three aspects. It covers every process, every job, and every person. ***First:*** it covers every process, rather than just manufacturing or production. Design, Construction, R&D accounting, marketing, repair and every other function must be involved in quality improvement. ***Second:*** total quality is total in that it covers every job as opposed to only those involved in making the product. ***Third:*** total quality recognizes that each person is responsible for the quality of his or her work and for the work of the group. Total quality also goes beyond the traditional idea of quality which has been expressed as the degree of conformance to a standard or the product of workmanship. Now, organizations accept and apply the concept that quality to the degree of user. In other words, the customer determines whether or not quality has been achieved in its totality.

TQM DEFINED

The modern concept of quality is defined as conformance to requirements, and requirements are defined as the task to be accomplished in meeting customer needs. Quality cannot be inspected into the products or services; the customer satisfaction must be designed into the whole system. The confirmation check then makes sure those things according to plan[3].

In general, TQM is defined as follows:

- Quality is to satisfy agreed customer requirements continually.
- Total quality is to achieve quality at low lost.

- Total quality management is to obtain total quality by involving everyone's daily commitment.

Some of the management experts like **Jurow & Barnard** define TQM as "a system of continuous improvement employing participative management and centered on the needs of customers."[1]

According to **ISO** definitions Total Quality Management is "management approach of an organization centered on quality, based on participation of all its members and aiming at long terms success through customer satisfaction and benefits to all members of the organization and society."

J. L. Riggs (1979)[2] says that "Today quality control is taking on the emphasis of quality assurance the means to achieving true product reliability. Reliability cannot be inspected into a product, it must be designed and built in"

TQM is a management philosophy that seeks to integrate all organizational functions (marketing, finance, design, engineering, and production, customer service, etc.) to focus on meeting customer needs and organizational objectives.

The ability to fulfill customer requirements is essential not only between companies but within the same company or in organization. In every organization, every department, every section and even every small unit is a series of customers and suppliers. He / She has to meet his/her customer's requirements.

TQM views an organization as a collection of processes. It maintains that organizations must strive to continuously improve these processes by incorporating the knowledge and experiences of workers. The simple objective of TQM is "Do the right things, right the first time, every time". There are a number of evolutionary strands, with different sectors creating their own versions from the common ancestor.

APPLICATION OF TQM IN UNIVERSITY LIBRARIES OF AGRA

One questionnaire was issued to the Librarian in both University libraries of Agra to collect data on the existing situations and practices and the future planning with regard the application of total quality management in library services., has been analyzed and interpreted in the paragraphs and tables that follow –

In all tables the following abbreviations are used to indicate the university libraries:-

CLBRAU- Central Library, Dr B.R. Ambedkar University

CLDEI- Central Library, Dayalbagh Educational Institute

Table No. 3.1- Opinion regarding the participation in Decision making helps in implementation in Decision making.

S.N.	OPINIONS	LIBRARIES	
		CLBRAU	CLDEI
1	Yes	---	√
2	No	√	---

Table No. 3.2 TQM should be applied in Libraries

S.N.	OPINIONS	LIBRARIES	
		CLBRAU	CLDEI
1	Yes	√	√
2	No	---	---

As per table no. 3.2 - Both the libraries agree on that TQM should be applied in libraries.

Table no 3.3 Have you tried TQM in your library

S.N.	OPINIONS	LIBRARIES	
		CLBRAU	CLDEI
1	Yes	---	√
2	No	√	---

As per table no 3.3 – CLBRAU is not tried to apply TQM in library. **CLDEI** is trying to apply TQM in their library.

Table no 3.4 - Have you applied statistical process to your library?

S.N.	STATISTICAL PROCESS	LIBRARIES	
		CLBRAU	CLDEI
1	Yes	---	√
2	No	√	---

As per table no 3.4 - Statistical process is helpful in the application of TQM. Table indicates that **CLBRAU** has not applied statistical approach to their library, but **CLDEI** applied statistical approach to their library.

Table 3.5 Is your libraries is ISO certified

S.N.	ISO CERTIFIED	LIBRARIES	
		CLBRAU	CLDEI
1	Yes	---	---
2	No	√	√

Table no 3.5 – Both the libraries have not got ISO 9000, as it is a standard of quality. Table **3.6** Have your library employed additional staff since, application of TQM

S.N.	STAFF EMPLOYED	LIBRARIES	
		CLBRAU	CLDEI
1	Yes	---	---
2	No	---	√

As per table no 3.6 - CLDEI has not appointed additional staff for application of the TQM.

Table 3. 7 Library structure changed since, application of TQM

S.N.	STRUCTURED CHANGED	LIBRARIES	
		CLBRAU	CLDEI
1	Yes	---	√
2	No	---	---

As per table no 3. 7 - CLDEI has opinion that their structure of library have not changed due to application of TQM.

Table 3.8 Do you think TQM bring positive affect

S.N.	STAFF EMPLOYED	LIBRARIES	
		CLBRAU	CLDEI
1	Yes	√	√
2	No	---	---

As per table no 3.8 - Both the libraries agree on that TQM will bring positive affect in libraries.

Table No 3.9* you're Leadership

S.N.	LEADERSHIP	LIBRARIES	
		CLBRAU	CLDEI
1	**Do you think Leadership plays a significant role in accomplishing the desired level of efficiency in the library**	To full extent	To full extent
2	**I consider the importance of different teams for the improvement of the processes, procedures and practices**	To full extent	To full extent
3	**I believe that all of us have more or less equal potential**	To some extent	To some extent
4	**I praise verbally in public for outstanding performance and condemn privately for poor performance.**	To a little extent	To great extent
5	**I support open decision making through brainstorming**	To full extent	To full extent

As per table no 3.9 - Both libraries think leadership plays a significant role in accomplishing the desired level of efficiency in the library and **importance** of different teams for the improvement of the processes, procedures and practices **to full extent.** Both believe that all of us have not more or less equal potential **to some extent. CLBRAU** praise verbally in public for out-standing performance and condemn privately for poor performance **to some extent** and **CLDEI to great extent.** Librarians support open decision making through brainstorming **to full extent.**

Table 3.10.* your policy and strategies

S.N.	POLICY AND STRATEGIES	LIBRARIES	
		CLBRAU	CLDEI
1	**The vision, mission, goals, objectives and values of the library are conveyed through staff orientation programme**	To great extent	To full extent
2	**I like to align library culture, strategy, environment and technology For effective service.**	To full extent	To full extent
3	**I provide all information to my subordinates and let them jointly find the solution to a problem.**	To a little extent	To full extent
4	**I make clear library policy and strategy to the staff**	To full extent	To full extent
5	**I take help of focus groups, user survey and personnel interview for information needs assessment.**	To a little extent	To full extent

As per table no 3.10 - **CLDEI** say that vision, mission, goals, objectives and values of the library are conveyed through staff orientation programme **to full extent,** and **CLBRAU to great extent. Both libraries** like to align library culture, strategy, environment and technology for effective service **to full extent. CLDEI** provide all information to their subordinates and let them jointly find the solution to a problem **to full extent,** and **CLBRAU to a little extent.** Both librarians make clear library policy and strategy to the staff **to full extent.** Librarian of **CLDEI** takes help of focus groups, user survey and personnel interview for information needs assessment **to full extent,** and **CLBRAU to a little extent.**

Table 3.11* your staff management

S.N.	STAFF MANAGEMENT	LIBRARIES	
		CLBRAU	CLDEI
a.	**I consider library staff as an asset to be developed rather commodity to be used.**	To great extent	To full extent

b.	**I focus on education, training and re-training for continuous improvement.**	To great extent	To full extent
c.	**I do not hesitate to delegating the responsibilities and authority to my mature subordinates**	To great extent	To full extent
d.	**I do not consider seniority as the best criteria for promotion**	To great extent	To great extent
e.	**I have provided intercom telephone service in each section of the library for horizontal and vertical communication.**	Not at all in	Not at all in

As per table no 3.11 Indicates that both libraries do not provide intercom telephone service in each section of the library for horizontal and vertical communication. **CLBRAU** consider **parameter** (a to d) **to great extent** and **CLDEI, to full extent**.

Table 3.12* your resources

S.N.	RESOURCES	LIBRARIES	
		CLBRAU	CLDEI
	I help in proper allocation of library budget for optimum utilization.	To full extent	To full extent
	I want to provide qualitative library services at a nominal price	To full extent	To full extent
	I prefer to select library suppliers and vendors on the basis of quality rather on price.	To full extent	To full extent
	I am using latest information technology with proper based culture	To full extent	To full extent
	I keep library building, books and furniture clean	To full extent	To full extent
	I keep all the equipments and instruments in proper condition.	To full extent	To full extent

As per table no 3.12 - Indicates that both librarians consider resources to its **full extent**

Table no 3.13.* your library process

S.N	LIBRARY PROCESS	LIBRARIES	
		CLBRAU	CLDEI
a.	**I take the help of staff members and users in designing new processes and dropping the obsolete processes.**	To some extent	To full extent

b.	**I give chance to individual employ to improve the processes of his/her work.**	To full extent	To full extent
c.	**I authorize my staff to identify processes in small activities.**	To some extent	To full extent

{ 1 2 3 4 5 }

The asked range is from -
1 = to full extent; 2 = to great extent; 3 = to some extent; 4 = to a little extent; 5 = Not at all

As per table no 3.13 - CLDEI take all step **to full extent** but **CLBRAU** take b **to full extent** and other **to some extent.**

RECOMMENDATIONS AND SOLUTIONS

As the fast emerging information society is becoming more complex, competitive and dependent on technological changes and information explosion, the need for quality information service to the customers is also growing and becoming very essential. Since information is now considered as an important resources for socio-economic development of society, value added information service can only provide the conformance to the requirements of the user and user satisfaction which can only be advised by the implementation of TQM principles in libraries.

Technical process

CLBRAU is still keeping manual catalogue along with the automated systems. Due to the latest technological developments, importance of cataloging and classification has been minimized as a large no access points such as key-word search, word from little etc. are available for information retrieval. But for physical arrangements of books on shelves, classification is still a very important tool. Therefore, it is recommended that university libraries should use the latest updated classification schedules.

In the present age when powerful computer devices and integrated library software available it does not make any good sense to assign a document a call no like (xxx.xxx.yyy) and so on[4]. Libraries may no longer be fussy about punctuation marks and other such little useful aspects prescribed by catalogue codes rather should instruct matching to do all sorts of permutations and combinations in ding all such jobs for our patrons in design fashions.

Quality in Services

Circulations

Different systems and procedures are used for the purpose of circulation in different situations in concerned university libraries. But the emphasis seems to be in most of cases on security aspects of the loaned materials rather than satisfying user queries.

For the application of TQM, the systems in operation of university libraries should by and large provide for quick and accurate information on the following:

- Where a particular document is at any given point of time.
- When it return, if issued.
- How to serve it.
- Subject wise issue/return statistics (as TQM recommends that library should adopt the statistical approach to their operations/services).
- Category-wise/area wise issue/return statistics, etc. so essential indicators for ensuring judicious & optimum use of the collection, ii) further enriching the collection.

Reference Service

As reference queries attended to by university libraries is very low the researcher asked to users for this, they answered that i) library staff are not willing to answer of their queries ii) they don't gave accurate answers.

For the TQM, the staff should be willingly attends the user's queries. In TQM approach, it is no quality, if for example reference queries attended by library increased this year to 400 from 250 in previous year, if all 150 extra queries were attended incorrectly. More statistics have no value in terms of quality. It advocates for **"better"** service rather than "more" service.

Inter-library loan

As survey reveals that users of university libraries are not getting requested material by them on ILL to full extent. It is recommended that libraries should acquired up-to-date locational (place position) tool and they should link themselves to other libraries by WAN & LAN for this purpose.

Xerox Services

It has shown that liberal photocopying services rendered by the libraries have not only minimized document losses, page tearing, scribbling marking etc but also attracted the users to the libraries when assured of

the document or its photocopy. Users of university library especially of CLBRAU are not satisfied with the Xerox facility of their library. It is recommended that university libraries should made efforts to provide the service with minimum lead time and quality copy would be the elements, the TQM approach would be looking for within this service.

User Education

As majority of the users are not satisfied with this programme of studied university libraries. It is recommended that users are continuously and regularly acquainted and updated with the learning resources held by the libraries in their respective area/s of interest rather than following one time and out of date one-way instructional approaches.

Documentation Services

As users of the university libraries are not fully satisfied with CAS & SDI services of their library. Now users have becomes more information conscious and are willing to pay for quality information products and services.

It is recommended that this is the high time for libraries to wake-up, accept this challenge and take it up in all earnestness, employ new management concepts, marketing techniques and generate quality products and services to meet the need of their respective user rather than continue with issuing ill designed, less appealing, illegible, routine products, like in the form of "current contents", "current additions" Bibliographies and so on. Libraries also may improve their financial condition and conditions of products to apply the marketing techniques in their special services.

Time

Time is a quantitative measure of the quality of library services. As survey reveals that (responses obtained from the questions asked to user that they attain their queries within thrice minutes) users of the libraries are not getting their required information within in time. Usually amount of time used in the library depends on the efficiency of the whole system of library. It is assume that good search tools, organization efficiency and matched number of user requests for information substantially contribute to shortening the time the users spends in library. The university library should improve their retrieval process etc. by applying the computers in their systems and other related less time consuming system.

Staff development and training

Through use of questionnaires librarians and library staff were asked about their trainings and development, find that their training is not satisfactory. Training and re-training employees is an essential element in the quality process. It is recommended that library manager should

organize workshop on INTERNET, handling customer on application of TQM in libraries staff also be sent to outsider places. Library staffs who attend significant training programmes are invited to make presentation to the entire staff or to selected departments.

Quality team

It is also recommended that university libraries for TQM approach/model a team of four/five library staff should be appointed and charged with developing a plan for quality improvements. Key elements of quality team's action may be follows:

- involve everyone on staff
- identify internal and external customers
- improve customer satisfaction
- increase opportunity for customer interaction and feedback
- provided value-added services
- encourage innovation and efficiency
- communicate openly and
- identify staff training, education and development opportunities

It is recommended that every year library staff should be nominated from their ranks individuals whose performance has made a significant contribution to customer service or to achievements of library goals and objective. A winner is then should be selected by the library administrator. This will motivate the staff members to performing their duties.

Any thinking on the TQM would be incomplete if the most crucial element the staff, responsible for making it happen are not given due attention. Quality will definitely come up when every individual in library is taken into confidence and when all of them are made clear about the library's mission goals and objectives. This element presupposes that the pursuit of quality must begin from the top to down. Not compartmentalization, but total integration brings quality. Encouraging risk taking and driving out fear results in creativity.

It is also **recommended** that time to time librarians should conduct customer survey for their assessment of services offered. Librarians should place the suggestion boxes in their libraries, as suggestion boxes may provide valuable information on the interfaces between user and library.

General Suggestions

As per the observation the studied Libraries are providing services beyond & hrs scheduled timing. Users of both libraries demanded more opening hrs due to they are not providing services to the user after the

scheduled time of their university. It is recommended that concerned university libraries be increased their opening hrs as per user's demand.

It is recommended university library should devise a mechanism to ensure balanced growth of library collections by appropriate budget allocation among various competing subject areas is an essential pre-requisite for healthy collection development. It leaves no scope for some areas to be very rich and some very poor.

The library should also increase their collection in electronic form as per the user requirements and update the hardware of computers in their libraries for speed-up the process of retrieval.

It is recommended that CLDEI should speed-up the work of computerization. Library personnel should be trained continuously to exploit the electronic information resources. The constraints faced by the libraries in computerization so library should appoint extra employ with the computer background and request to be made for more financial assistance for computerization.

Both libraries should be used bar-code in circulation system and other system for speedup the work.

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Building Collection, its Organization and Exploitation: A Continuum of Information and Knowledge Management

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ABSTRACT

The paper lays emphasis over the misconceptions of management, as it is not the present day concept but has been there since ages rather the realization has come late, otherwise the knowledge and information used to be managed in past as well. Emphasis has been also laid on the data management along with information and knowledge management which is managed by information and knowledge managers, who actually had been always putting in tireless efforts to make knowledge and information readily available.

Keywords: Collection Development, Knowledge Management, Information Management

INTRODUCTION

Management is not a new concept, it is just what we learned and realized in our selves as an activity, which we every time do intentionally or unintentionally, and we had been in this business since coming into being and this can better be judged by looking at the order in nature, as how efficiently and effectively nature manages everything, whether from birth to death of a person or in the form of ecological balance, which nature strikes effectively. Now what makes the difference is the conscious, calculated and constructive applications of management, which not only helps in bringing order out of disorder but do help in reaping the dividends in various forms. Quality in any service is the ultimate aim of any organization and so is in library and information institutions.

Ones we are talking about management it means we are concerned about future, because management is the activity of future as how far we are able to combat the unforeseen events of future, and management definitely has come to our rescue. It is our past which leads us to think of future by working on follies in present to secure future. proper and better understanding of the term management is imperative, as, the way the information technology has intruded in every sphere of human activity, same is what management is doing, there is hardly any sphere of human activity in which management hasn't made its presence felt and this is what we are experiencing in library and information science, which is no exception to it. Information management or knowledge management are terms which are very often being used in the changed environment of Library and Information Science, where the world has actually become the service oriented and it is the fittest which can only survive.

So thereby using the terminology of the present day world is definitely a great rescue, because to whom we are supposed to serve is a modern man who always keeps on talking about the time constraints, which is an established fact in view of the amount of work these people want to and have to accomplish in their life time.

MISCONCEPTION OF THE MANAGEMENT

The terms management science in LIS is more often either misunderstood or nether understood and for this we need to address the basic questions like what actually the management is, because most of the time we have seen people talking about and using a mix of terms to upkeep themselves for the attainment of longevity and the better acceptance in the profession but without actually working on such areas and without having a clear understanding of the concepts. Like people often quote terms like

- Information Technology
- Digital age
- Digital-divide
- Virtual world and
- Information and Knowledge Management (IKM) etc.
- ICT

All these and many more without having a clear idea of the concept and we believe the same is happening yet again, with the way the library professionals are using management in every sphere. As most of the library professionals in our country received misapprehension that what actually the management is all about, this may appear very simple by far, but the fact it remains that most of the time the term is misunderstood, hence becomes a futile exercise. As, merely by using terms information and knowledge management is not an end in itself, unless and until we

are not going to work on it along with maximizing the use of this organized and managed information and that is possible only when exploitation of information becomes integral part of information and knowledge management

INFORMATION AND KNOWLEDGE MANAGEMENT IN PAST

Information and Knowledge management is not a new concept; the practice is prevalent since ages, rather since the inception of libraries. I believe libraries and information centers are managing the information and knowledge since their coming in to being and their coming in to being is wholly solely based on the management of information and knowledge. By using the new terms and concepts we can not take away the role and contribution these houses of wisdom have made in the propagation and procreation of knowledge and information both by managing and disseminating it efficiently and effectively.

We cannot under mine the role of libraries in managing the resources the way they had been managing things so long. When we talk about the cataloguing or classification of books, it is just because of the efficient management of past, cataloguing and classification in itself is a process of management and putting the whole collection of library into use in itself tells the tale of effective management of both information and knowledge. The difference I find in the two is, in present day world we are using the new terms and concepts as the same were missing in past otherwise there is no difference in the role these institutions are going to play with the mere usage of terms like information and knowledge management. It is just simply a process of remaining in the market which is driven by technology and management and this is perhaps when and how the present day world is going to accept us otherwise the tool management is not going to turn things up side down for us overnight. Rather it is something like eating while seating on ground and the eating while seating on the dinning table and what we eat on dinning table is what we used to eat while seating on ground so the difference is just simply in the method of serving and not in our consumption. So it is just simply a process of 'CANNIBALISATION' which we nowadays use in management science, which means the process of overtaking by either devouring something or by giving a new shape to a dyeing product or service by working on its deficient areas.

Thereby we are not supposed to undermine the management in past. Yes, the concept is a new fangled term to this science but what we are trying to do is to simply please our customers with the way they are expecting us to oblige them and if one has to survive one must change with the changing environment of the society other wise it takes no time to one to perish, because to remain in race and to make ones presence felt is

imperative with continuous and constant learning, which leads to ones growth and development and hence its survival.

INFORMATION AND KNOWLEDGE MANAGERS

On one hand we talk about information and knowledge management and at the same time we are not ready to accept the new and inevitable designations to the people from whom we are expecting the information and knowledge be managed. As unless, the people doing so if not held as managers, how come we expect the same be managed under managerial tag. If the role, services, standards, methods and other ways and means of rendering service to clientele in this ever changing world has changed manifold, then it becomes utmost important rather indispensable to change ourselves as well so that our clientele should accept our designed product, which is the information and knowledge.

Library professionals with more appealing designations have become inevitable. And for this designating every university librarian as Director Library instead of chief librarian or librarian and the hierarchy should go like Deputy Director and Assistant Director Library, also the designations like Information officer can be used instead of librarian and in the same way we can use Assistant Information officer and senior and junior Information assistant. As some of the research organizations designate these professionals as Information Scientists and in corporate world the same is being designated as Information Manager, knowledge Manager or Library Manager. And it is then, we will be having people of this sort to whom we can call as knowledge mangers or information mangers, and it not just simply that we need to stick to our traditional system of providing information and not ready to accept the changed environment, which is as important as the acceptance of new terms, services, role, and responsibility, which should match with the profile of the person and it is there after we can make the knowledge and information to get managed properly.

INFORMATION MANAGEMENT

Information is something like a message received and understood as it is a collection of facts from which conclusions are drawn. As we can the see information management is the combination of the two words information *and* management, information means any processed data which we can put to use, and management helps in exploiting this information as it remains readily available in libraries and information centers and to make it readily available is something which can be owed to as a managed part or the process which belongs to the management section of the information house.

The application of the principles of management to the acquisition, organization, control, dissemination and use of information in the

libraries and information centers is the information management.

KNOWLEDGE MANAGEMENT

Knowledge is about learning and reasoning and is a psychological result of perception and is acquired through study or experience or instruction. knowledge as we know is the product which is the out come of the prolonged information and it is this knowledge which leeds us to wisdom, by wisdom here we mean the fruit which our efforts are going to bear after so much care and nurturing of data and information and this is possible only when the both are properly managed. Knowledge is acquired Knowledge Management (KM) refers to a range of practices used by organisations to identify, create, represent, and distribute knowledge for use and reuse, awareness and learning across the organisation and institution..

Knowledge management involves not only all activities of Information Management but some more specialized activities centred on creation and recording of new knowledge and sharing it. Knowledge management is concerned with tapping the tact knowledge (knowledge which cannot be easily codified) and create an environment that would facilitate the creation of new knowledge and sharing it for organizational developments.

- Shared intelligence
- Improved performance
- Competitive advantage
- Higher levels of innovation
- Greater focus on the management of specific knowledge assets
- Development and cultivation of the channels through which knowledge flows

TOOLS FOR INFORMATION AND KNOWLEDGE MANAGEMENT

1. Trained Human Resource as a greatest tool
2. Cataloguing and Classification
3. Particularized/specialized Technology as a tool
4. Technology as a tool
5. Knowledge organization by conventional and modern methods
6. Every innovative method both implicit and explicit for knowledge exploitation

EFFECTIVE INFORMATION AND KNOWLEDGE MANAGEMENT

- Information and knowledge management is the key for the

survival of library and information professionals in this competitive world, where the greatest challenge is in the form of Internet and the World Wide Web, which are providing information at the lightening pace and to have a decisive edge over this technology is imperative and where we have to work on making the presence of human factor always felt.

- I am of the firm belief that in order to get highly professional managers for the information and knowledge management we need to introduce a post master's degree diploma in knowledge and information management in library and information science of one year duration. This will not only help in producing quality managers but will also boost the placement of highly trained information professionals in corporate world, which is booming.
- Papers like 'Knowledge Management' and 'Information Management' can be introduced at Bachelors and Masters Degree level of library and information science. This will help a lot to students to get well versed with the tool management and its usage, especially while working as knowledge managers with other tools like IT which has already intruded in to this science.
- Competence is always must and to have manpower of such sort is utmost important and it is thereafter we can make this industry to drive, survive and thrive and for this we need to procreate people with enhanced features and that is possible only when we will groom them with the quality techniques of information and knowledge management.
- To teach management as a whole subject to LIS students is impossible, so, what we need to do is to choose some aspects of management science, which we find important for the managerial practice of information and knowledge management.

<u>This may include</u>

- introduction to management science
- management process and behavior
- marketing management of information products
- Strategic management in collection, digitization, preservation etc. of information products.
- Documentation Management.
- HRM in knowledge based organization
- Human resource information system and various others.

All this can be studied under different papers, as mentioned above during the two years programme and the subject material

can be initially drawn form the management science itself and later the subject can drive its own material by continuous and constant research as per the need and requirement of market and the industry itself.

- When we are talking about the information and knowledge management it means we are ready to meet the challenges which this industry is going to pose us. For this we need to have an appealing designations of the professionals who are working with such an industry, like people are not going to easily accept the library professionals as the information and knowledge manager, for this we need to designate them as information officers or information managers of library managers or knowledge managers which is must for the acceptance of the professionals among the information seekers.
- When we are talking about knowledge management or information management we need to be ready for external threats and that is from private entrepreneurs, who are employing non professionals in their organizations to handle the management services of information and knowledge or at others hire the services of highly professional people of other fields to do the same for them. And in order to tap this market or over come this problem we need to attract private entrepreneurs towards our products, which is in the form of our students, but this is possible only when our produce will be highly proficient in the concerned field. We can assure them of industrial documentation and upkeep of various information resources which are always needed for the better growth and development of an organization.
- In continuation to above suggestion we need to lure private entrepreneurs to make investments in information sector as they can enter in to market by opening up Information Dissemination Clinics (IDC's), these clinics will work totally on fee basis. As unless we are not going to value our commodity people are not going to accept it worth use. For this the seeker of information may submit his/her request for the type of information requirement one needs at his/her nearest information clinic, which will be connected to different clinics across the country or globe, which in turn will be connected to its parent organization. Information data base will be maintained by every clinic as per the information requirements of their market clientele to provide readily available information and at times when the help is needed from parent body the same can be sought. But what's more important is these clinics should be maintained by highly trained persons in totally sophisticated network environment.

CONCLUSION

Information and knowledge management is nothing different from that of our conventional method of managing knowledge, but one must always change with the changing environment, which is always imperative for the survival. In recent past we used to do it with the help of tools like classification and cataloguing and in present we are going to do it with the help of tools like Technology and Management, and in future we may experience exceptionally new tools and techniques to handle it, which to a larger extent is inevitable. But definitely what we need not to underestimate is the new concepts as it is not just the fusion of terms but what is the biggest challenge before us is to justify this fusion, which is not going to be that easy what it appears by far. Besides it is going to help a great deal in recognizing this service oriented profession to its optimum with new challenges, where we have to work on external environment, which is full of 'Opportunities' and 'Threats' along with our internal environment where we have to assess our own 'Strengths' and 'Weaknesses' in perhaps totally a new environment, which indeed and un-doubtably is going to be totally service oriented and what we call in management science as SWOT analysis.

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True Perception of Knowledge Management in Digital Information System and Technology

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ABSTRACT

In this advanced age of network technology world-over, after the telegraph, the rail, the telephone and the electricity the foremost front-runner network technology is the internet. It has surpassed all networks in connecting people world-over and giving them what otherwise was a brain work and memory oriented network of a human being. It has revolutionized the lives of all and sundry who have adopted this as their guide in their work philosophy. Not even a genius may come parallel to this technology. This latest technology has revolutionized every body's life style, working capacity, connecting each other with the latest knowledge management and information communication technology, so as to save time, energy, labour and human efforts of those who have adopted this as their guide, which otherwise would have done none better. It is a boon to many, whether it is in relation to a library, lawyers' pursuit, doctors' dilemma, commercial world, University's and Educational Institutions, scientists, farmers and the like. Everybody is taking enough credit in day to day public life if he has adopted this as one of his rule of daily life. The judiciary, along with the lawyers, has taken great strides in informing themselves in a moment on the internet and also for what is their day to day work schedule, and what they have delivered even the litigant knows it whether he is far away from the seat of the Supreme Court at New Delhi, and knows the result of his fate on the internet. It comes clean on the internet. What else you should expect from this network facility? It does miracles. It works like a magician. Everybody is thrilled.

Keywords : Internet, Knowledge Management, Knowledge Society

INTRODUCTION

Knowledge management, means and includes a channel where knowledge is stored of the desired discipline in a digital

information system. It is just as there are pigeon holes in crores to store a particular information knowledge, specific in terms and application, which may be utilized immediately to reach to the desired results. Take the case of an efficient librarian. He gets in a fraction of minute the desired information of the book or thing and conveys it to the person concerned, and books etc. grow, they are continuously stored in the so called pigeon holes of the internet, and thus the treasure of knowledge is enhanced continuously and simultaneously the management of this becomes easier and simple, which we term knowledge management. As the global information's of the World carry the research work by different nations, countries, and institutions, it should become an obligation of each of them to transmit there knowledge to other nations, countries and institutions so as all are benefited by the work of the other, if not, then it is a treacherous attempt to sideline others who themselves, by passage of time, would build up its own, but that only would be a loss of time, energy and money, which otherwise could be saved. Look to the advancement now that we have found water and other things on moon, and that has been possible only when digital information system was developed and put in active practice, through launching of rockets, and putting them in sphere for a number of months and getting connected to earth for the information's on moon and other planets Intellectual property rights (IPR) are conferred by the society and the Government on those individuals, or organizations for inventions carried out for the benefit of the mankind to cheer and encourage their inventions. Now these inventions are knowledge informations, worthy of knowledge management, finding place on the internet. It would be idle to name the philosophers who christened many of these words, because there are many distinguished ones, a list of which shall be too long and tiresome to mention.. To name a few, we have Microl Polanyi who differentiated between the tacit or personal knowledge and the explicit, or external knowledge domains; Stephen Gourlay (Gourley, 2002) presented a clear definition of tacit knowledge as a form of personal knowledge and context, very specific and deeply rooted in individual experiences, ideas, values and emotions. The French Philosopher Philippe Baumard provided the most extensive treatment of tacit knowledge for knowledge management, and he laid emphasis that tacit knowledge is important because expertise rests on it; and because it is the source of competitive advantage. I have to leave at his enumeration of

philosophers because, as said earlier, the list of them would be too long and tiresome.

The socio-economic growth and political governance are undergoing towering changes putting the Governments to test and enact laws relating to management of knowledge as the Copyright Act, 1957, failed to thwart the piracy of computer software from the internet. Piracy as such is crime. It hoodwinks the real gainer from his inventions, which, in effect, would demoralize the inventor. It is a socio-economic crime, the backbone of the society and the Government is broken financially by the person, who, actuated for his own financial gains, commits piracy and marches ahead of the real person who should have gains of his inventions, and not the one who is wholly unconnected with the invention. Thus the internet is not used for the purpose it took birth. In my opinion, the information Technology Act, 2000, is not coming to effectively control the piracy. The person who commits piracy is no less a criminal than a murderer, or a raper and should be punished by awarding death sentence, and his properties and gains impounded to be handed over to the real inventor. What is more astounding is that the criminal, after committing this crime of piracy, within a short period of time, flees away to an unknown destination. Let the government take care of it in the right earnest.

CONCLUSION

Experience shows that every invention has a use and misuse. When atom was discovered to ease the living of the people safe and comfortable, it was put to misuse by manufacturing atom bomb. Everybody is aware of the horrors of Hiroshima (Japan). The arms race has not yet halted, though vouched to be not used in practice to injure a nation or a country. The ill glory of Adolf Hitler, and that of Napleon Bonapart are dimming in practice, yet there are some who are thinking of expansion of their empire because of their enormous ill conceived notion of brutality. The giant countries have not yet come to terms with the smaller and less progressive countries. They have not thought of the survival of the latter. In the name of aid the economy is thrashed to the hilt of the smaller and economic down trodden countries. Unless this is halted by the communion of the world like the United Nation Organizations (U.N.O) little can be done for the mankind. I pray,

some one should wield the mantle to handle this situation in the world.

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Impact of Knowledge Management: An Overview

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ABSTRACT

Knowledge Management is emerging as a key concern of organization, particularly those who have already redesigned their business processes and embedded a total quality approach into their practices. KM may mean management of knowledge both explicit and tacit knowledge. It caters to the critical issues of organizational adoption, survival and competence in face of increasingly discontinuous environmental change. KM requires linkage of information with information, information with activities and information with man –so as to realize the sharing of knowledge. It plays an important role for libraries and library professionals to improve library services, record, information, create knowledge and enables users to share to learn by providing user friendly approach in all the activities. Library is a storehouse of knowledge which means that library store documents which contain knowledge. This papers emphasizes the growth, scope, need, objectives etc. of knowledge management as well as role of library professionals.

Keywords: Knowledge management, Role of LIS Professionals.

INTRODUCTION

The new millennium has unfolded a vital sense of interconnectedness all over the globe emerging the knowledge revolution which has increased the extensity, intensity, velocity and impact of global interactions, changing the configuration of global power. Knowledge economy is a knowledge based economy. In the knowledge economy era, the management refers to effectively identify, acquire, develop, resolve, tacit and explicit and to raise the emergency and innovation capability by utilizing the wisdom of the team. Since, Knowledge has become the driving force for social development, the attention of the society information and knowledge is rising and peoples demands for information and knowledge increasing step by step. This has provided a good environment for library development. Moreover, as information and knowledge has become an productive factor for the modern

economic system, the society will inevitably require intensified management of information and knowledge. As for as KM in libraries is concerned it should be focused on effective research and development of knowledge, creation knowledge bases, exchange and sharing of knowledge between library staff, speeding up explicit processes of the implicit knowledge and realizing of its sharing. Library professionals are already ushered into knowledge management activities and practices and the paradigm shift that is taking place whereby libraries are getting transformed into KM centers. KM will inject into new blood into the library culture. The main contents include mutual trust, open exchange, studying, sharing and developing knowledge operation mechanism of libraries enjoying the KM process.

MEANING

Knowledge management is a process which deals with knowledge creation, acquisition, packaging and application or reuse of knowledge. It caters to the critical issues of organizational adaptation, survival and competence in face of increasingly discontinuous environmental change. It embodies organizational process that seek synergistic combination of data and information processing capacity of information technologies and creative capacity of human being. KM is about enhancing the use of organizational knowledge through sound practices of information management and organizational learning. It is the process of transforming information and intellectual assets into enduring value. KM is basically consists of following four steps :-

- Knowledge Collection
- Organization
- Data Protection and presentation
- Dissemination of Knowledge information

NEED FOR KNOWLEDGE MANAGEMENT

There is a sufficient evidence of many organizations and institutions who have benefited from KM initiatives. The need for KM for any organization is :

- Service areas are increasingly competitive and rate of innovation is rising.
- Most of the organizational work is informational.
- Reductions in staffing create a need to replace informal knowledge with formal method.
- Competitive pressures reduces the size of the workforce that holds valuable business knowledge.

- Products and services are increasingly complex endowing them with a significant information component.
- Accelerating rate of innovations that need to be assimilated at an even faster rate.

OBJECTIVES OF KNOWLEDGE MANAGEMENT

The main objective of knowledge management is to ensure that the right information is delivered to the right person just in time in order to take the most appropriate decision. The objectives are as follows :

- To enhance the knowledge environment so that the environment in conductive to more effective knowledge creation transfer and use.
- To promote scientific research.
- To create knowledge repositories which store both knowledge and information often is documentary form.
- To manage knowledge as an asset and to recognize the value of knowledge to an organization.
- To promote relationship between library and users.
- To protect the intellectual property right in information technology era.

K M IN LIBRARIES & ROLE OF LIBRARY PROFESSIONALS

The role of knowledge management in libraries will become more and more important along with the development of knowledge economy. Devenport explains that K M as a process is about acquisition, creation, packaging and application of reuse of knowledge. In any organization, the libraries are the backbone of information dissemination and the different services offered by the libraries are mainly designs to fulfill the goals of the organization. In the knowledge economy era, the libraries will attach importance to vocational training and lifelong education of library staffs to raise their scientific knowledge level and ability of acquiring and innovating knowledge. K M in libraries is to promote relationship in and between libraries, between library and user, to strengthen knowledge internetworking and to quicken knowledge flow. The objective of K M in libraries is to promote knowledge innovation which is the core of knowledge economy society. The role of librarian is not restricted to information management only but also plays an important role in K M program and identifying, acquiring, developing, resolving, storing and sharing of knowledge. Library Professionals have to manage relationships with external providers of information & knowledge and should negotiate with them. There are some qualities of Librarian to become a successful Knowledge manager :

- Providing services to the user community.
- Sharing the information and understanding the user need.
- Ability to effectively teach end users individually and in groups.
- Analyzing the documents, classifying and storing them for easy retrieval.
- Knowledge of current advances in information systems and technologies and their application in libraries.
- Having Knowledge of the digital library,concepts, current and new advances in the scholarly communication systems, e-publishing and creating knowledge databases.

CHALLENGES OF KNOWLEDGE MANAGEMENT

Every Library Professionals who works in library wants to use the techniques of K M to achieve the organizational goal and provide better service to its user but there is some challenges for implementing Knowledge Management :

- Intellectual Capital: managing of tacit knowledge is not easy, because we don't know what is in human mind. It is not possible to document tacit knowledge.
- Culture: Because of narrow mindless or insecurity majority of people don't want to interfere they want to say neutral and they are away from knowledge sharing.
- Technology: Due to rapid changes in technology it is difficult to communicate the knowledge to user because, technology helps knowledge manager to a large extent.
- Overloading: Knowledge gets accumulated. If obsolete information is not removed its leads overload. And it is difficult to identify which is useful from this information.
- Obsolescence :- There are types of information which gets obsolete as soon as it is generated for ex. Stock market information. Because of these types of ever changing information it is difficult to give this information quickly to capable user.

CONCLUSION

Knowledge Management is not managing or organizing books, journals, searching the internet for clients or arranging the circulation of materials. However, each of the activities can in some way may be part of K M. It is an evolution of good management practice sensibly and purposely applied. In spite of the fact that there are many knowledge base products in the market, none of them suited for libraries or flexible with the dynamically changing environment in the IT era. With a concerted effort,

use of IT in knowledge management will help to increase libraries operational efficiency and cater to ever increasing needs of clientele.

Librarians are predisposed to sharing information and consider sharing information as their mission; they are both effective and customer oriented. Librarians understand the ways in which people communicate information needs and their patterns of information use. Librarians in future, would move from the background to the center of the organization. Librarians 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.

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Indigenous Knowledge Management: Some Issues

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ABSTRACT

The paper points out that knowledge is a dynamic process and is always extending its boundary. It states that Indigenous Knowledge (IK) is a key element to the society, which is practiced and cultivated in the society from ancient past. The paper discusses the specialties and importance of IK. It highlights on the Indigenous Knowledge Management System, Indigenous Knowledge Exchange pattern, IPR issues, etc. The great role of Knowledge Organization Centre and Library are also discussed in this paper.

Key Words: Indigenous Knowledge, Indigenous Knowledge Management System, Knowledge Organization Centre, Library].

INTRODUCTION

What is Knowledge? There is no common definition of knowledge. Scholars have different opinion on this topic. However, definitions of knowledge as given by the eminent scholars may be stated here thus:

S. R. Ranganathan [1], the eminent Indian library scientist, defines knowledge: "The totality of ideas conserved by the humans. In this sense, knowledge = Universe of ideas".

According to information scientist J. Becker [2] "Knowledge is man's thought and experience. It can only result from understanding and using information".

H. M. Weismam [3] argues that "The longest lived, most persistent sort of information is called knowledge. Knowledge is the result of n act or state of understanding. It is the clear perception or learning gained through experience or ruminative cognition".

P. K. Jana [4] advocates that "Knowledge is the sum total of what is known the whole body of truth, facts, information, principles or other

objects of cognition acquired by mankind. The definition of knowledge extends to all thinks knowable, to all kind of knower, to all the models of knowledge and all the methods of knowing."

The term knowledge denotes in the International Encyclopedia of Information and Library Science [5] as "Knowledge is information evaluated and organized in the human mind so that it can be used purposefully".

If we look into all the above definitions of knowledge, we may easily estimate that scholars deepen studies broaden the conception of knowledge. It includes on the whole, to all things knowable, to all kinds of knower, to all the modes of knowledge and the all methods of knowing. Knowledge may be acquired by human beings through learning, understanding, feeling, conceiving, experience, commonsense, discretion, judgment, etc. Knowledge can be earned from earlier documents. It can be earned trough studying or observing the people, nature and locality also. So, knowledge is a dynamic process and knowledge is always extending its boundary. The preparation of knowledge documentation has started around 7500 B.C. only and generally it can be said that most of the world of knowledge remains void. Thus 'door step dewdrop' also remains undiscovered, which may be comparable with the local knowledge or indigenous knowledge.

INDIGENOUS KNOWLEDGE (IK)

Indigenous Knowledge (IK) practiced and cultivated in the society from ancient past, which demonstrates for the development of the society. Even in this modern society it may acts as the basis for community-level decision making in different areas pertaining to food security, human and animal health, education, natural resource management and other vital economic and social activities. IK is a key element to the so-called socially backward, the poor and it is their main asset to gain control over their own lives or to maintain own life style. For these reasons, IK is locally managed, sustained in the locality. It has lucrative survival strategies, which should be promoted in the development process of the society.

James D. Wolfensohn [6], President of the World Bank opines "Indigenous knowledge is an integral part of the culture and history of a local community. We need to learn from local communities to enrich the development process."

According to Warren [7], "Indigenous knowledge (IK) is the local knowledge – knowledge that is unique to a given culture or society. IK contrasts with the international knowledge system generated by

universities, research institutions and private firms. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural-resource management, and a host of other activities in rural communities.

What are the Specialties of IK?

Indigenous Knowledge (IK) has some specialties, which may be identified as follows:

Is always local knowledge normally practiced and cultivated.
Is the very exceptional to every culture or society and is the only one of its kind to the particular society.
Is the most helpful resource for the local-level decision making processes in different essential fields like:

- Agriculture,
- Health care,
- Food preparation,
- Education,
- Justice,
- Natural-resource management, and
- A host of other activities in communities.

It provides problem-solving strategies for communities and individuals.
It is commonly held by communities rather than biased by individuals.
It is tacit knowledge and deeply rooted through out community practices, institutions, relationships and rituals.
It is always vibrant and continuously growing and innovative.

Why is IK important?

Indigenous Knowledge (IK) is very important in the society. Some of the main reasons are as under:

a) It provides problem solving strategies for local communities, especially for the poor, different tribes and other backward class people.

b) It represents an important contribution to regional, national and global development knowledge.

c) It is relevant for the development process of the society.

d) It is an underutilized resource although has a state of potency for the development process.

e) Lastly, IK systems are at risk of becoming destroyed.

Flavier, et al. [8] argues that IK breeds from information. This is the information base for a society, which facilitates communication and decision-making. In their views, "Indigenous information systems are dynamic, and are continually influenced by internal creativity and experimentation as well as by contact with external systems".

It is also accepted that gathering Indigenous Information is very difficult task, because all these information are scattered thought out the locality, region or country. It takes time to gather Indigenous Information, as it is important to exercise each and every possible way of searching, so it is always time consuming. It should be kept in mind that no information be left out or overlooked on the basis of simple assumption that it is "obvious and every one knows it". The coverage of information should always be border in nature.

IK creates, retains in a locality. All these local level knowledge should be deposited in the central storehouse of knowledge by following some standard innovation methods. The process emphasizes on innovation and creativity in adopting traditional practices of IK in the light of the new contexts and needs of the present society. Although IK has established its validity over centuries but there are areas where scientific validation may be required prior to the sharing of such IK practices beyond the original context and location. Thus, in case of recommending the use of specific herbal medicine for the general public, scientific validation is essential, which can help providing assurances of its safety and effectiveness.

The variety of stakeholders covering community-based organizations, NGOs, the private sector, research, academia and government are now keenly interested on IK. All these institutions express their desires on functioning partnerships with the donor institutions so that significant enhancement and the chances of success in the use of IK may be developed and expand for the society.

THE ROLE OF LIBRARY AS KNOWLEDGE ORGANIZATION CENTRE

There should be the Knowledge Organization Centre or the Library, which may perform a great role to acquire, store, retrieve IK in scientific way and practice some processes to cleanse the raw indigenous data and information by adding some values. This Knowledge Organization Centre or the Library sort and arrange IK by adopting a logical and suitable classification method which will help to store it by date and time; by subject, facets and sub-facets properly and supply the knowledge quickly as and when demand placed. The role of Knowledge Organization Centre or the Library should be:

To recognize Indigenous Information and its application in the development process is a source of empowerment for local communities.

To learn about the Indigenous Information: for this learning, the right process would be investigating first what local communities know and have. Secondly, to improve understanding of local conditions and provide a productive context for activities designed to help the communities.

Indigenous Information gathering would be started from users, practitioners, and the older and other group of people of the locality who have a lot of information of the particular item or subject. The following methods may be used:

- Observation
- Interview
- Structured interview
- Questionnaire
- Group discussion
- Subsequent interactive processes are to be used to clarify the facts and to gather more relevance on Indigenous Information. [9].

INDIGENOUS KNOWLEDGE MANAGEMENT SYSTEM

Knowledge Management System is a powerful technique to manage, retrieve and serve or disseminate value added newly developed knowledge through using Information Technology, Internet and Portals. APJ Abdul Kalam [10] supports that, "Knowledge Management helps an organization to gain insight and understanding from its own experience. It also prevents intellectual assets from decay, adds to firm intelligence and provides increased flexibility. Digital library is an important component for capturing the explicit knowledge. This has to be supplemented with the implicit knowledge, which will eventually get transformed into a knowledge management system".

A creative approach to Indigenous Knowledge Management can result in improved, efficient, relevant, valued knowledge, which are always helpful to the society. Normally, it has four processes and some activities are to be required, which may be documented as under table – 1:

Major Processes involved	Major Activities required to complete the Processes
Gathering Indigenous	Data collection; Scan input; Image input; Voice

Information	input; Recording various source information; Provision for inclusion in future
Organizing Indigenous Information	Data entry; OCR; Metadata preparation; Indexing; Filtering; Linking to WWW
Refining Indigenous Information	Value adding; Contextualizing; Collaborating; Compacting; Projecting; Mining
Disseminating Indigenous Information	On demand within organization; Sharing with other organizations; Alert services; Internet Flow

Table – 1: Indigenous Information Possessing System

In the practical field Indigenous Information gathering from a particular village, town or locality, in three ways: a) Simple observation, b) Verbal record of information and c) Written record of information as main sources. The collected indigenous information remains in crude form and to be stored in digital form for easy future use. Indigenous Knowledge Management System is a tool, which accepts indigenous information and manages them with the help of some digital processing. The system will be found in figure –1 below:

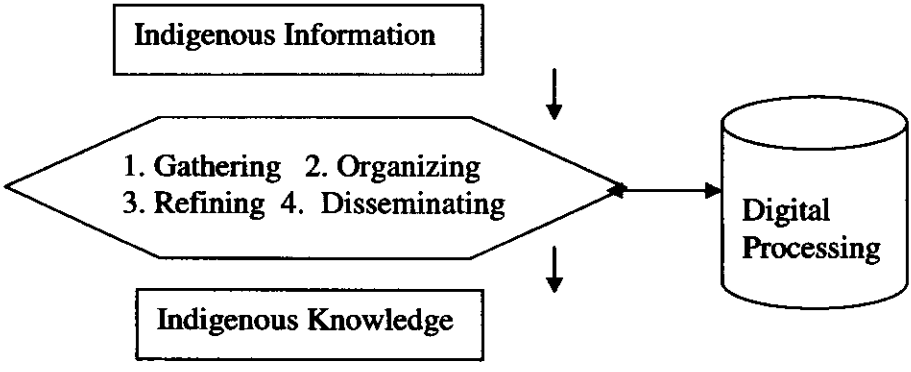


Figure – 1: Indigenous Knowledge Management System

The above processes finally generate value added new knowledge, solely based on traditional or indigenous knowledge, which were scattered in the locality. All the processes and activities, which are always tuning the indigenous information and make into indigenous knowledge is called the Indigenous Knowledge Management System.

IK exchange method

The exchange of IK is the ideal outcome of a successful transfer and dissemination. This is essentially a listening and learning process of the

community where an IK practice originates; the agent who transmits the practice; the community that adopts and adapts the practice - all are to learn during the process. Hear, listening and learning from communities - the priorities would be to:

- Encourage more countries to formulate and implement strategies for IK integration
- Enhance the capacity of national and regional IK networks
- Promote the local exchange and adaptation of IK
- Identify innovative mechanisms to protect IK in a way that fosters the further development, promotion, validation, and exchange of IK.

The integration of IK into the development process is essentially a process of exchange of information from one community to another. The World Bank has identified the process of exchange of IK within and between developing countries and between developing and industrial countries involve essentially six steps:

a) "Recognition and identification: some IK may be embedded in a mix of technologies or in cultural values, rendering them unrecognizable at first glance to the external observer (technical and social analyses may, therefore, be required to identify IK);

b) Validation: This involves an assessment of IK's significance and relevance (to solving problems), reliability (i.e., not being an accidental occurrence), functionality (how well does it work?), effectiveness and transferability;

c) Recording and documentation is a major challenge because of the tacit nature of IK (it is typically exchanged through personal communication from master to apprentice, from parent to child, etc.). In some cases, modern tools could be used, while in other circumstances it may be appropriate to rely on more traditional methods (e.g., taped narration, drawings);

d) Storage in retrievable repositories: Storage is not limited to text document or electronic format; it could include tapes, films, story telling, gene banks, etc.

e) Transfer: This step goes beyond merely conveying the knowledge to the recipient; it also includes the testing of the knowledge in the new environment. Pilots are the most appropriate approach in this step; and

f) Dissemination to a wider community adds the developmental dimension to the exchange of knowledge and could promote a wider and deeper ripple impact of the knowledge transfer". [11].

IK and IPR Issues

This is true that some of the organization have successfully recommends for the specific use of IK and that are especially true for addressing the issue of intellectual property rights (IPR). WIPO, a partner of the IK Program, has taken the lead in a global discussion and partnerships around the challenge of how to find innovative approaches to IPR as they apply to indigenous knowledge. Innovative approaches are necessary because existing arrangements may not be applicable to the specifics of IK. The normal criterion for patenting has some processes, which do not exist with IK: as Traditional knowledge is preserved through oral tradition and demonstration rather than documentation; more often it emerges gradually rather than in distinct increments.

Only in rare cases an individual inventor is to be identified. Some initiatives may help, such as encouragement to local communities to register traditional practices. Practical, cost-effective and "indigenous" examples of documentation also exist. Other evolving forms of protection of IK include Material Transfer Agreements (MTA) involving the provision of material (resources or information) in exchange for monetary or non-monetary benefits. Examples of fair and equitable benefit sharing between users and custodians of traditional knowledge can be found in several countries today.

CONCLUSION

From the above discussion it is clear that IK is very important for the benefit and future planning of the locality and the society. Though it is difficult and time consuming process to gather, organize, refine and disseminate; but if it is well designed, it can lead to the empowerment of local communities. It has the potential of being a valuable device for scale up local indigenous knowledge and concerns to the regional and global level also. The community knowledge can then be incorporated into the regional and national policy. There should be a policy regarding dissemination of IK and in that case state, regional and national portals must be created and that are to be accessed by the people through out the country.

IK is concerned with tacit knowledge, which is yet to be recorded or embedded as printed publication or in digital form rooted through various information and communication technology processes. In case of handling IK, library has a vital role, because library has already adopted skill for using information and communication technology for organizing

and providing its services to the end users. With the help of information and communication technology and Internet library has developed organizational skills, which intelligent enough to consolidate, repackage, customize and even personalize the information and knowledge content to satisfy the end users' need. Library can easily develop portals and gateways through which IK relevant information, actual practices and benefits are to be stored with proper classification and metadata preparation. This drive of library thus spreads IK, which is absolutely the local information and knowledge, to the world people through Internet.

In India more than 70% population lives in villages and they are in need of information regarding databases on natural and socio-economic resources along with indigenous knowledge. The Central Government, Government of West Bengal and some other State Governments have been set up several Village Knowledge Centres (VKC) Village Information Centres (VIC) and Information Kiosks (IK), which may provide free access to wide range of indigenous information and knowledge contents to the people living in the villages and thus enhance the effectiveness of spreading the reliable information to the village people.

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Knowledge Management for A Common Man: A New Step in the Cooperative Sector: A Case Study of EMS Cooperative Library, Kochi, Kerala

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ABSTRACT

The development of knowledge management in recent years has become the key concern for librarians and libraries. Knowledge management can be applied to non-profit organizations such a s government bodies and statutory boards. Knowledge management involves a complex process of aligning the company's mission statement with the best practices that enable the company to be competitive and profitable in its sector. This paper highlights the current practices of knowledge management by E M S co-operative library, a public library under co-operative sector in Kerala with its task of expanding the learning capacity of the public and thus promoting a gracious society. This library has also a mission to deliver a world-class library system which is convenient and useful to the people of Kerala state.

INTRODUCTION

In the era of Information Technology revelation management of knowledge and value added informations are very important. As the development of Information Technology (IT) and its applications in

Library and Information Centers, the concept of document management has been changed to information management and again the entire scenario of information management has started its change to Knowledge Management (KM). The main function of a modern public library is not to provide access to as much information as possible, but to provide knowledge management services. The main function is to help the citizen with managing information overload.

COOPERATIVE SECTOR IN INDIA

India has a rich history of cooperative movement. Co-operation was introduced in India mainly as a defensive organization for dealing with problems of rural indebtedness. With the acceptance and implementation of a planned economic development wedded to the ideas of socialism and democracy, co-operation became a dynamic economic instrument for achieving the social objectives of the national plan.

The philosophy of cooperation endeavor's to empower isolated individuals who are individually weak, to come together in a democratic manner on the basis of equality to achieve the desired common economic interest. The principles of co-operation define the basic characteristics of any cooperative organization. These principles form the common thread that run through all the co-operative societies with marginal variations.

There are many co operative undertakings functioning all over India for the well being of the society .

COOPERATIVE SECTOR IN KERALA

The Kerala Cooperative Societies Act came into force in May 1969 in order to enact a uniform law on cooperation applicable throughout the state. There after Government of Kerala passed the Kerala Cooperative (Amendment) Act 1999 this came into force in the year 2000, providing of membership to local body institutions, deposit guarantee scheme in primary agricultural credit societies, consortium lending scheme, cooperative development and welfare fund, independent election commission, separate audit wing and vigilance wing, and cooperative examination board are the new provisions made in the amendment act.

The Kerala state co-operative union is the principal agency imparting co-operative education and propaganda in the state. There are seven co-operative colleges and nine training centres in kerala to provide in service training to department staff, employees of co-operatives and also to public. Apart from the union, the national Co-operative union of India has started two institutes of co-operative management at Thiruvananthapuram and Kannur districts for providing advanced training courses to the department officers, employees and non-officials in co-operative sector.

The Co-operative Academy of Professional Education (CAPE) was formed to establish educational institutions in various professional fields to provide facilities for and promote education and training. The Co-operative Academy of Professional Education is promoted by the Co-operation Department of the Government of Kerala and is an autonomous society under Government of Kerala. Under the Co-operative Academy of Professional Education there are total seven professional colleges which includes management, engineering and medical college.

There are a number of Co operative banks running under co operative sector all over Kerala. The Ernakulam District Co-operative Bank Ltd., the leading District Central Co-operative Bank in Kerala, started functioning on 15th March 1961. The Bank is registered under the Travancore-Cochin Co-operative Societies Act, 1951. The Bank comes under Banking Regulation Act and Kerala Co-operative Societies Act 1969.

Technology leadership and unmatched customer service enables the bank to meet the challenging needs of the clients efficiently and effectively. The best use of Information Technology, in tie up with the world class IT vendors, bank provides the best of breed service to customers. Bank implemented Centralized Online Real time Electronic Banking solution (CORE BANKING) since March 2004 to provide modern banking service to the customers in all walks of life. Ernakulam District Co-operative Bank is the first in the co-operative sector in Kerala, and the 2nd in India, that implemented CORE Banking.

The Bank runs a library for the benefit of general public named after the famous thinker, ideologist, EMS (E.M.Sankaran Namboothiripad). The EMS Co-operative library is one among the best in India having 7,200 members and a book base of 70,000. Separate sections for visually challenged people and collections of Sri. M. Krishnan Nair are the major attractions of the library. This is the only public library in Kerala which runs under the cooperative sector.

ROLE OF PUBLIC LIBRARY IN BRIDGING DIGITAL DIVIDE

When we talk about digital divide it is not the 0's and 1's that we have missed access to, instead it is the information- the nucleus of all developmental activities. Libraries that have been in existence for the primary cause of acquiring, organizing and disseminating information seem to have thrown out of the very network of bridging the digital divide paradigm especially when they are to be playing one of the most significant role.

The information requirement of the public in rural and urban areas relates to their day to day activities like agriculture, fishing, education,

health-care, weather, loan facilities, land registration, fees related to various government services, etc. If the community is given access to their critical information requirements through public libraries, it will help them to save a lot of time as well as money.

Public libraries can play a much-needed role not only in bridging the digital divide but also in building a well-informed and literate society.

E M S CO-OPERATIVE LIBRARY

As a part of fulfilling the social obligations, Ernakulam District Co-Operative Bank took initiative to start a public library under co-operative sector in the year 1999. This significant step was a landmark in library history. Initially the library started with 100 members and 5000 books. But its growth was unimaginable. After three years the library grapi. becomes 2100 members and 20,000 books. These immense responses from the public gave the authorities motivation to expand library's activities.

Presently library holds 7,300 Members and 70,000 books. This library has grown as a center of knowledge in every aspect. Members of the library can enjoy reading books of their choice in the calm and quite surroundings provided by the library. Breaking the barriers of local area, researchers, scholars and students from distant places visit the library for referring rare, valuable and costly books.

The main aim of EMS Cooperative library and information centre is to develop reading habits among the public providing adequate materials and facilities.

SPECIAL FEATURES OF EMS CO-OPERATIVE LIBRARY

As the first and foremost public library under cooperative sector in Kerala, this information centre has unique features to publicize.

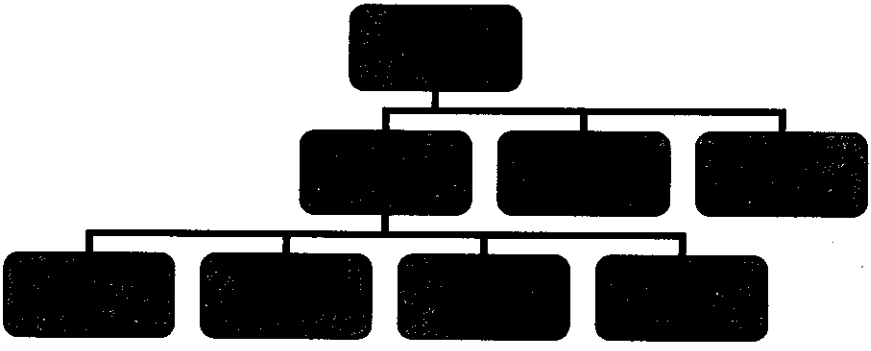
- Pioneer in the Co operative and Banking sector
- Fully computerized and barcoded library.
- Library, back dropped by a beautiful garden inducing an ambiance of learning and playing.
- Enviable collection of reference books and journals both national and international.
- Wide range of subjects catering to all types of readers.
- Luring children's titles.
- Vivid representation of carrier guidance, entrance, management section.
- Over 7300 members from throughout the country

- Tie-up with Developing Networks (DELNET) and American Information Resources Centres – India (AIRC) for information dissemination
- Conducts monthly programmes with various events and issues
- Online information facility through websites
- Personal collections of rare valuable books of (Late) Prof. M Krishnan Nair
- Art, cartoon corner
- Library for visually challenged which is the most eye-catching section with latest technologies.

Are the most important features to highlight.

LIBRARY RESOURCES

The library collection includes 70,000 titles. This include Malayalam 16000, Children's collection 13000, Reference books 2100 other titles 38900. The total magazines/Journals include above 200, popular dailies 15 which includes Malayalam and English, CD-ROMs 1300.



BOOKS

Library collection of reference books like Encyclopedia Britannica, Encyclopedia Americana, World book of encyclopedia, Oxford English Dictionary, World Atlas, specialized sections for Gandhian and EMS studies are available for reference. Students in various levels are utilizing the facilities provided by the library for their better prospects. The library has currently 70,000 books covering Medical, Engineering, Law, Computer, Science and Technology, History and Geography, Art and Literature, Religion, Philosophy, Education, Career development, Management, Co –operation and Banking , Women studies etc. The rare and complete paintings of Leonardo–da–Vinci, Michel Angelo Picasso, Vanghoh, Dali, M F Hussein, and Raja Ravi Varma are kept for

reference. Besides imported art books of immense value are also on issue to members.

A/c Reference Section, separate full-fledged sections for Malayalam and English Literature, huge collections of Management, Entrance, Education, Career Development and Co-operative titles are not seen elsewhere. Special area of Govt. publications & Kerala Legislative assembly papers are very useful tips to General public.

CHILDRENS SECTION

Childrens section is a unique specialty of the library. Stories, Poems, Short Novels, Adventures, Comics, Horrors, Life Sketches, Projects, Experiments, Learn About series, question banks for all classes and Special Children's Reference are their special attractions.

PERIODICALS

Indian/ Foreign Periodicals and Newspapers are available for reference. Over 100 Periodicals meet the users requirements touching through all most all areas. Our fabulous titles are Time Literary Supplement, Scientific American, New Scientist, Span, Harvard Business Review, National Geographic, Far Eastern Economic Review, The Economist, Newsweek, Time, Outlook Terragreen, Tehelka, Discover India, Inside Outside, Digit, PC Quest, Linux for You, Women's Era, Femina, Cine Blitz Bussiness Economy, Seminar, Economic and Political Weekly, Frontline, Sport star, CNN, Education Today, Electronics for You, Health, C.S.R. A.A.T, Auto India etc. Besides 20 popular dailies and all most all subsidize journals also included. Back issues of periodicals borrowing for members and valuable titles are kept for reference as bound volumes.

CDS AND AUDIO CASSETS

Library has 1000 CDs on various departments like Reference, Education, Report, Project, Computer, Electronics, Medical, Games and Movies. Main collections are Encyclopedia Britannica, Oxford English Dictionary, National Geographic Magazine (120 Yrs.), Medical Encyclopedia, New Way Things Work, World Book, World Bank, World Health Organization, Census of India and Karnataka Sangeetham (all Levels) etc. Library also maintained an Audio Cassettes division of their major events.

SPECIAL SERVICES FOR VISUALLY HANDICAPPED

The section for visually handicapped is designed to improve the lives of those whose eyesight is diminished to any degree and for any reason, including: diabetes, macular degeneration, glaucoma, cataracts, and retinitis pigmentosa. 'Library for the Blind', this is of the first one in south India. The library uses latest technology- based products

developed, manufactured, and marketed by Freedom Scientific that enable the blind to have complete access to information and computing. Freedom Scientific is a privately-held company. It has offices in Florida, California, and Switzerland and distributors in 56 countries. Freedom Scientific is the world's leader in technology-based solutions for people with visual impairments. In addition, Freedom Scientific is a leading developer of products specifically designed to assist persons with reading-related learning challenges. Freedom Scientifics' products help people stay active, remain independent, and live better.

EMS library is operational for providing services to the blind with the help of equipments like:

SARA's text reading machine



Freedom Scientific's SARA™ (Scanning and Reading Appliance) is an affordable and easy-to-use solution for those with low vision or who are blind or deaf-blind. The SARA enables the reading of a wide variety of printed material including books, documents, mail, newspapers, magazines, and much more. Using Optical Character Recognition (OCR) technology, the SARA works like a computer scanner that recognizes text, translates it into speech, then reads the text aloud. The SARA features 36 male and female voices and 35 major languages plus 16 dialects. Those with low vision will appreciate that they can attach the SARA to a monitor and produce colorful, large on-screen text that complements the reading voice

PRISMA C C T V



This is another noteworthy facility provided by E M S library for the benefit of partially blind or visually handicapped people. This equipment is attached to LCD or computer or TV so that the user can visualize the content on the screen in an enlarged mode.

JAWS (JOB ACCESS WITH SPEECH) TALKING SOFTWARE

JAWS for Windows is the overwhelming leader in screen readers, worldwide. The JAWS screen reader is a software application that provides access to a Windows based computer for individuals with low vision or blindness. JAWS (Job Access with Speech) for Windows works with PC to provide access to today's popular software applications and the Internet. JAWS' multilingual Eloquence speech synthesizer speaks through the computer's sound card, reading information and providing access to a wide range of informative, education and job-related applications.

MAGIC MAGNIFICATION SOFTWARE

This is another facility offered to blind people by the library. This particular software helps computer users who need low vision aids due to macular degeneration, retinitis pigmentosa, or other causes of low vision can take control of web and software application pages. No longer will you struggle with type too small to see and images with indecipherable details. MAGic screen magnification software not only increases the size of what we see on a monitor, but MAGic with Speech also speaks aloud screen contents. MAGic makes school research on the Web less challenging for those with vision loss. It smooths the way for work projects that involve report writing, spreadsheets, and working with common office-related software. MAGic even makes leisure Web browsing, letter writing, blogging, chatting, and other everyday activities that involve the computer more fun.

BRAILLE – AUDIO BOOKS

The library collection has Braille books which includes Oxford English Dictionary of 125 volumes and few other reading materials.

LIBRARY SERVICES

- **Internet, DELNET, Computer Games**

Internet services (High Speed Broadband Connection) over 8 computers meet the users requirements at a subsidized rate. Computer game centre is simply fabulous to children. Library is having DELNET (Developing Library Networks) & AIRC (American Information Resource Centre). Library cater all types of members sufficiently by their services like-Selective Dissemination of Information, Stocking of books & journals at their request, Supplying articles in demand etc

- **Indoor Games, Theatre**

Library maintained an indoor games section for small children, contains board games, puzzles, dolls, children's hut etc. Children's Theatre is the main attraction in the library. Dolby stereo sound, A/c and high resolution LCD gives the original effect to viewers. Movies for children are played on weekends in the theater.

- **Cafeteria**

Library prepared a mini snack center & cafeteria in the second floor of the library. Members can utilize this facility at nominal rate.

- **Garden Library**

About 2.5 acres park attached to the library provides a unique atmosphere for reading books of ones choice in a calm and quite setting. Huts in the garden also provides privacy and rustic atmosphere for reading. The garden library in every sense tempts the inner aspirations of love and melody of reading. The library has ushered in a new era of reading culture and is used by large sections of the public. Other attractions include badminton and cricket court, playground for children, walk way, swings and huts, fountains in ponds etc.

- **Extension services**

Library attract the readers by converting itself into a social , intellectual and cultural centre and for this purpose library organizes various extension service activities. Apart from all these as a public library EMS library also provides several extension services to the public. They are highlighted below

- Personality development course
- Seminar and debates on the topic of latest issues
- Talks by eminent persons.
- Painting and drawing classes for children
- Creative activities for children

EMS LIBRARY ON EXPANSION MODE

As a premier and the most leading public library under co-operative sector, this library has certain future plans for escalating its facilities and services to the public. EMS Library which has been functioning successfully since its inception, is all set to launch its second phase by constructing a ten storey complex adjacent to the existing building. The new facility will cater to all sections of the society with primary focus on women and kids. It will have a kids section, exclusively catering to children with all modern articles like audio books, computer games and the materials for enhancing the scientific knowledge of the kids.

The building will have a dedicated floor for women who wish to develop their talents. The women section will offer training on glass painting, pot

painting and fabric painting, which will help them to earn a moderate income through hobbies. The women will also benefit from the computer training programme the library plans to offer. The new library building will also have a new generation health club with all modern equipment.

The library authorities have taken initiative to digitize their library collection with their commitment to freedom of access to information and promotion of life-long learning are central to bridging the digital divide where all services are provided to all regardless of age, race or language.

CONCLUSION

The policy makers of Kerala state and rural and urban development employees need to review their rusted ideas on public libraries and recognize the more central role of the public libraries in bridging the digital divide in Kerala. Meanwhile, library professionals need to come out from their shell to drive the public library development with a high spirit and enthusiasm. Libraries and information centers have a special role in providing information to all in order to reduce the gap between those who have the facilities to access digital information and those who do not. The state needs to improve the infrastructure of public libraries and link them with community information centres.

In Kerala, Grandhasala Sangham plays a leading role in the literacy programs and as such the EMS library as a role model public library with high vision and mission can take the responsibility of IT literacy in the state. In the perspective of the digital divide, IT literacy is very important to allow access to digital information.

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Knowledge Management in Academic Libraries

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ABSTRACT

The present paper introduces concept of knowledge, knowledge management and academic libraries. Describes definitions, need, principles, basic functions, benefits, process and technologies/tools of knowledge management. Challenges and role of knowledge management are also mentioned. Concludes with the roles of librarians, skills and competencies required for knowledge management.

Keywords: knowledge, knowledge management, academic libraries, Principles, basic functions, challenges, information manager, skills, competencies.

INTRODUCTION

Knowledge

Knowledge is derived from information but it is richer and more meaningful than information. It includes familiarity, awareness and understanding gained through experience or study, and results from making comparisons, identifying consequences and making connections. Knowledge is justified true belief, understanding based on experience. Knowledge is experience or information that can be communicated or shared and capacity for effective action. Knowledge is of two kinds i.e. tacit knowledge is personal and it is stored in heads of people and explicit knowledge that can be codified and transmitted in systematic and formal language viz documents, databases, webs, e-mails, charts etc.

Knowledge Management

Knowledge management is knowledge process management i.e. the management of knowledge production, knowledge integration, the knowledge life cycle and their immediate outcomes. Knowledge management often encompasses identifying and mapping intellectual

assets within the organisation, generating new knowledge for competitive advantage within the organisation making vast amounts of corporate information accessible, sharing of best practices and technology. Intranets knowledge management includes management strategies, methods, technology and know-how to achieve gains in human performance and competitiveness. Knowledge management involves efficiency connecting those who know with those who need to know and converting personal knowledge into organisational knowledge.

Academic Libraries

Academic libraries are attached with the educational institutions i.e. schools, colleges and universities. The academic libraries take care of the information needs of students, teachers and research scholars. The changing environment of academic life demands new competencies in academic librarians. As a result, the knowledge and expertise of academic librarian need to be seen as the library's greatest assets.

DEFINTIONS OF KNOWLEDGE MANAGEMENT

Many scholars and experts gave various definitions of knowledge managements. Some of the important definitions of knowledge management are as follows:

a) ***MALHOTRA (Y)*** defines "knowledge management caters to the critical issues of organisational adaptation, survival and competence in the face of increasingly discontinuous environmental change. It embodies organisational processes that seek synergistic combination of data and information processing capacity of information technologies, and creative and innovative capacity of human beings"

(b) ***KNAPP (Ellen)*** defines "knowledge management is the art of transforming information and intellectual assets into enduring value of an organisation's client and its people"

University of Kentucky defines "A field of study, knowledge management is concerned with the invention, improvement, integration, usage, administration, evaluation, and impacts of such techniques."

WENIG (R Gregory) defines "Knowledge management consists of activities focused on the organisation gaining knowledge from its own experience and from the experience of others, and on the judicious application of that knowledge to fulfil the mission of the organisation."

MURRAY (Philip C) defines "knowledge management is strategy that turns an organisation's intellectual assets both recorded information and talents of its members into greater productivity, new value and increased

competitiveness. It teaches corporations from managers to employees, how to produce and optimize skills as a collective entity."

From the above definitions we can say that knowledge management is a management discipline that seeks to enhance organisational knowledge processing. Knowledge management is also human activity that is part of interaction constituting the knowledge management process of an agent or collective.

NEED FOR KNOWLEDGE MANAGEMENT

There are various needs for knowledge management. Some of the important needs for knowledge management are as follows:

(a) Any work is information and knowledge based; (b) Organisations compete on the basis of knowledge; (c) Lack of time to experience and acquire knowledge; (d) Need to manage increasing complicity; (e) Need for lifelong learning in an envitable reality; (f) To remain aligned with the dynamically changing needs of environments and organisations; (g) Best practices of yesterday may not be taken granted as best practise of today or tomorrow; (h) Knowledge management lets you lead change so change does not lead you; (i) Only the knowledge survive; (j) Knowledge can drive decision support like no other; (k) Knowledge requires sharing; (l) Tacit Knowledge is mobile; (m) Accelerating rate of innovations that needed to be assimilated at an even faster rate; and (n) Increasing mobility among employees leading to loss of knowledge.

PRINCIPLES OF KNOWLEDGE MANAGEMENT

DAVENPORT (Thomas H) highlighted the following principles of knowledge management:

(i) It is expensive as it requires knowledge manager; (ii) It improves knowledge work process; (iii) knowledge management never ends; (iv) It is about people; (v) It is orderly and goal oriented and uses only the information that is most meaningful practical and purposeful; (vi) It is value added and libraries can exchange of ideas by bringing experts from the field to advise and educate librarians on recent trends and developments; (vii) It is visionary. the vision generate enthusiasm and motivates the library staff to work together toward reaching common goals; (viii) It is complementary. It can be integrated with other initiatives such total quality management; (ix) Knowledge access is only the beginning; and (x) Effective management of knowledge requires hybrid solutions of people and technology.

BASIC FUNCTIONS OF KNOWLEDGE MANAGEMENT

Main objective of knowledge management is right information to right user at the right movement. Knowledge management is an organisational strategies which help the clients to level deeper into their own databases, methods of working organisational culture, people strategies, organisation goals etc. Four basic functions of knowledge managements are as follows:

(i) ***Externalization***: It is a process of capturing knowledge in depository and organising it according to classification framework. It uses technologies to capture knowledge and store it online e.g. imaging systems and databases.

(ii) ***Internalization:*** It is a process of extracting knowledge from external repositories and filtering it to identify what is relevant to knowledge seeker.

(iii) ***Intermediation:*** It matches knowledge seeker with the best source of knowledge available by tracking the experiences and interests of individuals. The intermediation can link people who need knowledge with the people who apprised to have knowledge in that area.

(iv) ***Cognition:*** It is application of knowledge that has been exchanged through the proceeding three functions and ultimate goal of knowledge management.

TECHNOLOGIES/TOOLS OF KNOWLEDGE MANAGEMENT

Some technologies/tools which associated with knowledge management are as follows:

(i) ***Internet:*** It is a network of computers connected to each other that has enabled users to access a wide range of data including text, video, audio, graphics, images, database, maps etc. The users can search and select useful databases websites and knowledge source from the internet.

(ii) **Data Warehousing**: Data warehouses are databases that provide users clean, consistent and relevant data. Clean refers to correct data, consistency results in one version of data and relevant implies that data is organised so that can be used to answer questions.

(iii) **Data Mining:** Data mining is a technology that runs hand to hand with hand warehousing. While data warehousing merely helps to aggregate all the data with the library it is data mining which helps to find patterns and co- relates within all this data, leading to knowledge discovery.

(iv) ***Expert Systems:*** The expert system technology helps to translate knowledge in people's heads into a set of rules that could be stored within expert system too. Information technologies widen the scope of knowledge acquisition as

it rises the knowledge acquiring speed and reduces the knowledge acquisition costs.

(v) ***Information Retrieval***: An information retrieval system helps the users to find documents that can best satisfy their information needs. The tools of information retrieval are networking of computers, web publishing, E- mails, internet search etc.

(vi) ***Document Management:*** Document management tools use multiple technologies to provide a wide range of functionality with respect of creation, maintenance and retrieval of documents. Most of tools provide a combination of functions like document creation, indexing search and retrieval.

(vii) ***Collaboration***: Knowledge management is all about bringing people together to tap their expertise and judgement. Collaboration uses different technologies like messaging, chats, discussion groups, audio conferencing, video conferencing etc. Collaboration in terms of good network infrastructure is greater boon to the libraries.

(viii) ***Database Management System***: Today many libraries manage their knowledge sources with groupware. Groupware is a software application used to create and organise databases that are distributed and shared throughout an entire institution. Database management system become important. The library application software is a simply software which permits an organisation to send and receive data from the database management system.

KNOWLEDGE MANAGEMENT PROCESSES

GAGLAN (P) proposed a set of knowledge management processes as follows:

(i) Generating new knowledge; (ii) Accessing knowledge from external sources; (iii) Representing knowledge in documents, databases and software's etc.; (iv) Embedding knowledge in process, products or services; (v) Transferring existing knowledge around and organisation; (vi) Using accessible knowledge in decision making; (vii) Facilitating knowledge growth through culture and incentives; and (vii) Measuring the value of knowledge assets and the impact of knowledge management.

Besides the above some other important processes listed below:

(i) Create knowledge repositories; (ii) Enhance knowledge environments; (iii) Improve knowledge access; and (iv) Manage knowledge as an asset.

BENEFITS OF KNOWLEDGE MANAGEMENT IN LIBRARIES

The following benefits of knowledge management in libraries may be observed:

(a) Best selection, collection, processing, storage, retrieval and dissemination of information in the area of the parent organisation;
(b) Promotion of scientific research in the field of parent organisation;
(c) Improve the efficiency of the library in terms of saving of time and enhancing overall quality of library service;
(d) Enhance responsiveness and communicative capabilities;
(e) Strengthening knowledge flow among libraries in order to share and enhancing the resources;
(f) Improve status credibility of the library as well as of the organisation;
(g) Facilitate of interdisciplinary research;
(h) Improve speed of curriculum revision and updating;
(i) Improve service capability of faculty and staff;
(j) Improve effectiveness and efficiency of administrative services;
(k) Improve responsive and communication capabilities;
(l) Foster innovation by encouraging the free flow of ideas;
(m) Improve users service by streamlining response time;
(n) Enhance employee retention rates by recognizing the value of employee's knowledge and rewarding them for it; and
(o) Streamline operations and reduce costs by eliminating redundant of unnecessary processes.

CHALLENGES OF KNOWLEDGE MANAGEMENT

There are various challenges of knowledge management but main challenges are as follows:

(i) Information Overload

Many libraries have accepted the benefits of capturing and sharing their information and knowledge. They have implemented new procedures new systems and new technologies. New knowledge acquiring system are often not accompanied by clear policies as to what to capture and when or how to update. There is no evaluation of the acquired information and knowledge.

(ii) *Staff Incentives For knowledge Sharing*

A common complaint from the busy employees is that they have no time for knowledge sharing. They see knowledge sharing as an additional task in an already hectic schedule rather than an inherent part of their activities and practices. Job description have to be redesignated to reflect that effective knowledge use and collection are an instrict part of the job. Staff within the library must be given an incentive for knowledge sharing.

(III) Failure To Marketing Knowledge

Marketing knowledge involves looking at what a library has in-house and considering whether changed use of technology, better information structures, new corporate culture or changed user needs will enable that information and knowledge to be marketable. It requires examination of internal expertise and shared knowledge to discover whether it can be repackaged and sold to existing and potential users in the form of product or service.

(iv) *Multiple Format of Information*

The rapid growth of information and communication technologies changed the way academic libraries operate today. Academic library acquires collections comprised almost entirely of printed and non-printed materials i.e. text books, general books, reference books, journals, periodicals, E- books and E- journals. Information technologies such as computers, multimedia and CD-ROMs, are bringing, unprecedented changes in providing services and resources to the educational community. The web had a tremendous effect on the growth of information and speed of transmission.

Another challenge facing academic libraries in the networked online environment to exploit all forms of digital and telecommunication technologies and find new ways and means to provide feasible forms of collection; services and access to library materials.

(v)*Changing Users Needs*

As academic institutional information's demands are changing. Due to societal and technological developments, traditional teaching changes increasingly in creating learning environments. This places greater demands on the library, which is increasingly being used for group work.

Academic libraries have to provide information services for users according to changing academic environment. The challenges require academic libraries to offer user friendly facilities, analyze the changing user needs and give support to users in new academic environments.

(vi) *Organisational Structure*

As a result of rapid environmental changes, academic libraries need to rethink their organizational structures to provide quality service to the educational community.

There is a need to reshape the structure of academic libraries so that they will be able to improve the services they provide to both today's and tomorrow's users. Like other organizations academic libraries need to reshape their structures to serve better their users.

(vii) ***Changing Role Of Librarians***

In an age of great change in information formats, delivery models and technologies, an important new role emerges for the academic librarian. One of the major roles of academic librarians is that of knowledge managers. They need to understand the information and knowledge needs of users. Academic librarians should extend their information management roles and enhance their knowledge management competencies.

(viii) ***Other Challenges***

While there is general acceptance of the concept of knowledge management, the knowledge aware library is not necessarily experiencing clear commercial benefits or tangible results as a result of this acceptance. Those libraries with a knowledge management programme are faring better than those without, but there are still many challenges facing the knowledge aware libraries.

ROLE OF KNOWLEDGE MANAGEMENT IN LIBRARIES

The role of knowledge management in libraries has become more vital alongwith the development of knowledge economy. It is a new management mode with unique characteristics that distinguish it from conventional management. The major components of knowledge management in libraries are as follows:

(a) ***Human Resource Management***

The most important resource in knowledge economy system is the talents of the personnels. The library should attach importance to vocational training and life long education of library staff to raise their scientific knowledge level and ability of a innovative knowledge. An all round improvement of library staff is quality and positioning of human value will become, important objectives of knowledge management in libraries.

(b) ***KONWLEDGE INNOVATION***

Knowledge innovation in libraries refers to the management of the production, diffusion and transfer of knowledge as well as of the network system constructed by institutions and organizations. It include following three aspects:

(i) Technical innovation management of knowledge is to enrich and enlarge theoretical and research field of library and information science.

(ii) Technical innovation management is to manage the network system so that libraries build up technical facilities to support knowledge management, and

(iii) Organisational innovation management is to create a set of effective organisational management system adaptable to the

requirements in the electronic and digital library era to support and strengthen knowledge management activities.

(c) *INFORAMTION TECHNOLGY*

Knowledge acquisition is the study point of knowledge management in libraries. The application of information technology enlarges the scope of knowledge acquisition, raises knowledge acquisition speed and reduces the knowledge acquisition cost. The knowledge acquired must be accumulated and converged in knowledge warehouses of the libraries. Information technology is assemblage of communication technology computer technology and information science. Information science is more vital as it is fundamental to any form of communication.

(d) *KNOWLEDGE DISSEMINATION*

Knowledge creators do not have much time and energy to look for knowledge users. Libraries play part of acquiring knowledge that already exits and disseminate knowledge using diverse media and channels are as follows:

(i) Uninterruptedly strengthening the creation of libraries' own documents resources and deepening the development of document information resources;

(ii) Continuously raising the quality of libraries' stairs and strengthening continuous engineering education of working stalls;

(iii) Giving full play to the special role of expert system in knowledge dissemination; and

(iv) Making a comprehensive utilization of all media to ensure security of operation of networks by preventing online criminal activities and online dissemination of inappropriate information.

(e) *OTHER ROLES*

Other roles played by knowledge management are as follows:

(i) Puts technology into perspective and promote innovation;

(ii) Enhances users' and organisational ability to think to learn from innovations and experiences and to implement decisions;

(iii) Helps to take quick decisions in organisation meetings;

(iv) Assists individuals to access and managing knowledge repositories through computerized communication networks and documents;

(v) Develops knowledge sharing culture in the organisation;

(vi) Breaks communication barriers within the organisation;

(vii) Assists to develop the frame work of knowledge management system through sharing information quickly across the geographically dispersed units; and

(viii) Increases productivity and establishes organisation as leading one by providing knowledge more easily.

ROLE OF LIBRARIANS IN KNOWLEDGE MANGEMENT

(A) As Information Manager

Librarian's core duties now include information packaging and information customization.

(i) ***Dissemination Knowledge Management:*** The libraries use diverse media and channels to disseminate new knowledge. Finding existing knowledge, understanding requirement, searching among multiple sources and disseminating it to proper users;

(ii) ***Recognize Knowledge and Information as an Important Asset:*** Methods need to be developed to values and assess these assets and their effective management and growth as valued assets. In other words identify current knowledge and information resources their usages, importance, cost and values classify information and knowledge by its key attributes;

(iii) ***Apply Computer Technology to Augment Knowledge Processing***: Develop appropriate technological system, continual advances in technology increase the opportunities available for competitive advantage through effective management;

(iv) ***Exploit Technology Convergence:*** Traditional hierarchical structures and rules must be modified to allow innovation to flourish. Exploit technology convergence through open networking using facilities such World Wide Web not just for external information dissemination but sharing dissemination internally;

(v) ***Develop Collaborative Sharing Culture***: Innovation needs sharing collaborative culture that required experimentation and learning. Raw information needs interpretation, discussing and analyzing teams of experts offering different perspectives;

(vi) ***Identify Customer As Capital:*** Customer knowledge is now being recognized as key knowledge. It not assists about anticipated needs but serves present requirements. For continuous improvement and innovation, customers recognised as intellectual capital in the organisation;

(vii) ***Ensure Networking:*** Network plays an important role in shaping and promoting knowledge among organisations. It also provides opportunities for shared learning, knowledge transfer and information exchange. It connects knowledge seeker to knowledge providers. Develop network environment in the organisation to share expertise and ideas. He should ensure that highly relevant knowledge stored in network being

linked and used to key decisions and objectives of the organisation;

(viii) ***Collaborate Knowledge Management:*** Knowledge manager should learn more by joining knowledge linking programmes through collaboration that assist to bring new knowledge into their knowledge management system. Knowledge manager must attract and motivate talented persons to the team to enthuse the knowledge workers team to achieve the desired goals;

(ix) ***Inculcate The Library Culture:*** Knowledge manager will inject new blood into the library culture. The main contents include trust, open exchange, studying, sharing and developing knowledge operation mechanism of librarians, enjoying knowledge management process. To make full use of knowledge it is necessary to foster an new type of library culture suitable to requirements;

(x) The librarian to reach out to the community by targeting anticipating and meeting their information requirements. Continuous review evaluation and revision of packaged information would be important task for librarians to perform and to remain relevant to their audience;

(xi) Often knowing where to obtain information is the key being able to give users the information they need. This involves the active sourcing and extensive reading on the part of the librarians; and

(xii) The librarian is expected to play the following roles in knowledge management.

(B) As A Teacher

User education, information literacy packages and class visits now assume a core responsibility on the part of librarians to educate readers how to search for information, how to conduct research, how to use electronic databases, how to use internet to obtain required information and how to evaluate information obtained from print and non-print formats.

Librarian role have evolved to teach the users of information to acquire the basic reference skills necessary to conduct research of own with additional guidance from staff.

SKILLS AND COMPETENCIES REQUIRED FOR KNOWLEDGE MANAGEMENT

Some of the skills needed by the information professionals in a knowledge based environment are as follows:

(i) Information literacy, i.e. knowing how to use the appropriate technology to capture, catalogue and disseminate information and knowledge to users;
(ii) Knowing how to translate knowledge into a centralised database for employees of the library to access;
(iii) A sharp and analytical mind;
(iv) Innovative and enquiring, enables knowledge creation, flow and communication within the library staff and users;
(v) Providing services to users community;
(vi) Sharing the information and understanding users needs.
(vii) Theoretical and practical dependence in designing and implementing information systems.
(viii) Analyzing documents, classifying and storing them for easy retrieval.
(ix) Knowledge of current advances in information systems and technologies and their application in libraries.
(x) Building the index using standard vocabulary;
(xi) Ability to effectively teach end-users, individually and in groups.

It is important to encourage professional to constantly update their skills and competencies in changing environment.

CONCLUSION

There is an investment that needs to be made to start and maintain knowledge management programs. The results of implementing a successful knowledge management program can far out weigh these costs. Information professionals have the necessary skills to succeed in knowledge managements. Continued communications of the successes of knowledge management will help to prove the program value, knowledge management has be come a powerful tool for promoting innovation and realizing reengineering in the changing information environment. Knowledge management should be evolution of good management practices sensibly and positively applied.

Knowledge management is a strategic process, since it is goal oriented, involves planning, implementation and outcome in the form of required knowledge for organisation activities. Knowledge management system require well balanced approach between human resources and information technological tools. Since knowledge management is not a technological process instead it plays supportive role in knowledge management process.

Knowledge management enhances the organization's ability and capacity. It can be used in libraries to achieve organizational goals. It is

necessary to restructure the traditional functions of libraries and implement the principles of knowledge management.

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Knowledge Management: Success Mantras

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ABSTRACT

KM is as an enterprise-wide goal, many organization find success if they start initiative in one department and then extend the practices throughout other parts of the organization. Often KM practices relating to service and support can be defined as knowledge-powered problem resolution - using a knowledge base, knowledge sharing, collaboration and knowledge reuse to efficiently solve customer questions. This paper will outline those practices that help ensure a successful KM initiative in service oriented organization.

INTRODUCTION

1 Knowledge Management (KM)

Knowledge Management (KM) can mean different things to an organization depending upon the nature of the activity in which the organization is involved. It is a practice or discipline that involves people, processes and technology. It is said that if KM is implemented correctly with cultural buy-in from users and management, plus clearly defined goals, it can improve the productivity and efficiency of an entire organization.

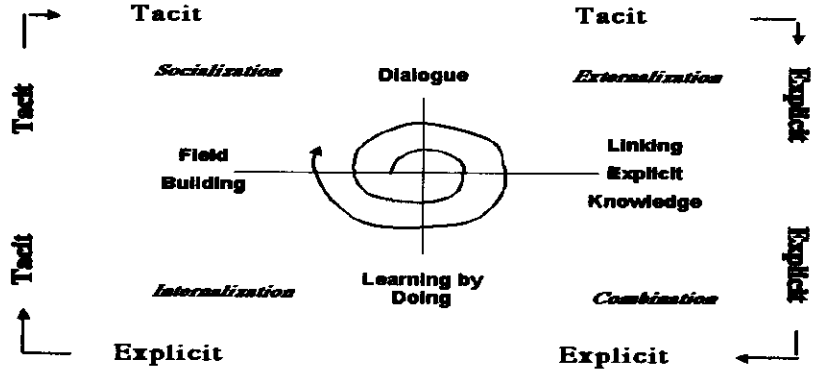
Knowledge Management (KM) as defined by Gartner Group Inc., (Oct 1996) as "a discipline that promotes the integrated approach **for** identifying, managing and sharing of all of an expertise's information assets".

A KM journal, the 'Knowledge Praxis', has defined knowledge management as a business activity with two primary aspects, **First,** treating the knowledge component of business activities as an explicit

concern of business reflected in strategy, policy, and practice at all levels of the organization. **Second**, making a direct connection between an organisation's intellectual assets-both explicit and tacit-and positive business results.

It is a practice of harnessing and exploiting intellectual capital to gain competitive advantage and customer commitment through efficiency, innovation and faster and more effective decision making

Knowledge Spiral



In Nonaka and Takeuchi, The Knowledge-Creating Company 1995, page 71

There is no Universal Definition of Knowledge Management, The KM is the end result of intensified research of scientists to contrive the crushing growth of information in an effective way with the help of the modern technological devices and is thus, an obligatory path in the highly competitive service environment including business environment that require more responsiveness, innovativeness, competitiveness and efficiency in work profile.

2 KM and the Economy

The practice of knowledge management can be useful during tough economic times and in times of rapid growth. When an organization downsizes, critical knowledge and intellectual capital are lost. When business picks up it often picks up quickly. You can't hire and train fast enough to maintain a satisfactory level of performance using traditional methods. Even if you could, at some point it becomes cost-prohibitive to keep hiring. You can't hire your way out of growth. Instead, you need a more efficient way to deal with growth. Knowledge Management and a system for capturing and reusing knowledge can help businesses deal with the economic fluctuations

3 Knowledge Management for Service and Support

A successful knowledge management initiative in a service organization

can reduce agent training time and speed new employee ramp up. Knowledge-powered problem resolution enables agents to become more confident and competent sooner than they otherwise would without a KM practice. By having access to a knowledge base, customer service employee can get answers to common questions without having to constantly ask other more experienced employees. Customers and end-users benefit from faster problem resolution, and experienced agents can focus on solving more challenging problems. Customers and end-users also benefit when they have direct access to a knowledge base to solve their own issues without ever contacting an employee. A growing number of people now prefer self-service to live interaction, at least for certain problem types. For some people, self-service fits perfectly into their lifestyle. They are in a hurry and they need a specific piece of information and that's all they want.

Say, for example, in a corporate environment, an employee needs to know if there is a Windows Vista driver for a USB Zip drive. She doesn't want to wait in a queue. She doesn't want to talk to an agent. She just wants to know if there is a driver available and where to find it. In this case, self-service can be superior to agent- assisted service. Knowledge Management is an evolving discipline that can be affected by new technologies and best practices, but there are some things that we do know for sure. There is a systematic approach to successfully implementing knowledge management and if you analyze what you are trying to accomplish, map out a strategy, garner support from the organization and have a way to measure it, then you are much more likely to be successful.

SUCCESS MANTRAS:

We have tried to list 10 **Success Mantras** that will serve as a primer for successful KM practice initiative

Mantra 1: Knowledge Management is a discipline

It is said that Knowledge Management(KM) is a technology or software solution but it is much more than that. In fact knowledge management is a discipline. Obviously, you have to have a good piece of software or a good system to capture knowledge – but that's not the whole equation. Underestimating what it takes just to capture the knowledge correctly is a big risk, as is underestimating the integration task into your already complex environment. There are some providers of pre-packaged knowledge out there, but our experience is that while they can be useful to the help desk they are not relevant to customer service centers which have business-specific content needs. In either case, you must ensure you have the adequate resources to create and maintain the content you promise. Creating content is not a one-time project. Also, over time the content must be updated and supplemented as new products or services

are supported. Empowering employees to add new content as they are discovered is key to maintaining a robust system.

Mantra 2: One champion is not enough

To be successful, your project must have several champions within the organization. These are individuals that believe in the project, enthusiastically advocate it and have the clout to "make things happen." Projects that lack a champion generally don't get off the ground. Those with only one champion are also at serious risk.

Losing your champion can spell disaster for your project. This is a real problem for knowledge management projects, due to their continuous duration. If the project champion transfers, retires or leaves the company, the project often loses its momentum and the project may falter as someone else takes it over.

What we would like to suggest that KM initiative in new organization ***requires dual-sponsorship: one at the operational level and one at the executive level.*** So if an operations manager decides the company really needs knowledge management, that manager should find somebody on the executive staff that will agree to support the vision. By having that dual track of vision the project is more likely to succeed.

Mantra 3: Cultural change isn't automatic

Buy-in is needed at all levels, and this may require cultural change. The people that are going to use the tools have to be part of the design unless you plan on strong-arming them (and that doesn't work very well). Don't make this management decision in a vacuum. Include some people from the various groups that would directly or indirectly use the system.

Sometimes there is a fear that knowledge management will be used to replace people. If your staff thinks that is what you are trying to do, then you really need to address that head-on. If that is not your intention, you should convince your team that current head count reduction is not the goal. Therefore, you need to look for and plan the motivation for each party. After all, you are asking people to shift from a system where being a tower of knowledge is rewarded to a system where they share their expertise with everybody on the team.

Each party will have a unique motivation to embrace knowledge management. For example, in a technical support environment, a frontline tech will have a different motivational schema than a 3rd level technician. The frontline tech is not going to have to ask the 2nd line tech as many questions, and can resolve more problems faster. The 2nd level tech is not going to get as many of the common questions. Level 3 researchers won't have to start at ground zero when handed a problem by level 2, because they know that all the intermediate steps have been

covered. So as you look across the organization everybody has a different interest and you have to protect all of them.

Failing to see how knowledge management is going to fit into the rest of the organization is a mistake. You must invest the time and energy to understand the culture, identify motivations and ensure change happens where needed.

Mantra 4: Create a change management plan

In case employees are not already sharing information, you will need a change management plan because you are asking people to do their jobs differently. The change management plan specifies how you will gain acceptance of knowledge management within the organization. Let's say you are a call center manager and you measure your employees' performance by call handle time and number of cases closed. Now you are going to be asking them to use a knowledge base on every call or e-mail interaction – thus asking them to change the way they perform their job on a daily basis.

Also, if you don't make changes to their performance reviews and compensation, there may be friction because you're asking them to do one thing but you are judging them by another set of rules. As part of the overall change management plan you need to update job descriptions, feedback sessions and performance reviews to reflect the new workflow. Neglecting to make these changes may foster acceptance issues with your team members.

Mantra 5: Stay strategic

Knowledge management is a strategic endeavor, since with KM you are never really done; you initiate it and you build it and then its online and you maintain it. In our practice we look for our clients to have a strategic goal for the project rather than a tactical goal. If you are looking to shorten handle time that's a tactical motivation and you're not as likely to be willing to go through the steps that a successful enterprise rollout would take. But if it is a strategic initiative, especially something that is top-down motivated (for instance improving customer service or improving employee satisfaction) then there is a better value statement involved and you are not relying on changing one metric. So you might see improvement in individual metrics like handle time and resolution rates but their value is limited compared to the return from becoming a collaborative knowledge sharing organization.

To get going, decide what goals you are trying to accomplish and why. Then try to identify a solution and methodology that will help you attain those goals in your environment. Sometimes people within an organization may say that a KM initiative is nice-to-have, but an economic downturn might slow the process down or defer it - thus being counterproductive when resources are scarce. But I think it's

counterproductive to consider KM a nice-to-have because the rewards are equally beneficial during both a downturn and the inevitable upturn. If you wait until the upturn then you will be forced to play catch up as your call volumes increase and your e-mail volume doubles; that's not the time to introduce a knowledge-powered system or build a knowledge base. It's not necessary to hire more employees if you have resources that are not 100% utilized or if you encourage your agents to contribute knowledge during their daily workflow.

Mantra 6: Pick a topic, go in-depth, and keep it current

I advise that you pick one area that needs improvement or has limited resources, and then build a robust knowledge base for that subject matter. Use that experience to learn about implementing knowledge in your organization; do one service center or one product group and learn from there. It is much better to be comprehensive for a narrow topic than fail to get enough depth. Sometimes an enterprise initiative is needed right away, and it can be done successfully, but it can involve a larger resource commitment to do a full-scale project all at once. It is noteworthy to mention that, the depth of your knowledge base truly depends upon your customers' needs.

Today's systems should enable agents to contribute new knowledge during their natural workflow. This is critical to ensure that solutions that are not currently in the system can be quickly added, once the resolution has been determined. It's also important to remember that regular and timely maintenance of the knowledge base is key to success It is recommended that a mechanism should be build that identifies gaps in content (information sought but not found), and a process for filling those gaps. It is particularly critical since if a people repeatedly fail to find what they are looking for they will stop using the system.

Mantra 7: Don't get hung up on the limitations

Certain types of knowledge are very well suited to quickly harvesting into a knowledge base. Company processes or technical procedures are well suited for knowledge management. By populating a knowledge base with this type of information and making it available to employees and customers, an organization can shorten or even avoid many calls. Organizations can also use a KM system to access existing unstructured sources of information that may already exist on a corporate network, intranet or within an existing call center or help desk system. It's important to note that experienced agents can certainly benefit from access to both structured knowledge and unstructured information because they're more likely to be able to pinpoint a solution within an unstructured document. However, level 1 agents or end-users accessing the knowledge base through self-service, may not find these sources of unstructured information helpful because they don't have the expertise to decipher the information quickly.

In addition to sources of knowledge, the specific type of information is also important to consider. The craftsmanship or expertise that a true expert has is much more difficult to capture. A master craftsman has a huge body of knowledge. They tend to "chunk" their knowledge and can't tell you the steps they use when they make a decision in their field; they just do it. Much like tying your shoe, you do it everyday but when you have to explain it its tough because you have internalized the process. I think that is where the breakdown is for harvesting expertise. I think a KM initiative could be somewhat limited because of the nature of complex knowledge, and thankfully we will always need human expertise. However, when it comes to a successful initiative, it's important to first determine what knowledge can be easily added to the system and then provide agents or a knowledge manager with the tools to add this step-by-step complex information to the system, ensuring that even difficult questions can be answered accurately.

Mantra 8: Set expectations or risk extinction

A big pitfall is the failure of knowledge management proponents in helping executive management set appropriate expectations. Customers, employees and management alike must know what they are going to get out of knowledge management, what it will take to get those results and how success will be measured. Measurement is where most organizations fail because they are doing things that were not measured before. So a year from now, you've built this thing, it's up and running and everyone loves it and your boss says "where's my return?" If you don't have a measurement system in place then you will have a hard time answering his or her question – especially for the new metrics that didn't exist before. You probably measured handle time, abandon rates, and similar operational metrics. But you may not be measuring call avoidance or knowledge usage, which affects ultimately the ability to measure resolution rates.

In addition to setting management expectations you have to set customer and end-user expectations. For example, if you are going to provide customers with Web self-service for one specific product then you must include the known problems that they are going to encounter in the knowledge base. In that situation you are better off to set their expectations that the knowledge base covers only that product and no other. Customers pose the same extinction risk that your employees do. If they visit the site a few times and they can't find an accurate or appropriate answer they will probably not return again.

Mantra 9: Integrate KM into existing systems

Typically, organizations that are implementing knowledge management already have an established data center, so they are not only building a knowledge base – they must also integrate it into their

existing environment – their call tracking system, IVR system, e-mail, remote diagnostics and other support systems.

When selecting a KM system, consider systems that have open architectures and proven integrations into existing call center and help desk tools to ensure a successful implementation. Also, processes will be affected, requiring change to reporting and measurement systems as well. Integrate reporting capabilities where possible to best understand how the combined systems are affecting the effectiveness of your support operations.

Mantra 10: Educate your self-service users

Once KM plan is created, determined the critical knowledge to include, initiated a plan to garner cultural acceptance, trained your agents and pinpointed key sources of knowledge – finally you need to educate your self-service users on how to find and access support information online to ensure a satisfying experience.

There are many ways to "push" your self-service capabilities out to your end-user audience. Traditional marketing techniques should be employed to promote this valuable service, such as e-mail, online newsletters or direct mail. Encourage users to visit your online support site by making it easy find and access the knowledge base. Be sure to include the site URL and directions for obtaining a login, if needed, in your marketing communications.

Another method is to encourage your agents to end support calls by informing the user of the support site. "Thanks for calling today, I'm glad that I could help you solve your problem. By the way, we now have a Web self-service site if you'd like to search the knowledge base. You can find it at www.ABC-Support.com and you can obtain a login by clicking the request login button on that page."

Finally, make sure your Internet or intranet site includes an easy-to-find link to your Web self-service site. A twist on the old saying, "If they can't find it, they won't come." So make it easy to find, easy to access and easy to use.

CONCLUSION

We think it is inevitable that knowledge management will have a high adoption rate in the next few years. Over time to remain competitive it will be essential to be "knowledge-enabled." Just a few years ago internet was not a common method for seeking information; now it has become one of the important medium to do so.

We can summarize KM with a quote from Gartner, Inc. – "Those enterprises that include KM processes as part of their customer

relationship management initiatives have a higher probability of success than those that don't."

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R F I D: Thriving 'Smart Logistics'

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ABSTRACT

RFID (Radio Frequency Identification) technology provide complete coverage, visibility and theft control over every aspect of logistics network and security of books & other reading materials. It strikes potential bottom line benefits by optimizing logistics performance through tracking shipments with accuracy, ensuring timely delivery and safety and enhanced utilization of library assets.

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RFID: A System for Library & Information Centre

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ABSTRACT

Radio frequency identification (RFID) technology, a surveillance system that promises to relieve repetitive strain injury, and improving safety, security, productivity, accuracy and convenience for communities working in various sectors. This Dedicated short-range communication (DSRC) system has been used in library for multiple purposes; such as automatic identification, tracking and management of material flow. It has also provided an additional advantage to Bar-code technology. In this article authors have presented in details about the genesis, overview and technology associated with implementation of RFID technologies in library application. Also author have narrated major standards and components of RFID system, which introduces the ways for both staffs and user to get advantage of RFID in the sense of cost-effectiveness, safety and security.

Keywords: Radio-frequency identification, Tags, RFID reader, security, Surveillance system, AIDC, Inventory Management.

INTRODUCTION

Radio frequency identification (RFID) a flexible technology was predicted to be one of the most convenient and well-suited automatic identification surveillance systems since 1980s. This system has gained popularity in recent past. The major driving force behind the rapid deployment of RFID technology is its commercial revolution, which enables items in transit through production system, warehouse, supply chain, access control, identification, material flow, tracked and so on. This new technology is quite inevitable to library, both for financial and human reasons. In this country, library security has always been a key

issue; such as material security, personal safety, personals comfort, financial liability, legal issues and problem patrons. The introduction of RFID technology brings notably a solution to minimize such problem. This system is claimed to be one of the major time saving automatic identification and data capture (AIDC) technique, which replace barcode and EM system in recent year. To a library, RFID is an item tagging technology with profound societal implications that collects, uses, stores and broadcast data for providing a safe hand and cost effective solution to the above-mentioned key issues facing most libraries these day.

RFID

RFID is an acronym for radio frequency identification. Briefly the RF stand for "radio-frequency" and ID means "identifier" that allows an item, for instance a library book, to be identified, accessed, stored, reprogrammed and communicated by using radio waves. This technology is similar in concept to a cell-phone or "ATM-card" that is used in transaction of money.

In library context, RFID works by placing a 2"x 2" inch tag (made up of microchip with an antenna) in each library items. These items are needed to personalize through RFID-personalizer and read the tag during circulation process. Meaning, when library staff place items to be checked-out or checked-in, items are placed on RFID-personalizer, which read by identifying tag's antenna. The antenna enables the chip to transmit the information to the reader, and then the reader convert RF waves reflected back from the RFID tag into digital information. That can be passed onto PC and make use of it. This process is very easy, saving time and energy, and simplifying up-to-date inventory tasks in libraries.

RFID AND LIBRARY

At present when libraries of all kinds (public, research, special) are facing economic hardships the overwhelming reason for considering RFID technologies is potentially a lot more [2]. It is essentially a carrier technology that best fits under the umbrella of automatic identification, management of material flow and streamlines various other library operations. This article highlights few key-feature of RFID that make a difference.

1) Inventory management

Libraries spend a lot of money ensuring books are where they needed to be. Books with barcodes require humans to physically remove and handle every item to ensure it's in the correct location. But RFID offers the ability to analyze and make stock rectification without disturbing the day-to-day activities of library with quick succession.

So this system greatly improves inventory management and optimizes resources.

2) Economic facts

RFID technology is still too expensive to be used, because it expects to pay Rs25 per tag, also the cost of software and other equipments. The cost concern is still prohibitive however it possesses some economic facts that help to justify installing RFID system. For example, a lost book typically costs the library around Rs2000 approximately, an average library can have as many as 20million items circulating each year, but through RFID smart labels on item, check-in and check-out save nearly 1.5 minutes per transaction. Besides the unique identification, labels can be programmed, modify and update information, through re-writable facilities. So libraries don't have to replace a book's digital identification tag when updating a book's status or flagging a book for reservation. Now libraries are finding new ways to take advantage of RFID, such as minimize work stress of staff, saving time and money and gathering statistics on what items are most often used.

3) Barcode versus RFID

Barcode	RFID
Barcode readers require a direct line of sight, using laser technology.	Reading is done automatically using RF waves.
Scan and read one tag at a time.	Scan and read multiple tags simultaneously.
Reading by barcode take much more time	Reader can interrogate, or read tags much faster, appx.20tags per second.
Human intervention is required to scan a barcode.	RFID tag can be detected hands-off.
It should be visible on the product for scanning.	Tags can be concealed in any non-metallic items.
The readability of barcode can be impaired by dirt, moisture, abrasion or packaging etc.	RFID tags are not affected by those conditions.
Barcode don't have read/write memory.	RFID tags have read/write memory capability.
Less read range in comparison to RFID	RFID tags have a longer read range.
Technology is old and outdated.	Scope for more advancement.
Less expensive.	More expensive.
Ability hold limited data.	More data can be stored in an RFID tag, also facility for modifying it at later stage.

Table.1. RFID Vs Barcode

4) Others aspects

The primary reason behind the introduction of RFID in library is security and improves service to their patrons particularly by having circulated items available when they are needed. For concerning about the security mechanism it does a lot, it can easily prevent the theft in the library, by triggering the alarm of security-exit gate.

ARCHITECTURE OF RFID SYSTEM FOR LIBRARY

As discussed earlier, the implementation of RFID in libraries means automated identification, efficient and economic inventory, security, and circulation operations. Following are the essential components, standard and protocols that can be adopted in library.

1 Components

a. **Tags (Transponder):** The tag is paper thin, flexible and approximately 2"x 2" in size which allows inconspicuously on the inside cover of each book in a library's collection. It consists of an etched antenna and a tiny chip read-only or read/writable which having storage capacity of 2KB data that contain 96bits serial number. The chip stores vital bibliographic data including ID number to identify each item. The major function of the tags is hearing the RF wave and merely points to a database with barcode label data, which personalized before through RFID system software. In recent year, tags come in many flavors: passive, battery assisted, active, different frequencies, various anti-collision technologies, printed/wire wounded antenna etc. These days all RFID vendors in the library market offer read/write tags for easy updating, with anti-collision product (that enable to read several tags simultaneously). It has wide application like quick shelving and self check-in/ checkout.

b. **Antenna:** The antenna is a conductive element that attached with a tag, enable tag to send and receive data. It works as communicator among tags, reader and system. In general antenna produces radio-signal, that controls the function of data acquisition and communication (both for reading & writing data and activate the tag to work properly).

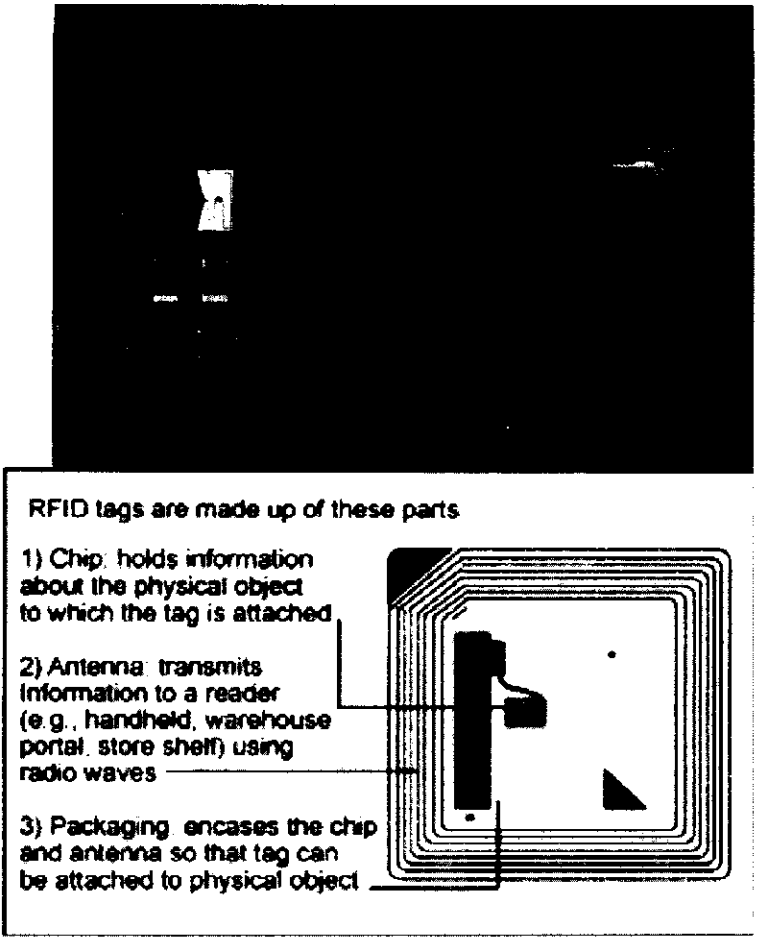


Fig1. A functional View of RFID tags, antenna & reader

c. **Transceiver/Reader:** The reader so called scanner or interrogator, which holds digital signal that turns the wave into bit of information, usably powers the antenna to generate a RF field. When a tag passes through this RF field, the information stored on the chip is decoded by the reader, and sent to the PC or Central server who in turn, communicates to the library information system.

In the recent year, library are using 3M Self Check TM systems to read the tags, these are used in the following eight ways (Boss, 2003):

- Conversion station- Where library data is written to the tags
- Staff workstation at circulation- Used to check-in and checkout materials.

- Patron self check-out/-in station- Used to checkout or check-in book without staff assistance.
- Exit sensors- Verify that all books leaving the library have been checked out.
- Book-drop reader- Checks in books when patrons drop them in book-drop.
- Sorter- Automated system for returning books to proper area of library.
- Portable reader- Hand-held readers for inventorying and verifying that item are shelved correctly.

d. Computer hardware (such as server/PC, inventory-reader and security gates):

- Server/PCs are the programming station for transferring necessary data from library database to the tag, and actively participate in the security/ anti-theft functions.
- Inventory- readers are used for stock verification and rectification purposes.
- Security gate placed in the entrance of libraries, it is used to detect whether a book has been properly checked-out or not. Otherwise alarm happens.

e. RFID software (such as RFID system controller): So called RFID system administration programs/ inventory software for library. These days so many RFID library system software vendors available in market internationally; such as Bibliotheca, Checkpoint, ID systems, 3M, TAGSYS, Vernon, Libsys and VTLS. In India several other companies like IBM-ISV, Microsoft India developer, Primasoft (Small library organizer pro, V1.5), iMagic etc, are providing product and material handling equipment that work with RFID. Functionally, Software tells the reader what, when, and for how long to read tags. During personalize the tag, the reader decodes the data encoded in the tag's integrated circuit (silicon chip) and the data is passed to the PC. The application software on the PC processes the data, (often employing PML an extended markup language), and disseminates tag information to be used in advanced data collection library systems.

Besides this, RFID system includes handheld reader, RFID label printer, and external book return like components for betterment of library services.

2 Standard and Protocols

The emerging standard pertinent to library RFID systems is ISO-15693. However, no formal standards are currently in place. A frequency of 13.56MHz is employed worldwide. For better application, SIP2 (session initial protocol), APIs (application programming interface) protocol are playing major role these days. It has made it possible for RFID products and library automation products to exchange information. Given below, The Table-2 showing detail specification of RFID Standard and Its characteristics (physical, environmental, radio wave, communication, power and certification).

Physical Characteristics	
Dimensions	400 mm x 200 mm x 120 mm
Housing	Metal
Environmental Characteristics	
Operating Temperature	0 to 50 °C
Storage Temperature	–20 °C to 70 °C
Enclosure rating	IP 65
Radio Characteristics	
Frequency	13.56 MHz
Sending Performance	2 x 2 W (at 50 Ohm), splitter configuration
Standard	ISO 15693
Communication Characteristics	
Data interface	RS 232
Data transfer rate	9,600/19,200/38,400/57,600/115,200 Baud
Protocol	STX/ETX
Indicator	Tag Data LED
Power Characteristics	
Power supply voltage	230 V AC 50 Hz
Current consumption	< 1 A
Electrical connections	Terminal strip, BNC connectors (antenna)
Switching inputs	2 x, Vin = 24 V DC, for e.g. triggering via photoelectric switches
Switching outputs	2 x, open collector (Ri = 100 Ohm), VOUTmax = 36 V, IOUTmax = 30 mA
Indicator	Power LED
Certifications	
CE approval	acc. to EN 301489-1, -3/ acc. to EN 60950/ acc.
Radio approval	acc. to EN 300330 (with released antennas), FCC Part 15

Table.2 Specifications of RFID standard

MERITS

The major advantages of RFID application in libraries can be summarized as;

1) **Increase Security**

- Security of material is automatic without staff intervention.
- Automatic items check out/ check in and sorting can be accomplished with LMS circulation software, therefore eliminating extra processing time of staff and make it economically viable.
- The accuracy of detecting a stolen item is very high, and identifies at security gate.

2) **High Reliability**

- The RFID readers are highly reliable, almost 100% detection rate.
- With the use of advanced anti-collision RFID labels multiple items can be checked out/ checked in at a time.

3) **High speed Inventorying**

- It is a unique advantage of RFID, through which shelf verification, shelf rectification and circulation processing become easy.
- It eliminates the time consuming process of barcode scanning and reading.
- Make library staff free from the risk of repetitive stress injuries.

4) **Rapid charging/ discharging**

- The use of RFID reduces the amount of time required to perform circulation operations.
- Self-charging and discharging possible.

5) **Longevity**

- RFID tags last longer than barcodes, because nothing comes into contact with them.

DEMERITS

Since increased efficiency and productivity in operation is the key reason for adopting RFID technology in libraries, it is not free of any concerns and criticisms. Some major pitfalls can be underlined as below;

1) **Technological barrier**

- Tags and readers are still too expensive

- Licensing and maintenance costs for using hardware and software are high and integration option limited.
- Reader performance must be improved to increase reader range, read quality (accuracy) and data integrity.
- Lack of proper standards and protocols, it need to be unique and inter-operable.
- Blocking the RF wave is easily done by anybody through ordinary aluminum foil/Mylar, also placing two books against one another so that tags overlays another that may cancel out the signal, need to protect.

2) Cultural barrier

- Privacy concerns could significantly delay the acceleration of item level tagging in libraries. Though library tags contain limited information like accession number, call number and title holding, but it can track a person easily in exit gates. Therefore, it is essential that all such information should be shared with users in advanced.
- Another cultural barrier to RFID adoption involves the relationship between retailers and libraries. Thus it is important to monitor legislative activity and prepare to inform legislators about the differences between retail and library applications.

1) Financial barrier

- The initial investment towards implementation of RFID is very high. Most of the costs are being used for upgrading, integrating and replacing application. So cost factor has discouraged many libraries to adopt this system.

2) Other barriers

- Item with odd shapes and metal components, such as CDs, DVDs are stretching the creativity of vendors of RFID systems for libraries.
- As we move to other documents like magazines, pamphlets, sheet music etc that may not have a good location for bulky 2inch tags and tag cost is significant.
- This system alternatively reduces staff and patron interaction, so that proper interaction cannot be maintained among them.

CONCLUSION

RFID technology is taking off in libraries at an increasingly rapid pace. Though there are few libraries employing this technology today, but due to its customizable feature and continuing improvement the library communities are beginning to get involved in its development. It is easy to envision that, the RFID tags contents will increase in power, prices are expected to decline and tag will dramatically improve its efficiency, security and accuracy. Also major concerns need to be addressed for successfully implementing this technology. So that it will change our personal and work lives in library and adorns the conventional library management with a new idea and usher for a bright future.

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ABSTRACT

The present study highlights the collection management policy of selected Science and Technology libraries of U.P. The present study also highlights the impact of information technology on collection development of these libraries. The total 400 questionnaires containing many related questions to collection management distributed among the users of 20 libraries (20 of each library). The respondent received 312 i.e. 78%. If we go to conclusion the users are not satisfied with present collection and collection development policy of the libraries. At the last of paper some suggestions and recommendations have given.

INTRODUCTION

Modern Information Technology has overcome those barriers and difficulties in gathering, storing, disseminating and making available relevant information without any loss of time for fostering researches and study and investigation through resource sharing specially via electronic medium of communication. The physical form of document is changed drastically as result of recent developments in microfiche, microfilm, magnetic disk, magnetic tape, CD ROM and DVD ROM etc. are means to miniaturise and substitute for large bulk of conventional documents available in libraries. **Information scientist Lancater has forecast that 21st century will be 'paperless society' because of the emergining trends in the physical form of documents.**

OBJECTIVES OF THE STUDY

The earlier scenario has drastically changed now, and various factors like- introduction of information technology (IT); resource constraints in institutions including budget cut: ever increasing expectations of users and complexity of availability of widely scattered materials; marketing information; human resource management; management information system; popularity of use of internet among the users; problems of search engines; new form of documents as CDs, DVDs, Cassettes, multimedia etc. have created the problems among the librarians in own hand and on other hand multi-dimensional attitude of research, globalization of information, expeditious growth in user's demands have created the problems against the librarians to come up upto the expectation of the users The objectives of the study are as follow:

1. To ascertain the relevance of collection to the interest of library users in electronic environment.
2. To identify strategies and applications Collection Management in libraries.
3. To identify the selection procedure of documents in these libraries.
4. To identify the ratio between right document to right user in right time.
5. To conceptualize and develop criteria for defining and measuring excellence in collection management.
6. To ascertain quality trends in collection management.
7. To finding the solutions of problems faced by these libraries in adopting the new technologies.

DATA ANALYSIS

The present study and investigation was selected with a view to highlighting the efficacy and efficiency of collection development in electronic environment in Science and Technological Libraries in Uttar Pradesh. For the purpose of the study User's survey was conducted to bring out the short coming and users view on these libraries and to know the collection management status of these libraries. The Researchers supplied 400 Users questionnaire, through the librarians of these libraries to be filling-up. User/ consumer are the only judge, who can easily evaluate an organization or a product, because he/she himself/ herself use the product or the services of an institution. These 400 questionnaires were distributed among 20 libraries equally .i.e. 20 to each library. Out of 400 users only 312 responded to the questionnaire, which helped a lot in compiling and analyzing the data needed for the purpose. Out of 312 filled questionnaires the percentage ratio of male & female respondent

was: there were 55% male and 45 % female respondent of the questionnaire. Out of 312 respondent user's 15% were Teachers, 10% Research Scholars, 65% Student and 10% were Administrative Staffs of concerned institute.

Question 1. General: Total respond

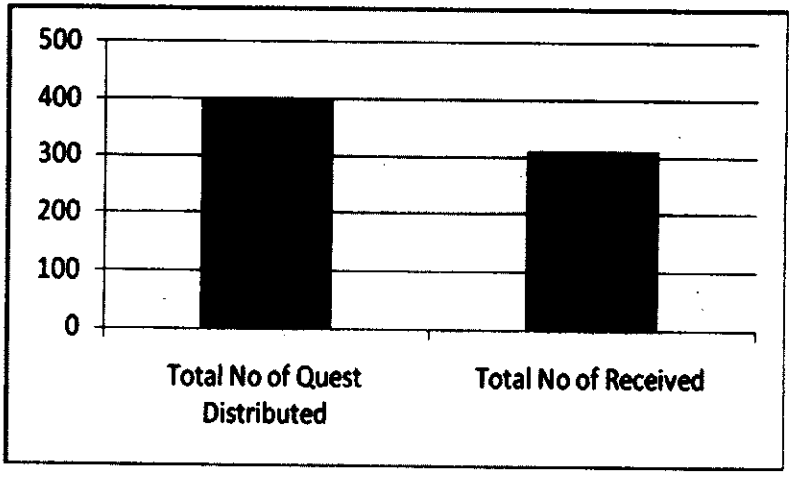


Table 2. Sex ratio of users

Sex	Institute Libraries					
	Science & Tech.	Engineering	Medical	Agricultural	No. of User	%
Male	41	53	37	41	172	55%
Female	27	36	42	35	140	45%
Total	68	89	79	76	312	100%

Table 3. Statuses of Users

S.N	Status	No. of User	%
1	Teacher	47	15 %
2	Research Scholar	31	10 %
3	Student	203	65 %
4	Administrative	31	10 %
5	Total	312	100 %

Table 3. Frequency of use of these Libraries

S.N.	Frequency of Use	No. of User	%
1	Daily	202	65 %
2	Twice a week	78	25 %
3	Weekly	16	05 %
4	Monthly	16	05 %
5	Rarely	00	00 %
6.	Total	312	100%

In response to this question of the questionnaire the respondent's described about their visits to the library. This reveals that how many times a user is visiting a particular library. The data revels that 65% users visit library daily, 25% go to library twice a week, 5% users use the library weekly and 5% user make their visit to library only one time in a month.

Table 4. Purpose of the Users to visit the Libraries

S.N.	Frequency of Use	No. of User	%
1	Reading text books	312	100
2	Consulting reference books	140	45
3	Consulting periodicals	218	70
4	Accessing e-journals	103	33
5	scholarly writings	94	30

Through this question, the researcher tried to find out the various purposes to visit the library. Through this researcher tried to find out, that on what side a library should pay more attention, what for users are visiting of the library. The data, it is evident from the (question no 2.1.2) that 100% user's said they go to consult the Text Books, 45% to consult Reference Books, 70% to consult Periodical/ Journals, 33% to Access the Journals available through Consortia/ Networks/ internet, and 35% of the users visit the library for / to collect materials for their Articles to be published.

Table 5. Library Purchase Material on user's Requisition

S.N	Institute Libraries	No. of Responded	To great extent %	To some extent %	To a little extent %
1	Science & Technology	68	5%	40%	55%
2	Engineering	89	35%	68%	29%
3	Medical	79	6%	23%	71%
4	Agriculture	76	4%	53%	43%

Through this question the researcher tried to find out, that how much importance, to an information seeker / user is given by these libraries and what they feel about the library regarding the importance to their suggestion / request is given by these libraries. The data presents that 5% users of Science & Technological Laboratories library say that libraries consider their demands for purchasing reading materials upto great extent, 40% say upto some extent and 55% say that libraries pay a little attention to their needs / suggestion to purchase reading materials.

In Engineering Institute Libraries this ratio differs and is 3% say great extent, 68% say upto some extent and 29% user say a little extent.

In Medial College Libraries the picture is like, 6% say upto great extent, 23% say upto some extent and 71% libraries pay a little attention to their demand.

In Agricultural Libraries the data presents that 4% users say upto great extent 53% say upto some extent and rest 43% are not satisfied with library in this regards.

Table 6. Library's collection meets informational needs of users

S.N	Institute Libraries	No. of Responded	To great extent %	To some extent %	To a little extent %
1	Science & Technology	68	11%	41%	48%
2	Engineering	89	9%	39%	52%
3	Medical	79	13%	45%	42%
4	Agriculture	76	17%	12%	71%

With the help of this question the researcher tried to know about the Collection Development Policy of these libraries, are these libraries, competent enough to satisfy the increasing demands of information of the users or not. The user / visitors of these libraries have given their opinion about the collection whether it satisfies their need or not the Data presents that:-

Science & Technological Laboratory Library: Collection meets the information need of the user 11% to great Extent, 41% to some extent and 48% little extent. Engineering Library: Collection meets the information need of the user 9% to great extent, 39% to some extent, and 52% to a little extent. Medical Libraries: Collection meets the information need of the user 13% to great extent, 45% to some extent and 42% to a little extent Agricultural Library: Collection meets the information need of the user 17% to great extent, 12% to some extent and 71% to a little extent.

Table 7. Time taken by your library in procurement of Indian books and Foreign books

S.N.	Libraries	Indian Books				Foreign Books			
		8-15 Days		More than 15 Days		Within One Month		More than One Month	
		User	%	User	%	User	%	User	%
1	Science & Technology	209	67	103	33	243	78	69	22
2	Engineering	156	50	156	50	222	71	90	29
3	Medical	87	28	225	72	162	52	150	48
4	Agriculture	115	37	196	63	212	68	100	32

This question was raised in the questionnaire by the researcher to know, the functioning of the library and to know how efficient these libraries are in providing the reading materials asked by the users and how much time taken in the process. The researcher divided this question into two parts one is for Indian Books and second is Foreign Books. The data collected for the purpose presents:

Time taken in procurement of Indian Books

Science and Technological Laboratory Libraries: 76% says within 15 days, 33% say more then 15 days. Engineering Libraries: For Indian books the opinion is 50 – 50 percent. Medical Libraries: 20 percent users said books are provided within 15 days and 72 percent said it takes more then 15 days. Agriculture Libraries: 37% users of Agricultural libraries have opined that Indian books procurement takes 15 days whereas 63% said it takes more then 15 days.

Time taken in procurement of Foreign Books

Science and Technological Laboratory Libraries: 78% say within one month and 22% say more than one Month. Engineering Libraries: 71% say books are provided by the library with one month and 29 percent say it takes more then one month. Medical Libraries: 52% percent and 48% percent means 52% percent say it takes one month and 48% say it is, more then one month job. Agriculture Libraries: 68% say it takes one month and 32% say it takes more than one month.

Table 8. Material requested by user comes within the time frame time

S.N.	Publications/Collection	To great extent	To some extent	To a little extent
1.	By Inter- Library Loan	17%	39%	44%
2.	If it is currently issued	29%	47%	24%
3.	If it is Untraceable	10%	59%	31%

This question was framed to know that how efficient these libraries are in providing reading material to their valuable user's means reading material that is not readily available, and to be located out by the staff of the library and then re-arrange for the users. For books on Inter Library Loan, is – 17% users say to great extent, 39% users say to some extent, 44% users say to a little extent.

Data for the books which has already been issued to a user, is to be provided on demand to another user shows: 29 % say upto great extent 47% say upto some extent and 24% say upto a little extent.

Data for the books misplaced and not traceable, with the help of this study the researcher tried to find out that how much pain is being taken by the staff of these libraries in providing required material to a user. The data presents that 10% say upto great extent, 59% say upto some extent and 31% say to a little extent.

Table 9. Main motive to access reading material in Electronic form

S. N.	Resources/Material	Motive (in Percentage)
1.	Books	35%
2.	Dissertation/Thesis	4%
3.	E- Journals	56%
4.	Conference proceeding	5%

Through this question the researcher tried to find out the main attraction of the users for the library so that it could be decided that on what direction library should take more care, as far as electronic means of information are concerned. The data revels that 35% users prefer to consult books in electronic form, 4% users prefer to consult thesis / dissertations in electronic form, 56% users prefer to consult Electronic journals and 5% users prefer to consult the proceedings of various subject related conferences in electronic form, available with in the library or available through Internet.

Table. 10. Users' Opinions regarding the use of computerization of Library and Internet are beneficial to you in Information Collection

S.N	Internet			S.N.	Traditional source of Information		
		User	%			User	%
1	Easy to use	228	73%	1	Difficult to use	84	27%
2	Time saving	240	77%	2	Time Consuming	72	23%
3	More Informative	275	88%	3	Less Informative	69	22%

4	More Expensive	265	85%	4	Less Expensive	47	15%
5	More Useful	259	83%	5	Less Useful	53	17%

The purpose to collect data on this issue was to know the attitude of the users of these libraries towards automation, computerization and Internet facility.

The collected data presents that 73% percent say it is easy to use computer and Internet 27% say it is difficult to use computer and Internet, 77% percent say it is time saving 23% say it is time consuming, 88% say information on Internet is more informative and wide, 12% say it is less informative, 85% say it is cheap to access information on net. Whereas 15% percent say it is more expensive, 83% percent have opined that computers are useful whereas 17% users say that computers in the library are not much useful.

Table 11. Frequency of use of Internet by the users

Frequency	Percentage
Daily	62%
3 to 5 times in Week	21%
2 to 3 times in Month	17%
Once a Month	---

The question was framed to know the users' attraction towards Internet means to find out the frequency of Internet access by the users. In response to this question 62% users say they use Internet in the library daily, 21% percent say they use internet 3 to 5 times in a week and 17% percent users say they use Internet 2 –3 times in a week.

Table 12. Internet has influenced your academic efficiency of Users

Percentage of Users	Great Extent	Some Extent	Little Extent
73%	Yes	No	No
19%	No	Yes	No
8%	No	No	Yes

Through this questionnaire the researcher tried to find out that upto what extent users of these libraries feel increase in the academic activities. Data collected presents that 73% users say that with the help of Internet their academic efficiency is increased upto great extent, 19% percent users say upto some extent and 8% say that there is a little influence of Internet in their academic efficiency.

FINDINGS & SUGGESTIONS

During the survey the researchers found that most of the users visit the library for reading the text books but their preferences in book selection

is unsound. None of the Institute library procures the books on users requisition; they purchase the books on basis of faculty's recommendations.

Here it is suggested that the documents procurement should be based on users (students) 'requisition based, Collection development policy should be change. The libraries should purchase current documents; they take help of Internet in this selection.

Researchers also found in table no. 6 that collection meet the users need upto a little extent. The collection of the libraries is not up-to-date.

Here it is suggested that libraries should procure up-to-date collection and collection in CD/DVD format to facilitate the users in electronic environment. Library also should procure maximum electronic journal for its users.

The computer infrastructure is not up to the satisfactory level and it need urgent improvement.

It is also suggested that number of computers and other peripherals should be increased so that the libraries could used maximum information available in electronic form specially e-journals.

The date is showing bad picture of inter library loan very few libraries are providing I.L.L. most of them are not involve in such type of activity which is the back bone of resource sharing. This is a traditional form of resource sharing and can help user's upto a great extent but unfortunately are selected libraries are not following the basic of resource sharing.

It is suggested that these library should make it mandatory to follow inter library loan trading form of library co-operation.

Reading material already available in book form in these libraries should be allowed to convert into electronic form under copy right act, otherwise the document a rare value be torn in transit while sending on inter library loan or could not be used by many other information seekers and the most important thing is that the concept of paper less library could not be fulfilled because information reserved in book and bound volumes could not be digitalized. Especially in the filed of the science and technology there are several documents, which are of much importance out of print and valuable and could not be ignored.

It is suggested that these libraries take initiative in establish Digital Libraries to facilitate its users and also subscribe the journals in electronic form as most of the users are interested to access these in electronic form.

Hear it is also suggested that these libraries should frame a balanced collection development policy for procurement of documents.

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Availability of Electronic Publication through Consortia: Need and Importance

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ABSTRACT

E-resources have become the fastest as well as largest growing areas of the digital collection for most of our libraries. E-documents are becoming increasingly in demand as it allows remote access as well as many users can use it simultaneously. It also saves physical storage space. This paper discusses library consortia in detail; explaining the origin, need objectives, advantages and many more concepts related to consortia. Apart from that it also covers the status of library consortia in Indian Scenario.

INTRODUCTION

Today we are in digital era, where libraries are moving towards smaller and smaller but with rich potential of information. In other words we can say that the information are stored, produced and disseminate in the form of bits and bytes. Libraries are based on digitized data of information that has gradually replaced paper-based records. Internet plays an important role in making these electronic journals available to the end users on their desktop computers. Libraries are social institutions whose aims are to provide library services to the people. Libraries play a special role in the digital era. The aim of the modern libraries today is to provide services not only to its registered members but also to every member of the society. In the present era computer and Internet plays an important role for the dynamic functioning of information technology. The growth of Internet technology is directly linked with the development of life and society.

The major objectives of library consortia are to make best use of availability and accessibility of resources and services to a wider category of users. Apart from that LC, also helps to coordinate in development of library facilities and services.

WHAT IS LIBRARY CONSORTIA

According to Oxford English Dictionary "Consortium means temporary cooperation of a number of powers, companies etc. for a common purpose. It is an association of similar type of organization / institution who are engaged for producing and servicing the common things / for providing services for a specific purpose of its users."[1]

As Dr. Ranganathan says that ***"Library is a growing organism"*** commands the whole world to the wave of Consortium. If the library becomes the part of the Consortium they can spread their wings all over the world with more resources and services.[2]

THE BEGINNING OF CONSORTIA IN INDIA

The proposal for consortia-based subscription to electronic resources was first discussed at length at the "**National Seminar on Knowledge Networking in Engineering & Technology Education and Research**" held at the IIT Delhi between December 1 and 2, 2000. On the recommendations of one of the work group of this Seminar, a preliminary proposal on consortia-based subscription to electronic resources was prepared and circulated to all IITs, IISc and RECs. On the basis of feedback obtained from these institutions, a revised draft proposal was prepared which encompassed other engineering colleges and institutions as beneficiary of this initiative. The Ministry, based on the last draft proposal, appointed an expert group in April, 2002 for "Consortia-based Subscription to Electronic Resources for Technical Education System in India" under the chairmanship of Prof. N. Balakrishnan, IISc. Bangalore to discuss elaborately on the e-resources with the publishers and aggregators and evolve a working model for execution of the consortium. The Expert Group submitted its report in Sept., 2002. [3]

WHY LIBRARY CONSORTIA

Access to resources is now considered more important than collection building. The consortium facilitated the libraries to get the benefit of wider access to electronic resources at affordable cost and the best terms of licenses. This paper looks at the issues related to the technology in a consortia environment that include the issues at the information provider/publisher, information agents/vendors and the member libraries levels.[4]

OBJECTIVES OF LIBRARY CONSORTIA

The main objectives of Library Consortia are as follows

1. To build up supportive and consortia solutions to the challenges faced by members, in the acquisition, processing, preservation, dissemination and delivery of information and library materials, for the benefits of their institutions.
2. To cope up with the different problems of libraries through proper coordination and cooperation.
3. To avoid the duplication.
4. To develop technological skills of the library staff in using e-resources.
5. To reduce information cost as well as improved resource sharing.
6. Single payment by one of the participants or through an agent and license has to be signed by all.

TYPES OF LIBRARY CONSORTIA[8]

1. **Open Consortia**

   This type of consortia is open ended and they provide the facility for the participating libraries to join and leave according to their interests. This type of consortia are generally motivated by small homogeneous groups who have a need to cross – share the resources in a specific subject area.

   Example: INDEST it is run by ministry of HRD, GOI.

2. **Closed group Consortia**

   The membership stays closed with in the defined group. This type of Consortia emerge either by affiliation or by a strong bond of homogeneity.

   Example: CSIR, IIMs, DAE Consortia.

3. **Centrally Funded Model**

   This type of Consortia solely depends on the central funding agency. The financial responsibility of running the Consortium is shouldered by the parent body.

   Example: UGC INFONET, CSIR, ICMR Consortia.

4. **Shared – Budget model**

   This is the only alternative where central funding is not coming.

   Example: IIM, FORSA.

5. **National Consortium**

National Consortium is the similar to CALIS in China. National level licensing of information products could be achieved towards this end.

Example: UGC INFONET, INDEST.

PREREQUISITES OF LIBRARY CONSORTIA[1]

1. Agreement among library authorities

A concrete agreement needed for the participating libraries to share all the e-resources they have as well as to achieve the common target. The participating libraries should follow the same mission of a consortium as a whole.

2. Management of library consortium

In order to run the consortium smoothly there is need of chief librarian from each library and one of them acts as a chief coordinator on rotation basis. It is duty of each library to tell about their collection, databases, training, user services etc to the chief coordinator.

3. Financial Control

Because of the financial crisis, libraries develop consortium for providing better services to the users.

4. Joint Work

All the participating libraries under library consortia must work jointly just like a joint venture in business sector to make the consortia a total success Each library will prepare the union list of titles to be covered under resource sharing programme and the member libraries may also send full content page service of all issues of the title to another library.

5. Evaluation

After a certain period, the whole activities of a consortium pre-determined objectives. If there is a need for any change in the path of action, it should be changed immediately to achieve the objectives of a consortium.

LIBRARY CONSORTIA IN INDIAN SENARIO

Here listed most successful library consortia in India and further details of each consortium can be accessed with respective website of the consortia institutions and organizations.

1. **AICTE-INDEST Consortium (http://paniit.iitd.ac.in/indest)**[5]
2. **UGC-INFONET http://web.inflibnet.ac.in/info/ugcinfonet/infonet.jsp).**[6]

FORSA Consortium (Astronomy and Astrophysics Libraries) (www.iiap.res.in/library/forsa.html).[7]

3. **CSIR Library Consortium** http://www.niscair.res.in/Activitiesandservices/MajorProjects/majproj.htm#ejournalconsortia)[7]
4. **IIM Library Consortium**[8]
5. **HELINET(Rajiv Gandhi University of Health Sciences Karnataka) (http://www.rguhs.ac.in/hn/newhell.htm)**[8]
6. **ICICI Knowledge Park (http://www.icicikowledgepark.com/)**
7. **DAE Library Consortium (http://www.tirf.res.in/libws)**
8. **ICMR Library Consortium**
9. To have integration of library and information services of a system **ISRO Library Consortium**
10. **Open Access e-journals portal in India (http://www.openj.gate.com)**

Advantages of Library Consortia

1. With the help of library consortia e-resources provide access to wider number of resources at least cost.
2. It will provide integrated access allowing greater search capabilities across multiple databases.
3. Through Library Consortia time efficiency is gained.
4. Staff development and interaction enhances the quality of services.
5. To economics cost of organization and management of libraries.
6. Optimum utilization of funds.
7. Available 24 hours a day.
8. No requirement of space for E-journals[9]

CONCLUSION

It is impossible to acquire and store all documents within four walls. In order to satisfy the needs of the users it may have depends upon the other libraries. There has been specialization in the collection of the libraries. One has to approach such special collections to meet the special needs of its users. The library budgets are decreasing and costs of documents are increasing with the result of number of documents being added to the libraries is decreasing. Library Consortia in the libraries is very important area of their management, which not only enhances the use and utilization of library resources and services but also ensures optimum benefits to their users in the utilization of e resources of all kinds. It

serves not only to effect economy in terms of time and money but also ensures much better services to the users.

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Co-operative Collection Management: A State-of-the-Art Report

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ABSTRACT

Since 1990s, Collection management has become a primary concern for all types of libraries as libraries are confronted by increasing information resources and decreasing fiscal resources. So, resource sharing or networking among different libraries become vital to meeting the information needs of all. A paradigm shift leaving some librarians out of the collection management decision making process for electronic databases. Librarians need a vision and perseverance to learn the new technology to cope up in this new paradigm. Though there are various types of barriers exist e.g., turf protectionism; lack of support, commitment or leadership; lack of knowledge; low priority and low quality collection; human procrastination; inadequate in respect of users' need but there are many facilitators which are the driving force towards cooperative collection management e.g., promotion of more systematic collection with minimum budget, internet facilities in village level libraries, library automation, implementation of digital imaging system and so on.

Keywords: Collection assessment, Collection development manual, Digital imaging system, Interlibrary loan, Library networks, Systematic collection

INTRODUCTION

Cooperative collection management among libraries of all types is a decade-old enterprise which has excited and challenged hundreds of library managers, library network administrators, and collection development libraries. [Mosher, 1988, pp.29-32] In the preface to his book, Harloe (1994, p.vii) says:

In the last decade, collection management has become a primary concern for all types of libraries. As libraries are confronted by increasing information resources and shrinking fiscal resources, and as online

bibliographic access proliferates, coordinated and cooperative collection development as well as shared access to materials become vital to meeting the information needs of all.

As we enter the 21st century and a period of great technological change in libraries and library networks, it seems appropriate to review, and to speculate about, the two primary aspects of cooperative collection management: cooperative collection development and cooperative collection assessment.

The environments in which the facilitators are more likely to occur are also addressed in the context of library networks, consortia, systems, authorities, or other cooperative arrangements. Library networks or consortia, meaning a "group of individuals or organizations that are interconnected to form a system to accomplish some specific goal. This linkage must include a communications mechanism. Thus, two or more libraries which have agreed to cooperate with each other for cooperative collection assessment and cooperative collection development would meet Martin's criteria, assuming that the libraries communicate with each other regarding these programs. This broad definition includes public library systems like Philadelphia's, regional networks like AMIGOS or SOLINET, large university library systems with separately administered libraries like the University of Texas, and area library system authorities like those in the state of Indiana.

Library Networks

On the basis of Models

Library networks may be classified in a variety of ways. California legislation outlines an "all-in-one" or "multidimensional" model. [Fiels et.al., 1991] All-in-one cooperatives are networked together under one regional entity. Multidimensional cooperatives are linked in geographic clusters, or the libraries are linked to like libraries throughout the region.

On the basis of Area

McCrossan (1980) classifies library networks as single or multijurisdictional; both types may be loosely or tightly governed, but are nonprofit.

On the basis of Functions

Library networks may be categorized by the functions they offer; however, most networks provide both primary and secondary functions. The *American Library Directory* specifies the primary functions of the library networks and consortia it indexes. The vast majority of these primary functions involve interlibrary loan, information resources sharing, reciprocal borrowing, union listing, continuing education, and

staff development functions. It seems obvious that networks were formed by libraries primarily to share their collections, staff expertise, and an economy of scale made possible by larger orders. In these ways, networks can help member libraries provide better services and collections. The desire to improve services and resources for their users, of course, is raison d'être for libraries, and should be for networks as well, although they work through, or on behalf of, their member libraries.

It is clear from examining the entries of the *Directory* that cooperative collection development and cooperative collection assessment, or other aspects of cooperative collection management such as preservation and storage, are either secondary functions of library consortia, or not a function at all.

On the basis of Nature of Rendering Service

Some library networks are non-profit making and others are profit making or commercial library networks like Dialog.

WHY COOPERATION?

Cooperative collection development is typically expected to meet one or several of the following, not necessarily compatible, needs:

Broadening Access

Scholars require ready access to the full printed record, yet comprehensive acquisitions are beyond any library's reach. Distributed collecting responsibilities will enable groups of libraries to acquire a wider variety of materials than anyone could manage on its own.

Containing Cost

Research libraries spend a great deal to duplicate materials held at other institutions. Coordinated acquisitions will save money by minimizing redundancy. Cooperative collection development is the best way to contain library costs.

Improving Coverage

Publications from some world areas remain uncontrolled and unsystematic. Even the richest and most conscientious library will miss some materials. Cooperation improves the chances for complete coverage.

Ensuring the Exotic

Universities face intense fiscal pressure. Most academic libraries are charged with supporting present and future scholarship, implying acquisitions that may receive neither early nor frequent use. Cost-cutters

may see such purchases as a frill. "Esoteric" acquisitions can be justified in the context of a national cooperative plan.

Arguments asserting the virtues of cooperative collection development are buttressed by two technological trumps. In the first place, successful cooperation presumes both a common knowledge of what has been acquired and efficient mechanisms for document delivery. Online bibliographic databases and electronically based interlibrary loan support these requirements as never before. The second and still embryonic development centres on electronic formats. Digital communications and electronic storage nullify the logic of ownership and the logistics of location. The promise - and challenges – of electronic cooperation are fundamentally new.

ROLE OF COLLECTION DEVELOPMENT MANUALS

Most libraries of all types and sizes generally have procedures for the selection and acquisition of books, periodicals, and other materials, not all libraries have written collection development manuals – nor wish to write them. Gorman and Howes note that the national libraries like the British Library and Bibliotheque Nationale, as well as many of the historically considered great university libraries existed for many decades without the benefit of such policies because they "...simply relied on their genuine passion for literature and inbred instinct for what was 'right' when collecting." Merritt (1979) blames the "natural human procrastination rather than ... disagreement or opposition, through some disagreement may indeed exist." No matter what the reason, this author doubts that the situation is different when it comes to wanting to write cooperative collection development policies. In reality, very little information about actual collection development practices and policies of libraries or networks is known, because such policies are not collected anywhere centrally at the state and national levels. We do know more about research level libraries, however, because their policies are often reproduced in the literature, particularly by the Office of Management Studies of the Association of Research Libraries (ARL). The hundreds of libraries that use the RLG, WLN, or other Conspectus approach follow somewhat standard collection coding strategies and practices. There is an understandable but disappointing state of affairs, which is especially true of public and special libraries. It should be no surprise, then, that we generally know very little about the cooperative collection development and cooperative collection assessment policies and practices of libraries that belong to library consortia.

COLLECTION MANAGEMENT & THE FUTURE OF LIBRARIAN

As access to both citation and full-text databases has increased during the

1990s, the idea of building library collections seems to have become a more distant thought, or is being questioned by more librarians or other administrators in the parent organization. As vendors and library networks have offered more electronic databases to their clients, many librarians and library network managers have worried about their future viability. A paradigm shift leaving some librarians out of the collection management decision making process for electronic databases. Not all librarians are sure that more cooperation among libraries helps to maintain libraries and library networks as vital organizations in the collection, assessment, storage, retrieval, and dissemination of information and literature. Librarians who are able to affect such cooperation need to realize not only the potential value of the electronic media, and cooperative collection management, but also the ramifications.

It is important to understand, however, that the cooperation which is essential if libraries are to remain useful to their clients is not just limited by formal, interlocal government agreements, bylaws of library consortia, and network agreements. Academic libraries and computing centres, for example, have been cooperating on many campuses and in many systems for decades without agreements or bylaws. Such alliances have seemed natural, expected, and taken for granted. Some directors of both the library and computing services have been reporting to the same chief university administrator for many years; the practice may increase as libraries become more dependent on campus area networks and computing resources. Many academic libraries have become almost totally reliant on the campus computer services department for library automation, database management, and related services, unless they maintain their own computer systems. The similarity of their information-related goals has led some computer centres to install CD-ROM databases on their systems independently of the library. This is likely to be the case with public libraries and school libraries, where teachers will ask system staff, not librarians, to install CD-ROM titles on the system. This is but one example of collection development decision making being taken from the librarian.

CHANGE IN THE NATURE OF LIBRARIAN'S JOB

A growing percentage of the budgets of all libraries, as well as library networks, is earmarked for the purchase of electronic databases, licenses, development and maintenance of integrated library systems, microcomputers, computer printers, related supplies, microcomputer maintenance agreements, and software. The types of decisions associated with these matters are more managerial, often based on costs, license agreements, computer support, and the like. Academic reference librarians are spending less time helping students with printed sources

and more time teaching them how to access the electronic databases. For more academic librarians, collection development responsibilities should represent a decreasing percentage of the total hours worked.

Future library cooperative collection management and resource sharing activities are likely to include electronic media and telecommunications for rapid retrieval and dissemination of information and text because library budgets are not growing fast enough to keep pace with inflation and the demand for print materials. It seems to follow that the attention of librarians will be refocused on working cooperatively through their library consortia to share the costs of electronic databases. These technological advances have led to dramatic changes in how library staff and patrons access bibliographic information, obtain the holdings information of their home library and those of other libraries, and use (or do not use) collections and libraries.

LARGE DATABASE: STIMULUS IN RESOURCE SHARING

Dougherty (1988) emphasizes that the availability of large databases such as OCLC and RLIN stimulate greater participation in resource sharing activities. Libraries with Internet access can easily, conveniently, and inexpensively check the holdings of libraries with known strong collections in any subject area. Cooperative collection assessment and development efforts, then, have been enhanced by the ease with which librarians and users are able electronically to consult local and other libraries' holdings. Librarians may decide not to consider the purchase of an expensive title or series because another library's online catalog shows that a copy is held in that location. Moreover, less importance has been attached to the proximity of the holding location as more and more libraries around the world input their bibliographic records into OCLC's union catalog and use its ILL subsystem.

BARRIERS TO COOPERATIVE COLLECTION MANAGEMENT

Despite the paradigm shift evident in the growth of cooperative collection development activities, there are many barriers to effective cooperation. Some of the more significant barriers are discussed in the following:

Turf Protectionism

Turf protectionism, or a desire to be self-sufficient, is a major blockage in cooperative collection management efforts. This "custodial attitude" is characterized by a library director whose limited vision fosters the belief that cooperation will decimate the collection, take too much staff time and money for committee meetings, and result in spending local funds on materials or programs that will benefit the users of other libraries more than the local library. [Martin, 1986, p.90] Sharing cooperative collection

development responsibilities with members of a local consortium, therefore, might mean loss of autonomy as well as loss of resources. Mosher (1988, p.29) notes that "each institution's natural desire for academic self-sufficiency...helps to foster competition among American university research libraries and a myth of the self-sufficient 'comprehensive' collection necessary for any library with pretensions to greatness." Research libraries are not unique in this feeling and spirit. "Co-operative resource sharing arrangements must be perceived as being mutually beneficial," says Dougherty. He adds that this does not mean "absolute borrowing/lending parity is essential."

Lack of Support, Commitment or Leadership

A lack of support, commitment, or leadership on the part of library directors or their governing board weakens cooperative collection management efforts. The unwillingness of some library directors to share decision making through committees, or their reluctance to obtain input about procedures, methodologies, and public relations leads to lack of backing on the part of staff involved in cooperative collection development. Lack of support and commitment on the part of some or all of those charged with collection development responsibilities can limit progress in selection and ordering procedures.

Failure to Develop and Operate Cooperative Collection Management

The failure to develop and operate a cooperative collection management program under the auspices of a formally recognized, if not legally constituted, governing structure such as a library system, network, area authority, consortium, or parent institution might deter progress. A school or medical board, for instance, might block or restrict cooperative collection management programs because library services are not one of their primary goals.

Lack of Knowledge and Training in Collection Development

Lack of knowledge and training in collection assessment, collection development, or other aspects of collection management by members of the libraries' governing bodies, administrative superiors, or members of the staff with collection management responsibilities is also a handicap. When librarians are assigned collection development responsibilities without training in how to recognize quality materials, many excellent materials may be overlooked or poor materials ordered. Spending scarce dollars on the preservation of titles that contribute to the depth and breadth of the library's and the consortium's collection is also essential for cooperative collection management efforts. It should not be assumed that new librarians or staff with collection development responsibilities inherently realize the criteria to be used for cooperative collection development purposes, much less understand the goals of the network.

Lack of Budget

The lack of budget for acquiring the essential monographic, serial, and electronic titles to meet the primary or core needs of users is a further barrier in cooperative collection development. The first priority of collection developers is to acquire the materials needed to serve local users, not the needs of users in other libraries. Also, this barrier might be expressed in terms of cost-to-benefits. Many do not see the benefits of cooperation accruing to the local library; the money spent on travel to attend network meetings is seen as money better spent on the acquisition of essential monographs or serials. These librarians distrust the claims that cooperation results in savings or cost avoidance at the local level. In any case, these librarians find it very difficult to explain the advantages, purposes, or goals of the network because their library's local services seem to be entirely sufficient to meet the demands of users.

Low Priority and Low Quality Collection

Some librarians and library users might believe that cooperative collection development will result in splintering the collection by acquiring low priority materials which contribute little to the depth and quality of the collection. Although the number of people who acknowledge the need for resource sharing might be increasing, Dougherty (1988, p.288) says "there is a fear among faculty that, over time, such programs of divided collection responsibility will diminish the luster of their own program's reputation and could ultimately influence academic decisions regarding appointments, promotion, and tenure.

Inadequate in Respect of Users' Need

The rationale that interlibrary loan (ILL), commercial electronic document delivery services, or other means of resource sharing can fill voids in a library's collection has not gained favour among a large percentage of users. Dougherty (1988, p.288) notes many faculties at his institution were adamant in their view that performance of the existing document delivery systems – i.e., ILL- was "woefully" inadequate for their needs. It is probably true that the attitudes of some users toward interdependence have changed; it is probably also true that others remain staunchly opposed to the proposition that access to collections should be dependent on document delivery. For this latter group, the memory of four—to six-week ILL delivery performance may never fade away.

Problem of Dealing with Accreditation Standards

Librarians, bibliographers, faculty and other users share a spirit of interdependence. Most libraries embrace cooperative collection management in the hope that their libraries will be able to offer improved access to materials by reshaping collection behaviour to reflect greater reliance on resources held in a range of libraries. Dougherty (1988,

p.289), however, acknowledges that few faculties he talked to had developed this spirit of interdependence; he also discusses the problem of dealing with accreditation standards, adding:

Clearly, so long as accrediting agencies and academicians use size of library collections as the principal criterion for judging quality, and fail to give consideration or recognition to cooperative development programs, faculty and librarians will continue to view with suspension cooperative programs which divide up responsibility for collection development along disciplinary lines.

Human Procrastination

Human procrastination and avoidance of the difficult or time-consuming activities, especially if failure might be likely, is another chief hurdle in the way of cooperative collection management activities. Bishop (1987) adds clash of personalities, jealously, stubbornness, indifference, unwillingness to experiment, mistrust between librarians, and an assumption that each library has unique rather than common needs and goals as attitudes of librarians which act as barriers.

FACILITATORS OF COOPERATIVE COLLECTION DEVELOPMENT

If there are substantial barriers to cooperative collection development, there are also numerous factors that facilitate positive growth in this area.

Increasing Cost of Library Materials

The ever-increasing inflation in the cost of library materials, particularly serials, is a chief facilitator of cooperative collection management. When cooperative collection management can be viewed as a strategy for stretching library budgets and coping with inflation, the spirit of cooperation and interdependence increases. Cooperation manifests itself first for periodical titles because of the more rapid inflation in their prices. Faxon's and Ebsco's customer newsletters and correspondence regularly note factors in serial price increases such as size of issues, rising cost of paper, and changes in the value of U.S. currency. Increases in the output of book publishers, the need to publish in new formats such as CD-ROM, E-Journals, E-books and the growing emphasis on access have resulted in subscription cancellations and reliance on commercial document delivery and ILL services of other libraries. The price that remaining library subscribers must pay increases further as the total number of subscriptions declines.

Promotion of More Systematic Collection

Harloe (1994, p.3) identifies a specific benefit of cooperation as "promotion of more systematic collection development planning to

permit calculated responses when library income becomes flat or decreases." Dougherty (1988, p.288) identifies the importance of each institution being able to contribute unique titles to the consortium. Union listings and agreements to hold the last remaining subscription and backruns are often first programs because the libraries should be able to obtain and analyze lists of subscriptions by title or call number without much difficulty. Library consortium or network members can analyze the results in concert with each other far more easily than for monographs.

Internet Facilities in Village Level Libraries

Since the 1980s there has been greater pressure from educators, librarians, and residents of rural areas all across the United States for parity of access to library materials. Distance and rural education programs, including rural librarianship programs, have increased since then. In the 1990s, this effort is being fed by expansion of the Internet and rural education networks which will take fiber optic cable to rural areas. The impact on collection management which the Internet will have in small and rural areas, both public and school, will be dramatic once such systems are firmly in place. As rural residents gain access to the world's literature through electronic means or interlibrary loan, it is likely that rural libraries will have to spend a higher proportion of their budgets on electronic access, thereby putting more strain on their materials budgets. In India, all universities have internet facilities but the speed is not up to the mark for 80% of the universities, not all colleges have internet facilities. So the internet facility in village level libraries is just a dream. So, after the twenty years of worldwide initiatives, cooperative collection management is still confined with IITs, IIMs, and other central government R&D institutes and some elite universities in India.

Implementation of Digital Imaging Systems

The need for new types or methods of storing, retrieving, cataloguing, and preserving the new formats and electronic databases will challenge and invigorate cooperative collection management efforts, if funding can be found and if costs continue to decline. Digital imaging systems, for example, are just beginning to become economical as a means of full-text delivery and preservation of brittle materials, photographs, and archives.

Implementing Authority

How the cooperative management program is implemented and who is involved – or not involved in implementation – is as important as its structure and methodologies. Dougherty (1988, p.290-91) adds, "there is another requirement for the efficient and effective operation of the model – that is, the ability of selectors to communicate with one another in an easy and timely fashion." Strong leadership, broad support, and unfailing

commitment on the part of library directors or others who make decisions regarding the funding for cooperative collection management activities, including training, training materials, committee meetings, staff support, and time, are absolute requirements.

The involvement or representation in decision making of those who will be participating in the cooperative collection development activities is essential to gaining their commitment. Unless they are involved, or represented through committees or other processes in the decision-making processes, they will not facilitate the successful implementation of cooperative collection management programs.

PRINCIPLES FOR SUCCESSFUL COOPERATIVE COLLECTION MANAGEMENT

After reviewing much of cooperative collection assessment and development literature, some principles may be preferred as the foundation on which successful cooperative collection management rests. Principles are as follows:

1. Cooperative collection management assessment and development programs of library networks provide the best solutions at the local, state, regional, or national levels to the continuing explosion of publications and information resources and their rising costs;
2. Budgetary, psychological, environmental, philosophical, educational, political, societal etc. variables might be barriers in one instance might be facilitators in another instance;
3. Cooperative collection management programs are less likely to be developed when barriers such as turf protectionism, fear of dependence, or lack of knowledge by some governing board members, library directors, or collection development librarians stand in the way;
4. Collection assessment is the cornerstone of successful cooperative collection development programs;
5. The support and commitment of the network's library directors alone is not enough for the success of network level cooperative collection development programs;
6. Support and commitment can be dictated by the library's governing board, or parent organization, as a cost saving measure, or it can be pursued by collection developers or library directors.
7. The success of and support for cooperative collection management programs by professional and paraprofessional

library staff are more likely when they feel it is necessary to meet the basic needs of users.

8. Successful cooperative collection management programs assign primary collecting responsibilities to the member libraries having the strongest collections and collecting interest in particular subjects or topics. [Wood & Strauch, 1992]...and more.

CONCLUSIONS

Although cooperative collection assessment and development programs are not a primary function of the several hundred library networks, consortia, or systems in India, they are essential in making as much of the world's literature as possible available to users through their member libraries. Print resources should continue to be published and collected by libraries for many decades into the 21st century because books, journals, and documents are preferred by scholars and recreational readers. Electronic media, on the other hand, might someday overtake printed resources for reference sources, as well as scientific, technical, medical and similar fields where information and data change rapidly. Growing user preferences for electronic periodical and other databases have already severely affected the budgets of libraries because they represent yet another format that must be acquired. Many barriers in the way of cooperative collection development have been suggested: turf protectionism, the difficulty in obtaining commitment, lack of leadership by library or network directors, restrictions by the parent consortium. Lack of support, lack of commitment, lack of training, lack of funds to acquire materials beyond a core collection-such barriers can put an abrupt halt to cooperative collection assessment and development programs. At the same time, any number of facilitators working in concert can result in a successful cooperative assessment and development program: Strong leadership by a library director; pressure from a parent consortium, board, or paid members to save money; the lack of an adequate materials budget; and the inability of any library to acquire the materials needed by its primary clientele because the number of titles steadily increases. The retrospective conversion and automation projects of libraries that have contributed in the holdings of large databases have greatly facilitated collection assessment and development activities in libraries and library consortia by making resources of one library known to others who have access to the appropriate bibliographic utilities.

A successful cooperative collection assessment and cooperative development program can be a highly positive public relations tool which helps to convince the paid members that the libraries are maximizing their resources. Cooperation in the collecting of materials

with other libraries does not need to lessen the quality of the member's own collection, but it can lead to strengthen the quality of all the members-assuming that each member has ready access to the others' collections through other resource sharing practices such as interlibrary loan and reciprocal borrowing. At the very minimum, each member should have and maintain a strong collection for its primary clientele. Members can at the same time, however, cooperate with many other libraries to build a stronger collection across the network. By providing all of the member libraries' clients with easy access to the consortium's collection, every user and each library benefits significantly from being able to provide more materials than it could have alone.

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Digital Collection Building and Challenges: Case Study of IGNCA

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ABSTRACT

The Digital Library now emerges as a crucial component of global information infrastructure in creating, preserving, indexing and retrieving the various forms of the digital assets. The IGNCA Digital Library provides cost effective facility for systematic archiving of research results and others documents of the institution. This paper will discuss about various E-Collections at IGNCA Library and explains the infrastructure (Hardware, Software and Network) and the most common issues which are arise in requirement for creating and managing the E-collections. It provides web based mechanism to deposit and access the same to the user community on to their desktop through intranet. It also illustrates how to build up digital repository using the DSpace software and creating the community, sub-community.

KEYWORDS: DIGITAL LIBRARY: IGNCA; Digital Libraries; Digital Library – art and culture; Dspace, E-Collection

INTRODUCTION

The Indira Gandhi National Centre for the Arts, established in the memory of Smt. Indira Gandhi, is visualized as a center encompassing the study and experience of all the arts- each form with its own integrity, yet within a dimension of mutual interdependence, interrelated with nature, social structure and cosmology. This view of the arts, integrated with and essential to the larger matrix of human culture, is predicated upon Mrs. Gandhi's recognition of the role of the arts as essential to the "integral quality of a person, at home with himself and society." It partakes of the holistic worldview so powerfully articulated throughout Indian tradition, and emphasized by modern Indian leaders from Mahatma Gandhi to Rabindranath Tagore.

The arts are understood to comprise the fields of creative and critical literature, written and oral; the visual arts, ranging from architecture,

sculpture, painting and graphics to general material culture, photography; the performing arts of music, dance and theater in their broadest connotation; and all else in fairs, festivals and life style that has an artistic dimension.

DIGITAL LIBRARY

Digital Libraries are networked collections of digital texts , documents, images, sounds, data, software, and many more that are the core of today's internet and tomorrow's universal accessible digital repositories of all human knowledge. According to the Digital Library Federation (http://www.dlf.org), "Digital Library are organization that provides the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collection of digital works so that they readily and economically available for by the a defined community or set of communities".

In India currently the concepts 'digital Library' is being practiced by and large loosely or even confused by many information systems. It is therefore imperative that the concept is properly understood so that there is no ambiguity while we progress with the work of designing or developing a digital library which s fully justified in the technical sense of the word. It is embarking on a digital library project is something which will take away substantial amount of time. Money, energy, manpower and of-courses the hard earned money being pumped into it-be it for system development or towards development and maintenance of the collection, in a meaningful way. There is consensus all over that there exists a very large quantum of digital information scholarly as well as trade, which are scattered and distributed throughout the internet and also being stored in numerous other database and repositories spread across the world. Also there is an unprecedented technology support and availability for digital library.

FEATURES

Digital library have attracted almost all the developed and developing countries due to it features and the opportunities it extended to the information providers and information seekers. The digital library has the information in the electronic form and electronic media facilities the access to information available in digital form at different places. It offers new levels of access to broader audience of users and new opportunities for library and information science field to both advance theory and practice.

They contain information collection predominantly in digital or electronic form. Electronic publications have some special problems of

management as compared to printed document. They include infrastructure, acceptability, access restrictions, readability, standardization, authentication, preservation, copyright, user interface, etc. but still the advantages are more and therefore the importance of digital library has been recognized by all nations in the world. Digital library do enable the creation of local content, strengthen the mechanisms and capacity of the library's information system and services. They increase the portability, efficiency, flexibility, availability and preservation of content. And the most important is 'anytime, anywhere access to the best latest of human thought and culture.

CHALLENGES IN THE DEVELOPMENT OF THE DIGITAL LIBRARY

A) LACK OF INFORMATION & COMMUNICATION TECHNOLOGY: Internet connectivity with sufficient bandwidth, High end and powerful Servers, Structured LAN with Broadband Intranet facilities are the highly essential for an ideal digital library environment. It is observed that the ICT infrastructure in most of the Institutions. Organizations, barring exceptions, are not up to the desired level so as to run advanced digital library services to the optimum level.

B) METADATA STANDARDS AND PROTOCOL: Metadata, or "data about data," is a critical element for searching information through a database especially, when the information available in an invisible space like the Internet, unlike a conventional library. The function of metadata is to standardize the structure and content of indexing or cataloging information. At present, in order to build digital library one can use of Dublin Core for web-based publications, Encoded Archival Description (EAD) for archiving and Visual Resources Association (VRA) for visual data. Consortia such as the INFLIBNET and INDEST are involved in developing Indian metadata standards and software applications as part of the Open Archives Initiative Protocol for Metadata Harvesting (OAI_PMH). This would be used to automatically extract metadata information from digital libraries and enhance interoperability between systems.

C) DIGITAL RIGHTS MANAGEMENT: Due to vulnerability of materials accessible over the public access networks like the Internet, the issue of IPR of material over the digital domain has become a serious concern. Digital Rights Management involves ways in which the digital library operators manage issues of IPR, those of ownership of material made available on the digital library, how one controls access to as well as dissemination of copyrighted material.

D) DATA FORMATS AND PUBLISHERS POLICY: Variations in the data format like Digital library software's usually accept and process all popular and standard digital formats such as HTML, Word, RTF, PPT, or PDF. And most of the the publishers put their materials in their own proprietary e-book reader formats, from which the text extraction becomes almost impossible and One has to obtain publisher's consent and copyright permissions for the same which is a challenging tasks.

E) LACK OF TECHNICAL SKILLS: The Human Resources available in the libraries need to be trained with latest technology for implantation of digital library concept which is playing around in the new information environment. The kind of training programmes given in India is not able to meet the demand in terms of quantity as well as quality.

E-COLLECTIONS AT IGNCA LIBRARY

Rapid growth of digital libraries together with professional publications and the popular press have created a lot of hopes as well as myths about digital libraries. The increasing popularity of Internet and developments in web technologies is a catalyst to the concept of the digital library. Kalanidhi Division of IGNCA is a National Information System and Databank of the arts, humanities, Cultural Heritage etc. A fully supported Reference Library of multi-media collection, the information system in databank for research in humanities, in the arts and disciplines of archaeology, anthropology, philosophy, literature, art and craft etc. is under the disposal of all researchers in India & abroad is the said field. Collections of about 2 lacs cultural archival material along with 1700 rare books are some of the unique collections at Kalanidhi Division. 2.5 lacs manuscript in microfilming format, 1 lac visuals more than 1000 hours of Audio Video recordings, 9 personal collections of eminent scholars and artists, photographic collection of eminent photographers such as Lala Deen Dayal are some of the other points of attraction at Kalanidhi.

The library is conceived as a major repository of reference material, primary and secondary, relating to the humanities and the arts. It will encompass the disciplines of Archaeology, Anthropology, Ethnology, Philosophy, Literature, Language, Arts and Crafts. It will concentrate on Encyclopaedias, dictionaries, bibliographies, atlases and also catalogues of unpublished manuscripts of Indic and Asian origin. Its acquisition programme of current publications will support the research and publication activities of the other Divisions.

One of the Prime aims of IGNCA is to serve as a major resource center for the Arts, especially primary material, written oral and

visual. The various digital resources available at IGNCA are shown in table below:

Bibliography	IGNCA Journal and Newsletter
Databases	CD-ROM
A/V Collections	IGNCA Publication
Digital Images	COIL-Net Content development in Indian Language Network
Microfilms	Microfiches
Rare Books	Archival Collections

DIGITAL LIBRARY INITIATIVES

IGNCA has established the digital information system in a multi-user environment using Linux operating system. Access to information, search and retrieval from client node is made easy with Graphic User interface (GUI) through web based browser. Digital Library in IGNCA is hosted Intranet along with Web OPAC.

INFRASTRUCTURE REQUIREMENT FOR CREATING AND MANAGING E-COLLECTION

Basic requirement for the e-collection and digital library is well established and planned network environment in an organization. In IGNCA Library almost all the terminals are having the connectivity with 100 Mbps local area network with high –speed multiprocessor servers and powerful workstations for high data transfers and powerful workstations for high transfer rate over intranet.

A) SYSTEM REQUIREMENT

Hardware requirements: IGNCA at present has Pentium IV processor with 80 GB memory on which E-Collection is hosted.

Software requirement: The server is running on Linux operating system (Ubuntu 8.10). DSpace digital library software is installed on the server end can be accessed through intranet only. And for slide collection we are using commercial software Libsys 7 which can be accessed

B) SOFTWARE SELECTION

A large number of open source software's is available on internet such as:

a) Greenstone: This software is for building and distributing digital library collection. New Zealand Digital Library Project at the

University of Waikato has developed and distributed in cooperation with UNESCO and the Human Info NGO. It is open source and can handle multilingual documents, with search and browse facility under GNU General Public License.
http://www.greenstone.org

b) E-Prints: It is the largest and widely distributed, installed software developed by the University of Southhampton, with minimum technical expertise. By its integrated advanced search, extended metadata and other features, the software can be customized to local requirement. (http://www.eprints.org)

c) CDSware (CDS Invenio): CDS Invenio formally known as CDSware developed and maintained by the CERN (The European Corporation for Nuclear Research); supports the electronic preprint servers, online library catalog and web repository of different format.
http://cdsware.cern.ch

d) DSpace: It is the joint effort of MIT (Massachusetts Institute of Technology) and HP (Hewlett Packard)in order to mange the digital content of intellectual output in a organization. This software supports digital preservation, planning and managing institutional repository in a large organization. (http://www.dspace.org)

e) Fedora: (Flexible Extensible Digital Object Repository Architecture) maintained by the Dura- Space not for profit organization. Originally this software was developed by the Cornell University. It is the robust open source software which provides core repository services like expressing the digital objects asserting the relationships and linking behavior. (http://www.fedora-commons.org)

SCOPE OF THE DIGITAL LIBRARY IN IGNCA

The library resources are of heterogeneous in nature apart from the format also. The IGNCA information system has played a major role in delivering the contents efficiently and effectively to the desktop of users through intranet and internet through out the India.

In order to well aware about the rare collection of eminent personality; the IGNCA decided that they should go for a Pilot project under which nearly 2800 Rare Books, received either on CDs or DVDs which are already digitized with best quality scanner and then converted into searchable PDF format; need to be upload in digital repository with can be which can be retrieved by the date, title, and keywords in full-text.

Contrary to this; IGNCA further decided to link the slides collection nearly 1 lakhs which are on DVD to the commercial software Libsys 7.

IGNCA DIGITAL LIBRARY

To build the digital repository in IGNCA DSpace is chosen for a number of reason a) available as an open source license, i.e. they are available for free and can be downloaded, customized as per the institutional requirement and can be upgraded, b) Comply with the latest version of OAI metadata harvesting protocols which helps in global participation across the various networks.

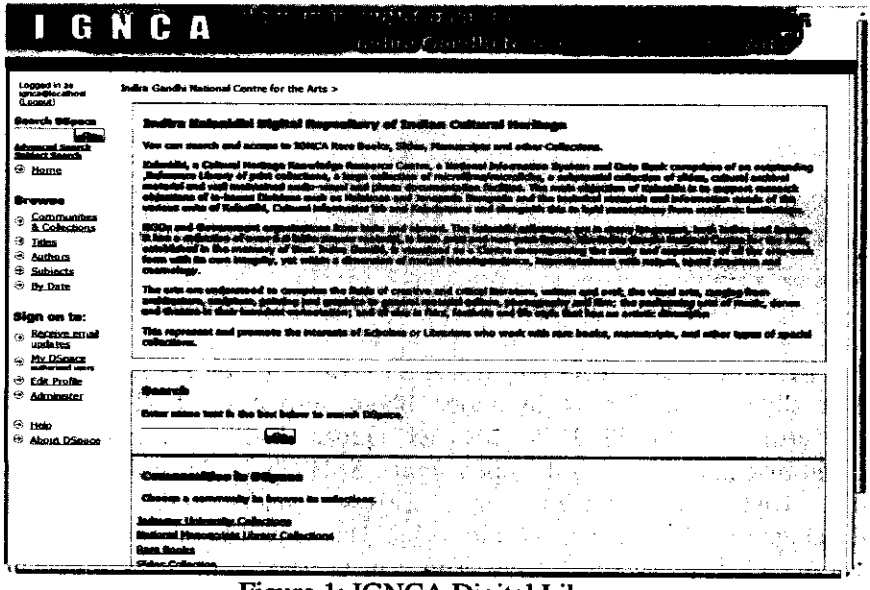


Figure 1: IGNCA Digital Library

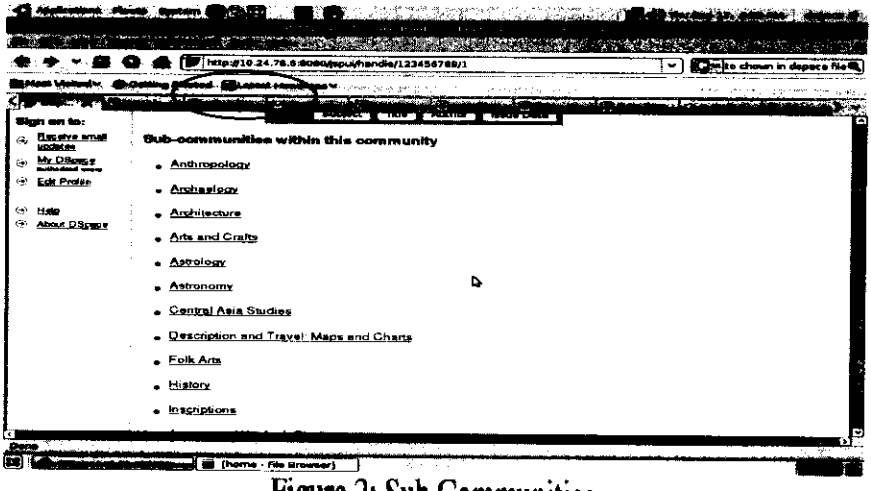


Figure 2: Sub Communities

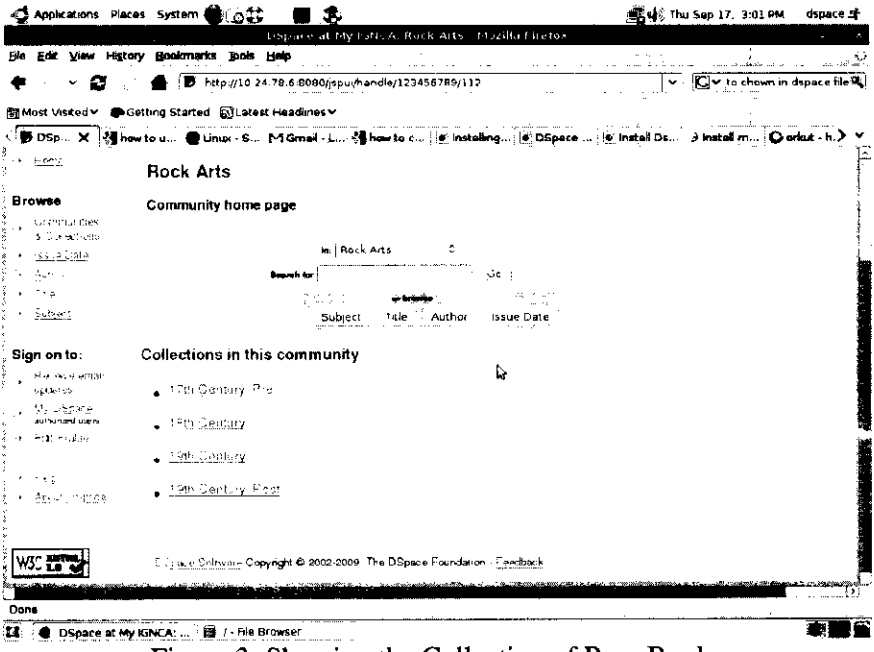
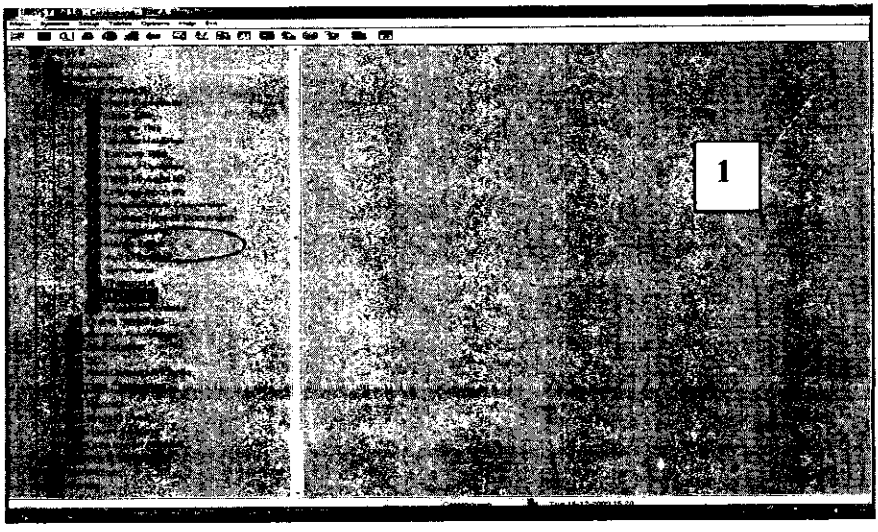
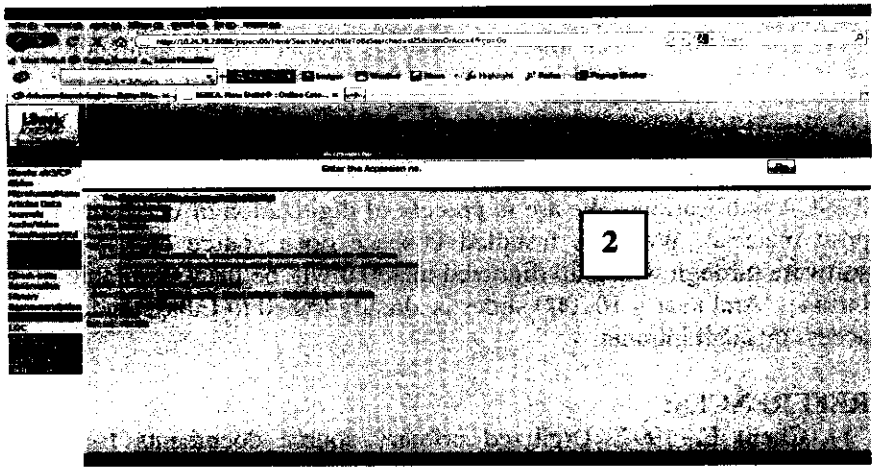


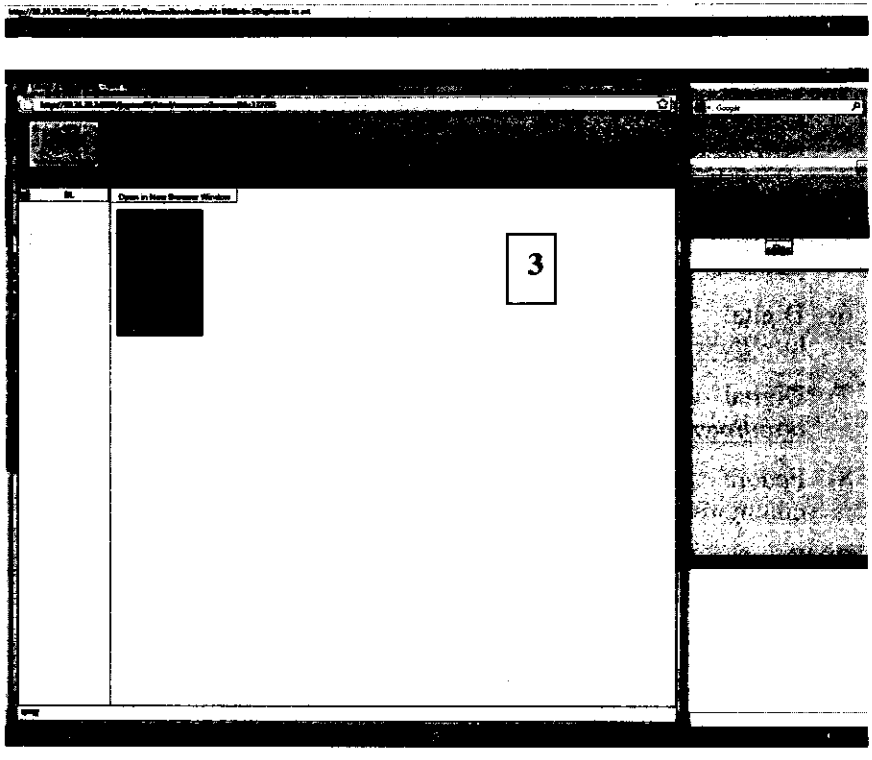
Figure 3: Showing the Collection of Rare Books

LINKING AND ACCESS OF SLIDES COLLECTION TO LIBSYS-7

The slides collection is in adobe photo format on DVD so after converting it into JPEG/JPG files are uploaded to server through the client machines by using the open source SSH Client. Then the file title or URL is linked in Libsys under the module Cataloging→Maintenance→Multimedia. The same file can be retrieved via Web OPAC of the Libsys. This can be shown in the subsequent figure.







CONCLUSIONS

Digital archives are beneficial to all researchers, scholarly institutions, and the entire research community. Major benefits include: cost saving,

avoiding duplication of effort, broadening of the communication process, reduction in time in announcing findings, expansion of audience, and above all preserving information assets for the use of future generations.

At IGNCA we have already digitized about half of our non print material i.e. one lacs slides and nine thousand microfilms, audio-video and IGNCA publications. We are in process of digitization of our entire non-print material. We have installed D-space open source digital library software through which all digitized material will be made available over Intranet. And nearly 10, 000 slides is already linked to Libsys and can be access through intranet.

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Digital Libraries: An Overview

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ABSTRACTS

The paper stresses the purpose, problems and manpower for using digital libraries. Intellectual property right, issues in copyright protection of databases, issue of downloading. Further emphasizes tomorrow's digital libraries and its expected development for the future and also explain how the librarian should be in the age of digital libraries.

INTRODUCTION

The concept of digital library is not merely equivalent to a digitized collection with information management tools. It is rather an environment to bring together collections, services and people in support of the full lifecycle of creation, dissemination, use and preservation of data, information and knowledge. There is no single definition for digital libraries. From the information management point of view, digital libraries are systems that combine the machinery of digital computing, storage and communication, the content and software needed to reproduce, emulate and extend the services of collecting, cataloguing, finding and disseminating information offered by traditional libraries based on paper and other materials. From the user point of view, the digital libraries are systems that provide a community of users with coherent access to a large, organized repository of information and knowledge.

DESIGNING OF DIGITAL LIBRARIES

Digital libraries are organized collections of digital content made available to the public. The content is material that has either been digitized (copies of books and other documents) or that was initially produced in digital format.

There are three priority areas in which the potential of digital technologies is to be exploited to widen access to information:

- Online accessibility;
- The digitization of analogue collections;
- The preservation and storage of digital content.

Although metrics for traditional libraries such as precision and recall can be directly applicable to some aspects of a digital library and have been widely accepted, the ditital library is much more complex and there is much more to be considered. Metrics are required to deal with issues such as the distributed nature of the digital library, the importance of user interfaces to the system and the need for systems approaches to deal with heterogeneity among the various components and content of the digital library.

The digital libraries are not a bounded, uniform collection of information. There will be increasing diversity of information and service providers. There is more that, just searching in digital libraries. The main activities of users can be classified into five categories:

1. Locating and selecting among relevant sources,
2. Retrieving information from them
3. interpreting what was retrieved
4. Managing the filtered-out information locally and
5. Sharing results with others

Users will be involved in multiple tasks at the same time. They will need to move back and forth among these tasks and among the five areas of activity. They need to find, analyse and understand information of varying genres. They need to reorganize the information to use it in multiple contexts and to manipulate it in collaboration with colleagues of different backgrounds and focus of interest.

The infrastructure for digital libraries should include the following components:

1. Shared information representation models, service representation models, and access protocols: These will facilitate the sharing of information and service across digital libraries.
2. Information content sharing agreements: This will take the form of communities of organizations that agree to share their collections. Initially, the sharing may be free, but eventually the community will institute common charging schemes. The communities will also provide rules for having additional members join.

3. Resource directories: the infrastructure should describe available information resources and relative models and protocol and characterize the contents.

4. Coordination forum: The goal of this forum is to coordinate national research and development activities.

In a digital library, there are various items such as people, computers, networks, repositories, databases, search engines, web servers, digital objects and many more. To keep track of these items, a systematic approach to identification is needed. Handles are a set of general purpose identifies. In the digital library system, handles are used to identify digital objects and repositories.

Digitization of one million books in State Central Libraries, Department of public libraries, Government of Karnataka, Bangalore.

International collaborations involved in a project to digitize one million books and offer them free-to-read on the surface web by 2007, led by computer scientists and librarians at Carnegie Mellon, Million Book Project partners include universities and research institutes; for profit and non-profit organizations; government and government agencies; librarians and archivists; software developers; and commercial publishers, university press, and scholarly associations, involved in copyright permission, digital registry, book acquisition and shipping, scanning, quality control, sustainability, and added-value services.

The Million Book Project is an international collaboration to digitize and provide free-to-read access to one million books on the surface web by 2007. The scanning is being done in India, with labor funded by the respective governments, following preservation-quality standards developed by the Institute for Museum and Library Services (2001) and endorsed by the Digital Library Federation (2002).

Carnegie Mellon School of Computer Science and the University Libraries are providing project leadership, with the full support of the University President and Provost. Provost Mark Kamlet led delegations to India in 2002 to develop and formalize project plans. Raj Reddy, Herbert A. Simon Professor of Computer Science, is responsible for the Project vision and technology.

Problems for handling and using Digital Libraries

There are problems for handling and using this large volume of digitized information, for instance:

- Browsing on the electronic form is difficult when compared to printed form
- Remote access to documents is uncomfortable to spot access

- Disappearance of nascent information on the Internet.
- Some documents are used only when it is seen
- Inadequacy of the libraries to predict the future use of documents, irrespective of the form (printed/electronic).
- Navigation (locating) the information on the Internet is difficult.
- Compatibility and standardization problems are likely to be faced due to the use of a variety of hardware, software, storage and retrieval methods.
- A problem frequently encountered and difficult to overcome will be the one of copyright and intellectual property issues.
- The unrelenting invasion of the 'Viruses' will pose another ethical risk.
- 10 Problem of health hazards associated with the use of computer e.g. eye and back problems in particular as well as the exposure to radiation from computer monitors, although in small doses.

Manpower for handling and using Digital Libraries

Rapid growth in information resources in electronic form may greatly reduce the value of the library but it may greatly increase the value of the librarian. The magnitude and diversity of the electronic resources available will place skilled information specialists in great demand. Those information specialists will be needed to:

1. Act as information consultants, pointing people in the direction of sources
2. Train people in the use of electronic information sources
3. search sources that are unfamiliar to particular users
4. Assists in the construction of effective user interest profiles for use with online SDI facilities
5. Assist in the organization of personal electronic information files
6. Keep researchers up to date in new information sources and services as these become available.

The availability of information in electronic format has implications on part of the library staff. As the electronic information systems expand, the staff needs to adapt to new technologies and have to possess skills to handle them efficiently and effectively.

INTELLECTUAL PROPERTY RIGHT

Intellectual property right is a general term which covers copyright, patents, registered designs and trade marks. It also covers layout designs of integrated circuits geographical indicators and anticompetitive policies

in contractual licenses. Copyright stands for the legal rights exclusively given for a definite period of time to the originators (authors or creators) of intellectual work such as a publication, or an artistic or a literary work for sale or any other use. Copyright provides the creators (like writers, poets, composers etc.) of literary or artistic works rights of ownership on their works and legal protection against unlawful reproduction. Although, copyright is generally understood as a right or license to free copying of an existing work, in reality it is not so; rather it is legal right to prevent others from copying.

Issues in copyright protection of databases

Digital Agenda

A work is copyrightable if described as being fixed in a tangible medium of expression when its embodiment in a copy or phonorecord is sufficiently permanent or stable to permit it to be reproduced, or otherwise communicated for a period of more than transitory duration. In other words, if a work is created on a word processor so that it is projected briefly on screen or captured only momentarily in the memory of a computer that works is not fixed and cannot be protected by copyright.

There is a view that taking a database and simply rearranging the data and creating something new is not infringement of the original database copyright. The other view is that, now a day, the data in a database are not placed in the computer memory in any particular order and is simply available for retrieval; so the rearrangement of data implies an infringement of the original database. Another view states that if there was no skill in selecting the individual items that go in a compilation of database and if there is no skill involved in the arrangement (no addition of keywords or indexing terms, simply a listing), then such a compilation should not justify copyright protection.

Issue of Downloading

Databases are treated-whether in online form, CD-ROM form, or any other form- as standard copyright works. Such compilations should not be downloaded or copied in any other way without prior permission (except for small portions only for fair use purposes such as research or private study). They should not be distributed through local or wide area networks to multiple key stations without prior permission. "Downloading" is the electronic transfer of information from one database to another including that from an online database service through one's own local microcomputer. The key issue is whether downloading should be permitted. The issue is not settled. One view is to work out ways to pay reasonable for the use and reuse of the information resource in case downloading is permitted, while others oppose it.

Remote access through telecommunication links is also becoming important for commercial online database. This technology gives users remote access to a database stored in a central computer system. There are copyright issues involved in transmission of data through satellites which are not yet settled.

Libraries of Tomorrow

Peter Drucker foresees the 21st century as the age of social transformation, in which knowledge and not labour or raw material or capital are the key resources forming the foundation of KNOWLEDGE SOCIETY. Education is envisaged as the core of the knowledge society. Librarians as knowledge based workers can conveniently place themselves in strategic position of much significance. In order to make it possible, the librarians shall have to re-orient themselves as highly specialized managers. The present day 'garbage-in and garbage-out' principle of library science education shall not do. Librarian in order to be successful in future shall have to be an integral part of an organization. Especially in developing societies like India, the essence of management shall be to make knowledge productive.

21st century will be the age of creativity. The paperless society is round the corner, whether we like it or not. There is sure indication that the conventional paper based documents would vanish from every-day life. The substitutes for paper, viz, the microforms are not popular yet, because of the inconvenience one has to suffer while using a microform reader. With the advent of packet-held video units, one would, hopefully, be more comfortable. The Japanese have already introduced wrist watch TVs and therefore, a paperless situation is not far away. Now it is the time for various responsible organizations to study its various technical implications in order to meet the challenges of the paperless society towards the end of 20th century.

Expectations for the future

Following are some expected developments for the future:-

1. Users will become more accepting of the technology and make more incidental use of communication of tools of the network;
2. Workstations will continue to become more powerful and more user friendly;
3. Networks will push the current limits on bandwidth leading to more user friendly graphic interfaces. There will be new ways to support the networks, such as cable and there will be a continued growth in numbers of computers linked;

4. High Level IT Task Force has been set up to make India a significant player in IT and software exports.

The Librarians (or Cybrarians) in the age of Digital Libraries are expected to be:

1. Enhanced service providers in a proactive manner.
2. Master of copyright, licensing and electronic redistribution regimes
3. Coordinators working with various specialists overseeing information infrastructure
4. Skilled organizers of knowledge resources including training of staff and end-users
5. Librarians have a role to play as well established organizers of information
6. Librarians have a role as advisors and helpers in the information gathering process which will be in more demand than ever
7 Librarians should maintain awareness of the potential ot new IT products
8 Librarians should continue to introduce innovative technology to improve services and facilities
9. Librarians should incorporate the need for increased speed into their strategies by streamlining their activities and minimizing access procedures
10. Librarians should provide users with system that deliver information as quickly as possible with the minimum of effort.
11. Librarians may need to made provision for users to plug portable devices into library networks
12. Librarians may need to provide multifunctional terminal for users.

CONCLUSION

It has been predicted that by the end of the decade, all information in some disciplines will be available electronically, at which time the virtual library in its fullest form will be a reality. Librarians will assume the role of knowledge managers and will be involved in the development of instructional strategies which will facilitate the productive use of the virtual library. One can safely say that the librarians will assume the management role than an operational role. Moving towards the first decennial of 21st century, information specialists and information managers will need to focus their skills on the electronic highways-weeding, sorting, collating, organizing-to allow greater access and use of

relevant, key information. Instead of string searching to PCs and networks, there will be a new turn in the organization of information.

To conclude, the challenge is neither a 'paperless society' nor the 'electronic information centre'. The challenge is to maintain, nurture and optimize the resources of the libraries with the help of new technology. Hence, we must be ready, emotionally, professionally and financially to accept and make good use of new technology.

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Digital Preservation: Iranian Experience

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ABSTRACT

Keywords: Digital Preservation, Strategies, Issues, Iran, India, Europe

INTRODUCTION

'Digital preservation' or 'digital archiving' essentially aims at taking steps to ensure the longevity of electronic documents. It applies to the documents that are either born Digital", stored on-line or available on CD-ROM, diskettes and other physical carriers and for the product converted from analogue-to-digital, if long-term access is intended. From time immemorial libraries have been the store house of knowledge and called the temples of learning. One of the main functions of the libraries is preservation of their collection for posterity. The present age, which is aptly called the 'Digital Age', has revolutionized the important function of the libraries i.e., the 'Preservation Function'. Digitization is the main technique which has facilitated preservation, which in its modern connotation is called 'Digital Preservation'.

DIGITAL PRESERVATION: SOME DEFINITIONS AND CONCEPTUAL FRAMEWORK:

In the present age, rapid developments of information technology and communication systems have brought about revolutionary changes in the organization and management of information. The advance application of information technology has touched each and every activity of library and information centre. Now information technology brings a unique opportunity to the field of preservation, with the digital preservation facility of non digital documents[8].

Encyclopedia of Information Technology[1] defines the term digital preservation as "The process of maintaining, in a condition suitable for use, materials produced in digital formats. Problems of physical preservation are compounded by the obsolescence of computer equipment, software and storage media. Also refers to the practice of digitizing materials originally produced in non digital formats (print, film

etc.) to prevent permanent loss due to deterioration of the physical medium." Conway (2008)[3] describes Preservation is currently in a state of flux, confronting profound challenges and opportunities in the face of mass digitization of cultural heritage. The Oxford English Dictionary defines the adjective "tectonic" as referring to a change; momentous, utter, vast; chiefly in tectonic shift." By inserting the letter "h" in the word "tectonic," the technological horns of the dilemma - technology as a potent threat to the core principles of the library profession versus technology as an alluring tonic - is brought to attention. The dilemma is most pronounced in the face of the wholesale digitization of cultural heritage. The author discusses the impact of mass digitization on preservation and the mitigating factors for preservation leadership.

Caplan (2007)[2] has worked for ten years in the field of digital preservation for cultural heritage institutions. The author describes the experience of a practitioner in digital preservation. Digital preservation has become a mainstream activity. There are differences in the American and European approaches to supporting and organizing preservation initiatives. US institutions would benefit from wider outreach and education efforts. The implications are left to the reader, but may suggest that more reflection on the goals and strategies of the preservation community is in order. The author identifies a need to develop and support distributed centres of excellence to promote digital preservation, provide expertise to other institutions, and to organize sharing and training opportunities for their constituencies.

Natarajan (2004)[9] define the term digital preservation and presented the requirements for preservation. The need required for preserving digital objects and the characteristics are discussed with the preservation requirements and storage considerations. The technical issues like intellectual property rights (IPR), societal and legal issues, access issues and policies, quality control, financial issues and human resource management etc. are also discussed in detail. Limitations and standards for the digital preservation are given at the end of the article.

BENEFITS OF DIGITAL PRESERVATION

Following are the some of the benefits of digital preservation:

- Reproducing multiple digital copies and by putting them for use the originals can be protected.
- Dissemination of Information: Cultural heritage available in museum, libraries, and religious institutions.
- Transcend Originals: Digital imaging helps to create a product that can be used for purposes that are impossible to achieve with original resources.

- Collection Management: By digital preservation one can catalogue, research and assist with utilization of available materials.
- New Revenue Streams: By making available digital reproductions at lower resolution to scholars as a paid service or sale of high quality posters to art patrons around the world via an e-commerce web site it is possible to generate additional revenue[11].

STRATEGIES FOR DIGITAL PRESERVATION

A number of preservation strategies will be required to ensure permanent access to digital materials. The choice of which strategy to use will depend on the nature of the digital publication and also on the requirements of the users. Some of the strategies through which digital publication and also on the requirements of the users. Some of the strategies through which digital preservation can be achieved are as under:

- Intellectual Preservation
- Technology Preservation
- Refreshing
- Data Migration
- XML (Extensible Mark-up Language):
- UVC (Universal Virtual Computer):
- Emulation
- Encapsulation:

ISSUES RELATING TO DIGITAL PRESERVATION

Now many publications it may be general or scholarly communication are published and presented in electronic, digital and online format with multimedia capability. The followings are some of the issues are listed as per as Digital Preservation at Iranian Experience.

- Ownership Issues
- Fragility of the Media and Technological Obsolescence
- Fragility of the Integrity of Digital Information
- Copyright and Intellectual Property Right (IPR)

DIGITAL PRESERVATION IN INDIA: BRIEF REVIEW

PROFILE:

Thiyam Satyabati (2008)[14] says manuscripts are one of the precious materials of our cultural heritage, acting as a valuable source of history and knowledge and offering perspective on contemporary society. In Manipur, they are losing the manuscripts through decay and improper handling. Current progress in the field of information and communication technology offers a potential solution to the problem.

Through large scale digitization projects, manuscripts can not only be stored and preserved, but also made available to the public. Kaur (2007)[6] says that, today, most of the cultural and heritage materials are being converted into digitized forms to provide immediate accessibility anywhere in the world. But due to obsolescence of formats, hardware, software and carriers, digital information will be lost unless we act. Hence preservation of digital materials for the benefit of present and future generations is an urgent issue to address. The paper explores various strategies and methodologies for preserving digital heritage materials; discusses issues concerning digital preservation (DP); enjoins upon the national libraries to take the responsibility for DP with the co-operation of several stakeholders - the Government, publishers and IT industry; gives an overview of initiatives taken by the national libraries world-wide for preserving digital heritage materials; and discusses Indian scenario. It also focuses on the pressing need for the national library, state libraries, museums and libraries to work together more closely to successfully organize digital archiving in the 21st century.

Thinking the importance of digital preservation, in India too, numbers of projects are taken by different organizations for the preservation of these valuable manuscripts in digital format. In July 2000, a pilot project for digitization of rare manuscripts had been initiated by National Archives of India, collaboration with Department of Science and Technology and National Institute of Advanced Studies, Bangalore. Under this project, rare manuscripts, viz. Bhagwadgita, Ramayana, Mahabharata, etc. Have been digitized and stored in CD medium. National Library of India, Kolkata is the apex body of library services India. This National Library has about 3600 rare and historically important manuscripts in different languages. These manuscripts are preserved separately in the Rare Books division. This Library has initiated a digitization programme, known as 'Down the Memory Lane', to digitize these manuscripts along with other rare books and documents are archived on CDs. Between the year 1999 and 2001 approximately 6601 books and manuscripts containing 2.5 million pages were scanned and archived in 548 CD- ROMs. Established in 2001, Nanakshahi is a registered trust at Punjab for creating a comprehensive Digital Sikh Reference Library. This trust introduced a Project named Virsa under which one hundred fifty manuscripts of Sri Guru Granth Sahib and other manuscripts available in the Government Museum and Art Gallery, Chandigarh and Kurukshetra University are digitized. In February 2003, the Department of Culture, Ministry of Tourism and Culture, Government of India Lunched a national level mission for the preservation of the manuscripts India's real treasure of culture. The Mission has laid emphasis, on digital preservation of rare manuscripts all over India and already completed a number of manuscripts are captured in digital form. Further the Indira

Gandhi National Centre for Arts (IGNCA) was launched on 19th November, 1985 by the late Prime Minister of India Shri Rajiv Gandhi and registered at New Delhi on 24th march 1987. This Centre has taken a nationwide project for digital preservation of manuscripts. This Centre is digitizing number of manuscripts in Assam also. Khuda Bakhsh Oriental Public Library located in Patna, Bihar has taken a pilot Project of Digitization of Manuscripts in October, 2005, which has a mighty collection of about 21,000 manuscripts in Arabic, Persian, Urdu, Turkish, Hindi and Sanskrit written on Palm- Leaves[8].

DIGITAL PRESERVATION IN INDIA: BRIEF REVIEW PROFILE

Shadanpour (2008)[12] says that the emergence and widespread use of computer technology and networking caused creation of new forms of information sources, and significant changes in techniques, methods, and methodologies of collection, preservation and dissemination of these sources. National libraries and national archives, as the main bodies in charge in this area, are facing great challenges. In dealing with these challenges, what can? Lead to reasonable and useful actions are the right perception of the world conditions and progresses, as well as logical, realistic and futuristic managerial and technological approaches. Some of the dimensions of this issue are dealt with in this article with an eye on what has been done by the National Library and Archives of Iran?

Niknam (1991)[10] discuss the state-of-the-art of conservation, preservation and restoration in Iran focusing on activities in the following institutions: Astan Qouds Razavi Central Library in Mashhad; the National Archive of Iran; the Cultural Heritage Organisation; and the National Library of Iran.

Gholamhosseinzadeh (2007)[5] presents the use of information technology and digitalization and how it has made changes in various fields for several years. The aim of this research is to study how Information Technology (IT) is used in storing and retrieving the manuscript copies in the libraries of Iran. The findings of research show that 60% of libraries have digitalized their manuscript copies and there are only two libraries that have computerized 100% of the information regarding its manuscript copies. Among all of these libraries, libraries of Ghom city stood in a more distinguished position than other cities of the Country in using information technology and digitalization of manuscript copies. Also the results show that it is evident that the libraries under study lack sufficient specialized staff and have problems with location of library and also quality of using information technology.

INITIATIVES IN DIGITAL PRESERVATION OF MANUSCRIPTS IN IRAN

One of the major functions of the National Library of a country is to collect and preserve nation's intellectual and cultural heritage. Therefore National Library has taken several steps to preserve this heritage as well as to increase the accessibility and awareness of these records. National library and national archive established in 1973 in Tehran. These libraries have good collection such as Books: 1/4 million volumes, Periodicals: 2500, over 5000 titles of old periodicals are cited in the archive, Non-book, resources: 150000, Manuscripts: 18,000, Lithographic books: 13000vol, Handwritten Documents: one million.

Astan Quds Razavi Library established in 1430 in Mashhad. Collection is such as Books: 1100291 Vol, Manuscripts: 46596, Periodical: 1546, electronic audio Visual: 35952, Manuscript Microfilm roll: 34726 Map: 1800.this library also has good collection of rare material and manuscript and started digitizing the collection.

TRENDS IN DIGITAL PRESERVATION

The significant growth over the last couple of years in knowledge and experience of collecting and managing digital resources has been accompanied by an ever-bigger escalation in research into digital preservation issues. Research in this area is now on a much larger scale and better coordinated than a few years ago and general agreement is starting to emerge on the nature of the problems that need to be addressed and on approaches to dealing with them.

National Digital Information Infrastructure and Preservation Program (NDIIPP) One of the biggest and best known digital preservation projects underway is the National Digital Information Infrastructure and Preservation Program (NDIIPP) (http://www.digitalpreservation.gov/about/index.html) which is being led by the Library of Congress. NDIIP is a collaborative strategy involving government and non-government entities that received just under $100m funding from the US Congress in late 2000. Its broad goal is to provide a national focus on important policy, standards and technical components necessary to preserve digital content. The NDIIPP plan will be implemented over several years and result in recommendations to the U.S. Congress about the most viable and sustainable options for long-term preservation. In the last two years several partnerships have been entered into to pursue the program goals. For instance, in May 2005 NDIIPP, in partnership with the National Science Foundation, launched a digital preservation research grants program by awarding 10 universities a total of $3 million to undertake pioneering research to support long-term management of digital information.

Digital Preservation Europe (DPE) A new European digital preservation initiative that was established in April this year is Digital Preservation Europe (DPE). DPE "fosters collaboration and synergies between many existing national initiatives across the European Research Area." It "addresses the need to improve coordination, cooperation and consistency in current activities to secure effective preservation of digital materials." (http://www.digitalpreservationeurope.eu/). The APSR project recognizes that modular solutions rather than stand alone ones are required. It is making links with related projects such as the Global Digital Format Registry (http://hul.harvard.edu/gdfr/) so that appropriate tools can be plugged into its architecture, and replaced if necessary without destroying the entire system. The final report of the PREMIS Working Group is available from the project's website (see above.) Its products, which include a data dictionary for preservation metadata and examples of use cases, and XML schema for the elements in the data dictionary, are available for downloading. A maintenance process for the data dictionary and XML schema, hosted by the Library of Congress has been organized[4].

CONCLUSION

Digital Preservation is not a one-off activity; the variety of continuing threats and challenges, as mentioned in this paper, must be addressed. This paper has expanded on issues, strategies, and benefits of digital preservation and also described the activities done in Europe, India, Iran. Finally it describe about the initiative works that done in Iran and India.

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Digital Preservation

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ABSTRACT

Digital Preservation is the management of digital information over time.Preservation of Digital Information is widely considered to require more constant and ongoing attention than preservation of other media. This constant input effort, time, and money to handle rapid technologies and organizational advance is considered the main stumbling block for preserving digital information. The Digital information created merely a decade ago is in serious danger of being lost. Digital Preservation can therefore be seen as the set of process & activities that ensure continued access to information and all kinds of records, Scientific and cultural heritage existing is digital formats. Preservation no longer just the product of a program but an ongoing process. In this regard the way digital information is stored is important in ensuring its longevity. The purpose of preservation is to ensure protection of information of enduring value for access by present & future. Libraries have served as the central institutional focus for preservation.

INTRODUCTION

Digital Preservation is a set of activities required to make sure digital objects can be located, rendered, used and understood in the future. This can include managing the object names and locations, updating the storage media, documenting the content and tracking hardware and software changes to make sure objects can still be opened and understood. Preservation of Digital materials are of increasing importance for a wide range of activities with in education and research. Much of the knowledge base and intellectual assets of institutions and

staff are now in digital form. Unless a significant effort is put urgently into digital preservation and securing long term access to these digital resources. In addition unless digital assets can be preserved overtime, current investment in digitization and digital content will only secure short-term rather than lasting benefits.

DEFINITIONS

- Digital preservation is defined as long-term, error free storage of digital information, with means for retrieval and interpretation, for the entire time span of the information is required for long-term is defined as long enough to be concerned with the impacts of changing technologies, including support for new media & data formats.
- Digital Preservation is defined as "long enough to be concerned with the impacts of changing technologies, including support for new media and data formats or with a changing user community.

GOAL

The goal of Digital Preservation system is that the information it contains remains accessible to users over a long period of time. The key problem in the design of such systems is that the period of time is very long, much longer than the lifetime of individual storage media. hardware and software components and the formats in which the information is encoded. If the period were shorter, it would be simple to satisfy long-lived media embedded in a system of similarity long lived hardware and software. No media, hardware and software exists in which longevity designers, can place such confidence. They must therefore anticipate failures and obsolescence.

LONG TERM DIGITAL PRESERVATION

- "five years or more"
- "a period of time long enough for there to be concern about the impacts of changing technologies, including support for new media and data formats, and of a changing user community, on the information being held in a repository. This period extends into the indefinite future."
- "Data should normally be preserved and accessible for not less than 10 years for any projects, and for projects of clinical or major social, environmental or heritage importance, the data should be retained for up to 20 years, and preferably permanently within a national collection, or as required by the funder's data policy.

NEED TO PRESERVE

Various aspects of the digital objects may be needed to be preserved.

- The lowest level of preservation requirements includes preservation of the bit stream, this does not however ensure understandability, readability or usefulness of the digital object. Another aspect is that, even for users within the same sub-discipline, terminology drifts and meaning is lost; users in different (sub)disciplines will require even more help with the semantics of the data.
- A more complex approach may strive to preserve not only the 1s and 0s but also the meaning so that it remains readable and understandable. Such an approach requires the preservation of additional information (representation information, technical metadata etc.)
- Even more ambitious preservation approaches try to preserve understandable content in such a way that the provenance and source of the digital object also remains clear. Thus the users can have trust that the object is authentic, accurate, complete etc.

BENEFITS OF DIGITAL PRESERVATION

Legal

National legal frameworks often require organisations to provide adequate records of business processes, communications and many other types of data for many years after their creation.

Accountability & protection from litigation

Recent legal cases have shown the importance of being able to search and recover archived emails quickly and in a legally admissible manner.

Protecting the long term view

Access to digital data is critical to ensure business continuity and to support decision making with a long term view. For research in particular preserving data may be crucial for identifying long-term trends.

Protecting investment

The valuable intellectual assets of organisations are increasingly in digital form. This data represents both intellectual property and a considerable investment of time, effort and money. It would therefore be foolish not to protect and preserve these assets adequately.

Reuse

Repositories of digital information and the tools to mine, analyse and re-purpose them represent a society's intellectual capital. Effective and affordable digital preservation solutions are essential to transfer digital data into valuable assets for business.

DIGITAL PRESERVATION STRATEGIES

In 2006, the Online Computer Library Center developed a four-point strategy for the long-term preservation of digital objects that consisted of:

- Assessing the risks for loss of content posed by technology variables such as commonly used proprietary file formats and software applications.
- Evaluating the digital content objects to determine what type and degree of format conversion or other preservation actions should be applied.
- Determining the appropriate metadata needed for each object type and how it is associated with the objects.
- Providing access to the content

There are several additional strategies that individuals and organizations may use to actively combat the loss of digital information.

Refreshing

Refreshing is the transfer of data between two types of the same storage medium so there are no bit rate changes or alteration of data . For example, transferring census data from an old preservation CD to a new one. This strategy may need to be combined with migration when the software or hardware required to read the data is no longer available or is unable to understand the format of the data. Refreshing will likely always be necessary due to the deterioration of physical media.

Migration

Migration is the transferring of data to newer system environments (Garrett et al., 1996). This may include conversion of resources from one file format to another (e.g., conversion of Microsoft Word to PDF or Open Document), from one operating system to another (e.g., Windows to Linux) or from one programming language to another (e.g., C to Java) so the resource remains fully accessible and functional. Resources that are migrated run the risk of losing some type of functionality since newer formats may be incapable of capturing all the functionality of the original format, or the converter itself may be unable to interpret all the nuances of the original format. The latter is often a concern with proprietary data formats.

The US National Archives Electronic Records Archives and Lockheed Martin are jointly developing a migration system that will preserve any type of document, created on any application or platform, and delivered to the archives on any type of digital media. In the system, files are translated into flexible formats, such as XML; they will therefore be

accessible by technologies in the future. Lockheed Martin argues that it would be impossible to develop an emulation system for the National Archives ERA because the volume of records and cost would be prohibitive.

Replication

Creating duplicate copies of data on one or more systems is called *replication*. Data that exists as a single copy in only one location is highly vulnerable to software or hardware failure, intentional or accidental alteration, and environmental catastrophes like fire, flooding, etc. Digital data is more likely to survive if it is replicated in several locations. Replicated data may introduce difficulties in refreshing, migration, versioning, and access control since the data is located in multiple places.

Emulation

Emulation is the replicating of functionality of an obsolete system. Examples include emulating an Atari 2600 on a Windows system or emulating WordPerfect 1.0 on a Macintosh. Emulators may be built for applications, operating systems, or hardware platforms. Emulation has been a popular strategy for retaining the functionality of old video game systems, such as with the MAME project. The feasibility of emulation as a catch-all solution has been debated in the academic community (Granger, 2000).

Raymond A. Lorie has suggested a Universal Virtual Computer (UVC) could be used to run any software in the future on a yet unknown platform. The UVC strategy uses a combination of emulation and migration. The UVC strategy has not yet been widely adopted by the digital preservation community.

Jeff Rothenberg, a major proponent of Emulation for digital preservation in libraries, working in partnership with Koninklijke Bibliotheek and National Archief of the Netherlands, has recently helped launch Dioscuri, a modular emulator that succeeds in running MS-DOS, WordPerfect 5.1, DOS games, and ***more.***

Metadata attachment

Metadata is data on a digital file that includes information on creation, access rights, restrictions, preservation history, and rights management. Metadata attached to digital files may be affected by file format obsolescence. ASCII is considered to be the most durable format for metadata because it is widespread, backwards compatible when used with Unicode, and utilizes human-readable characters, not numeric codes. It retains information, but not the structure information it is presented in. For higher functionality, SGML or XML should be used.

Both markup languages are stored in ASCII format, but contain tags that denote structure and format.

Trustworthy digital objects

Digital objects that can speak to their own authenticity are called *trustworthy digital objects* (TDOs). TDOs were proposed by Henry M. Gladney to enable digital objects to maintain a record of their change history so future users can know with certainty that the contents of the object are authentic. Other preservation strategies like replication and migration are necessary for the long-term preservation of TDOs.

DIGITAL PRESERVATION STANDARDS

To standardize digital preservation practice and provide a set of recommendations for preservation program implementation, the Reference Model for an Open Archival Information System (OAIS) was developed. The reference model (ISO 14721:2003) includes the following responsibilities that an OAIS archive must abide by:

- Negotiate for and accept appropriate information from information Producers.
- Obtain sufficient control of the information provided to the level needed to ensure Long-Term Preservation.
- Determine, either by itself or in conjunction with other parties, which communities should become the Designated Community and, therefore, should be able to understand the information provided.
- Ensure that the information to be preserved is Independently Understandable to the Designated Community. In other words, the community should be able to understand the information without needing the assistance of the experts who produced the information.
- Follow documented policies and procedures which ensure that the information is preserved against all reasonable contingencies, and which enable the information to be disseminated as authenticated copies of the original, or as traceable to the original.
- Make the preserved information available to the Designated Community.

OAIS is concerned with all technical aspects of a digital object's life cycle: ingest into and storage in a preservation infrastructure, data management, accessibility, and distribution. The model also addresses metadata issues and recommends that five types of metadata be attached

to a digital object: reference (identification) information, provenance (including preservation history), context, fixity (authenticity indicators), and representation (formatting, file structure, and what "imparts meaning to an object's bit stream". Prior to Gladney's proposal of TDOs was the Research Library Group's (RLG) development of "attributes and responsibilities" that denote the practices of a "Trusted Digital Repository" (TDR) The seven attributes of a TDR are: "compliance with the Reference Model for an Open Archival Information System (OAIS), Administrative responsibility, Organizational viability, Financial sustainability, Technological and procedural suitability, System security, Procedural accountability." Among RLG's attributes and responsibilities were recommendations calling for the collaborative development of digital repository certifications, models for cooperative networks, and sharing of research and information on digital preservation with regards to intellectual property rights.

DIGITAL PRESERVATION INITIATIVES

For more details on this topic, see List of digital preservation initiatives

- **DSpace** is open source software that is available to anyone who has the World Wide Web. DSpace takes data in multiple formats (text, video, audio, or data), distributes it over the web, indexes the data (for easy retrieval), and preserves the data over time.
- The British Library is responsible for several programmes in the area of **digital preservation**. The National Archives of the United Kingdom have also pioneered various initiatives in the field of **digital preservation**. Both use the Safety Deposit Box software from Tessella.
- **PADI** is a comprehensive archive of information on the topic of digital preservation from the National Library of Australia.

Many research libraries and archives have begun or are about to begin Large-Scale digital preservation initiatives (LSDI's). The main players in LSDIs are cultural institutions, commercial companies such as Google and Microsoft, and non-profit groups including the Open Content Alliance (OCA), the Million Book Project (MBP), and HathiTrust. The primary motivation of these groups is to expand access to scholarly resources.

Academic Institutions are beginning to create digital institutional repositories into which the intellectual capital of a college or university can be preserved for reuse—gathering up not just the articles and books of the completed scholarly endeavor but also the data sets, presentations, and course-related materials that faculty generate. As this process moves forward, it becomes obvious that these institutions also need to save

information about the many computer formats in which this mass of material expressed itself.

Currently, the University of Pennsylvania is developing a prototype registry service to test some design hypotheses for a format registry. Fred (Format Registry Demonstration) allows interested parties to contribute, view, and maintain format information. Fred is not itself intended to be the global format registry, but rather a test bed for ideas on how to design, build, and maintain such a registry. For more information see Building a robust knowledge base for digital formats (John Mark Ockerbloom, University of Pennsylvania). And further information on the GDFR Initiative and its participants is available at http://hul.harvard.edu/gdfr/.

NDIIPP and the National Science Foundation (NSF) joined forces to establish a Digital Archiving and Long-Term Preservation (DIGARCH) research program, and awarded $3 million among 10 projects researching the long-term management of digital information. Three projects are led by DLF member institutions. DIGARCH funds cutting-edge research in digital preservation with emphasis on digital repository models; tools, technologies, and processes; and organizational, economic, and policy issues. Projects range from preserving complex data types, like oceanographic data from deep-sea submersibles, to planning for preservation requirements; and from automating metadata capture to creating incentives for creators to deposit with archives. All DIGARCH projects are expected to produce study results in one year.

CONCLUSION

The preservation community has at its disposal a variety of tactics for digital preservation that appear to work effectively for certain types of materials in certain restricted environments, but we have not yet developed solutions that are scalable to the general problem of digital preservation. This is not to suggest that there is or should be a single solution to digital preservation. The methods used will vary depending upon the complexity of the original data objects, the extent to which the functionality for computation, display, indexing, and authentication must be maintained, and the requirements of current or anticipated users. But any solution must be scalable from the laboratory, prototype, or pilot project to the wide range of individuals and institutions who have a need to make digital materials last longer than the current generation of technology permits. From the viewpoint of communication, the digital repository must provide feedback about its policies and technologies, and be open to sharing this information with users. As libraries and other institutions embark on the digital preservation process, judgment must be used to balance risk against the maturity of the process. Documents that are extremely rare or whose loss might cause considerable financial,

environmental, or cultural disasters should not be entrusted to a relatively immature process. We would like to say that we will preserve our cultural heritage materials in perpetuity; however the unknown – and, furthermore, unknowable – digital landscape suggests that any such guarantee would be inadvisable at this point.

Finally, it must be said that there will always remain the element of trust in the organization that takes on the role of "trusted digital repository". We want to have at least this same level of trust in digital repositories. Ultimately, users will need to be able to trust the people and organizations who have taken on the responsibility for managing the processes and technology of digital preservation.

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Digitization of Library Resources: a framework

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ABSTRACT

This article is based on topic "digitization" which is very common now days. Digital preservation is of utmost importance in order to maintain the mission of preserving a record for future use. This paper explores an initiation towards the introduction, definition, need, digital project planning, and hardware for digitization, digitization software, problems, benefits and future of digital preservation.

Keywords: Digital Library, Digital Preservation, Preservation

INTRODUCTION

We are in digital age. Therefore digital library technology is currently the most discussed area in information technology. Information Technology means the application of micro electronic based combination of computing and telecommunication technology for the access, processing, storage, dissemination of information worldwide digital library initiatives are now resulting in form of various digital libraries. At present, digitization of both print as well as non-print material is going at very faster pace in India. Most of information is now "born digital". The large amount of digital contents available in the libraries and archives of various institutions in India need to be digitized for preserving long time. Long term digital preservation have just started getting due attention of the digital library experts worldwide

Digital Preservation includes the preservation of print and non- print material in digitized form for effective and purposeful use. The purpose of preservation is to ensure protection of information of enduring value for access by present and future generations.

Digital preservation is indeed a very challenging task for Library and Information Centre .The future of Library and information services is based on it. The term "Digital Preservation" refers to both preservation of materials that are created originally in digital form and never exist in print or analog form (also called "born digital" and "electronic records") and then use of imaging and recording technologies to create digital surrogates of analog materials for access and preservation purposes.

DEFINITION

Digitization, often referred to as image capture, is the process of creating a digital representation or image of an original artifact through scanning or digital photography.

The Term digitization refers to the process of converting objects and documents such as photograph, manuscripts printed text and artwork in digital form. Technically, it is the process of converting information form a physical format into a digital one. There are two basic kind of digitization.

- Image Capture (eg. Using a camera, scanner or other capture device)
- Information capture (eg. Scanning a document to create electronic text)

Some of the information Scientist and Experts of information Technology defined digital library as follows:

- Digital libraries are libraries in which controlled collections are in digital form and we can access to the information from one place and also transfer to other place through intranet or internet.
- Digital libraries are electronic libraries in which a large number of geographically distributed users can access the contents of large and diverse repositories of electronic objects. Electronic objects include networked text, images, maps, sounds videos, catalogues and scientific business and government datasets.[1]
- Clifford Lynch, a well–known expert on internet and web technologies, has defined a digital library as a "system providing a community of users with coherent access to a large. Organized repository of information and knowledge. The digital library is not just one entry, but multiple sources seamlessly integrated'.[2]

Fox (1998), has defined the digital library as "the new way of carrying out the functions of libraries encompassing new types of information resources, new approaches to acquisition, new methods of storage and preservation, new approaches to classification and cataloguing, intensive use of electronic systems and networks and dramatic shifts in intellectual, organizational and electronic processes."[3]

Keeping in mind of above definition we can say, a digital library is a paperless system and information retrieve through computers or other electronic media. It is a better retrieval and faster communication systems. It is support to multi user's accessibility either on a particular place or remote areas.

NEED OF DIGITIZATION

Digitization requires a long –term commitment of time and resources. The fundamental purpose of digital library must be to provide access to information along with appropriate reference tools for identifying and evaluating the possible sources and types of information.
The major objectives of a digital library are listed as under:

- To collect, store, organize and retrieve digital information.
- To provide coherent view of all information within library in any format.
- To minimize massive storage and space problem in libraries.
- To save the time of library staff by avoiding routine jobs.
- To save the time of the users/ clients.
- To satisfy the user's requirement.
- To reduce cost involved in various library activities.
- Providing better access to unknown or little used collections.
- Offering better search and retrieval faculties for an image collection.
- Enhancing the public knowledge, recognition and understanding of the collection.
- Saving original form wear and tear.
- Back up, long term preservation.

DIGITIZATION PROJECT PLANNING

A project Manger has to be identified to take care of planning and preparing project and execution of the same. Digitization project may include:

- What type of text to be digitized?
- In which format data to be saved? (PDF JPEG, TIFF etc)
- How much quality is needed? (Image, quality, size, time, Artifacts)
- How will people find the digital objects? (Catalogues, Web index)
- Are there any restrictions to using the digital objects (unauthorized users?)

Different data models are implemented using different sets of standards, file formats and software, so it is very important to understand the type of resource you are building before proceeding.

Resource Type	Formats
Texts	XML, TEI, Dublin Core, PDF
Dataset	Relational data model, SQL, XML
GIS	Vector and raster data models, polygon topology, Open GIS standards
Library/Archive Catalogue	XML, OAI, Dublin Core, subject specific metadata schemas (e.g. DDI, VRA Core), XSLT, controlled vocabularies
Website	XHTML, W3C web accessibility standards, database connectivity (ODBC, ADO, JDBC), scripting languages (PHP, Javascript, ASP)
Audio Clips	Lossless compression MP3, sampling rates, bit rate
Still Images	Resolution and colour depth, TIFF, PNG, lossless compression, NISO technical metadata, VRA Core 3.0 metadata, Dublin Core
Moving Images	Compression, MPEG frame rate, resolution and colour depth, screen size, 'codecs'

The material may include digital images, searchable files, structural metadata, and catalogue records. The essential issue for managing a technology based projects are :

- Formal project planning
- Risk and resource management
- Feasibility studies and piloting of the project
- Accurate cost of the project

HARDWARE FOR DIGITIZATION

In the present time, however, we have many hardware equipment available for digitization process. But more attention are to be required for purchasing of scanners, digital cameras and other digitization tools. These devices directly determine the quality of your digital master versions, so care should be taken to compare and test different devices before making a purchase

Some essential hardware equipment are to be required are mentioned here:

- Flatbed Scanner
- Sheet feeders
- Drum Scanners
- Digital Camera

SOFTWARE FOR DIGITIZATION

The creation of digital libraries, Software is the key element in the construction of a Knowledge Repository Digital libraries provide an integrated set of services for capturing, cataloguing, storing, searching, protecting, and retrieving information, which provide a coherent organization and convenient access to typically large amounts of digital information.

Some of the important digital library software is mentioned here

1 ***Archidede***: Software developed by Laval University Library, Canada was designed for electronic preprints and post prints of institution faculty and staff. Archimede was designed to support multilingual institutional implementations, submission process in the intranet environment managed locally by research community .The Archimede institutional repository system manages the university or institution electronic theses and dissertations.

This was developed on a variety of Java open sources technologies, runs on many operating systems and can be installed on an existing technical infrastructure of any institution.

2 DSpace: DSpace was developed in partnership between Hewlett Packard (HP) Laboratories and Massachusetts Institute of Technology (MIT). DSpace depend upon the java programming language and the PostgreSQL open source database system. It also requires a number of additional java based elements to be installed: Tomcat, which is a java Web server. DSpace should be installed on a Linux or Unix machine. The DSpace architecture consists of three layers application layer; business layer and storage layer. DSpace has many administrative options and splits its facilities into two parts: Workflow users and DSpace administration.4

3 E-Prints: It was developed at the University of Southampton with the first version of the software publicly in late 2000. The objective behind the creation of E-Prints was to facilitate open access to peer reviewed research literature but is now used for other material including reprints, technical reports, conference publications or other means of electronic communication. On its website (www.eprints.org) this OSS is described as "a flexible platform for building high quality, high value repositories. It is recognized as the easiest and fastest way to set up repositories of research outputs of literature, scientific data, theses and reports or multimedia artifacts from collections, exhibitions and performances.[5]

4 Fedora: It is jointly developed by the University of Virginia and Cornell University with its first version in 2003.The objective of Fedora was to create a production quality system using a XML and web services to deliver digital content. Fedora supports digital assets management, institutional repositories digital archives, content management system and digital libraries. The system is design to be a foundation upon which full –featured institutional repositories and other web based digital libraries can be built.[6]

5 Greenstone: The Greenstone Digital Library (GSDL) software was developed by the New Zealand digital library project at the University of Waikato and distributed in co-operation with UNESCO and the Human Info NGO. Greenstone is a tool for building digital libraries and aims to empower users particularly in universities, and other public service institutions. GSDL runs under UNIX and Windows platform, it can create files in different formats, e.g. PDF, Postscript, MS-word or ftp. There are five stages in developing a digital library using GSDL:

- Collect information.
- Describe the data.
- Configure the collection.
- Build the collection.

- View the collection.

Greenstone constructs full-text indexes from the document text, and from metadata elements such as title and author. Indexes can be searched for particular words, Boolean combinations, or phrases, and results are ranked by relevance or sorted by a Metadata element.[7]

PROBLEMS IN DIGITIZATION

There are numerous reasons for digitization being costly activity, Some of major problem are:

- Getting copyright Clearance by contacting rights holders takes a long time and is very experience in terms of labour costs.
- Preserving the moral rights of authors is also expensive because this involves accurate. Proof reading of the digitized text to make sure that it does not deviate from the original.
- Reproducing and circling inaccurate copies of a hardcopy original would be to subject that to derogatory treatment.
- Compatibility and standardization problems will arise due to use of variety of hardware software, information collection, and storage and retrieval methods.
- Since electronic information is more easily manipulated and reproduced the identity of the author or change affected to original data is harder to establish.
- Browsing is difficult on digitized form as compared to print from.
- Changing habits in the arena of learning and teaching in the use of information from electronic databases

ADVANTAGES OF DIGITIZATION: Some of the key benefits are:

- ***Increased accessibility of resources*:** we can increase accessibility of resources because the user of digital library need not go to the library physically. People from all over the world may access to the same information using internet connection.
- ***Round a clock availability:*** Digital libraries can be accessed at any time, may be 24 hours a day or 365 days of the year.
- ***Multiple Accesses:*** The same resources can be used at the same time by a number of users through local area network (LAN) or Wide area network (WAN).
- ***Fast Information Retrieval*:** The user is able to use and search term following to the word or phase of the entire collection.

Digital library will provide very user friendly interface; giving clickable access to its resources or we can say it is a very fastest information retrieval system.

- ***Preservation:*** We can save a master record of information and create multiple copies for user's point of view.
- ***Resource Sharing:*** A particular digital library can provide the link to any other resources of other digital library very easily and also linked our library from any other library thus we may provide resource sharing facility to our users.
- ***Quality of services:*** A digital library enhances the quality of services offered by a library and information center of any type in the best way.
- ***Latest Information:*** Whenever we received the information we can upload of the same for our users thus the users can access to latest and updated information earliest in compression of print material.
- ***Efficient Management of Resources:*** We can manage our resources in a very efficient way using digital library software. We can create different types of community related to our users and information may be providing in a systemic way.[8]

FUTURE

Once the project is implemented and become continuous, the organization may consider fir the future activities like:

- Setting up a "Digitization Centre".
- Building digitization into the normal workflow processes (assimilation).
- Maintaining a digitization budget for maintenance work
- Seeking national and international funding for new projects.
- Looking for collaborations.
- Keep digitization Policy up-to-date.

CHALLENGES IN DIGITAL PRESERVATION

Frequently occurs challenges in digital preservation are given below:

1 ***Storage media:*** The limited lives of magnetic and optical media pose a significant problem, although this is not the primary limiting factor for digital preservation. Recent researches on the longevity of magnetic media indicate a useful life span of 10 to 30 years if they are handled and

stored properly. Some optical disk technologies promise life spans of up to 100 years.

2 ***Migration:*** Migration is another biggest challenge in digital preservation Migration is a period based process that holds the core concept of a digital data during conversion from one hardware or software to another newer form and preserving its ambiguity and integrity. We can say it is an enhanced form of refreshing but differs in sense that exact copy of any database or any digital object is not possible due to hardware of software change.

3 ***Legal Issues: Copyright Law:*** When we are planning to digitize our resources, copyright law is a major factor which is affected our project In copyright law, copying is known as "reproduction," and it's one of the exclusive rights of the copyright owner. The right to publicly display a work is also an exclusive right of the copyright owner, as is the right to make an adaptation, known as a "derivative work." Our desire to keep digital information around for the future runs smack into the exclusive rights of the copyright owner.

4 ***Digital Obsolescence*:** The biggest challenge in the digital preservation is the issue of Digital Obsolescence. The technology changes continually. New components need new and updated software and operating systems. New software and operating system necessitates new formats, thus the digital world keeps on changing continually.

5 ***Authenticity of context:*** The biggest challenge in digital preservation is to retain the authenticity of the context within which it was created. The advancement of technology, the migration and conversion of technology, the preservation of any digital material within its context. The traditional preservationists argue that the environment within which a digital document was created should be preserved along with the same software, hardware, document type. But in a rapidly changing technological standpoint this is not possible.

6 ***Cost Implications:*** The cost implication has an important bearing on Digital Preservation as we do not have any tools, to estimate the future or long-term costs. The implication of costs depend upon storage, hardware and software costs and to some extent the costs on human resources. The ability to employ and develop appropriate skills is another area of concern with the rapid speed of technological changes. The important factor in the cost implications is the continuity of any preservation project as the break in the middle will result in negative effects.[9]

CONCLUSION

With the advent of new technology, major changes are taking place in the information world and technology are also rapidly changed therefore these major task should be keeping in mind while planning to digitization

our library. Libraries have been undertaking digitization of library resources to provide wide access to materials in their collections and to provide long-term preservation of these materials. It is good way to keep our culture heritage for a long term .Every library should go for it but with a strong planning is needed so that project should be succeeded. The digitization of the library has a given a new mission to Librarian in terms of providing training to their users in skills needed to discover access to in house as well as out house material as well as in evaluating the sources.

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Institutional Digital Repository at ITME Library using DSpace

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ABSTRACT

This paper discusses the concept of institutional digital repository and a brief overview of DSpace software including its architecture, workflow and search & retrieval system. It also discusses about the Institutional Digital Repository (IDR) at Institute of Technology & Marine Engineering (ITME) Library using DSpace software.

Keywords: Institutional Digital Repository, DSpace, ITME Library.

"A ship in port is safe, But that is not ships are for. Sail out to sea and do new things."
– Admiral Grace Hopper, Computer Pioneer

INTRODUCTION

A library plays a pivotal role in ensuring the success of higher degree as well as research in different field. College libraries are expected to provide cost effective and reliable access to information using the different modernized information technology tools. Engineering college libraries have also same expectation. The main goal of engineering education is to model a creative ethical engineer in different engineering and allied domains. One of the most important aspects of engineering education is exchanging the experiences, thus the better the communication between teachers and students, the better would be their

performance in acquiring all these. Institutional Digital Repository (IDR) may help immensely to establish the effective communication and to achieve creativity at the end.[1]

Institutional Digital Repository (IDR or IR), may be called as '*Scholars' Sanctuary*', is a digital archive where an institution community's intellectual works are made accessible and preserved for future. At the age information outburst, libraries are playing very vital role in shaping institutional digital repositories throughout the Global Village. Wikipedia defines an Institutional Repository is an online locus for collecting, preserving, and disseminating – in digital form – the intellectual output of an institution. The intellectual output include materials such as journal articles (both preprints & post prints), theses & dissertations, administrative documents, course notes or lecture notes, learning objects, etc. IR is partly linked to the notion of digital interoperability as well as partly to the notion of a digital library. The main objectives for having an institutional digital repository are:

- to create global visibility for an institution's scholarly research;
- to collect content in a single location;
- to provide open access to institutional research output by self-archiving it;
- to store and preserve other institutional digital assets, including unpublished or otherwise easily lost literature.[2]

According to Clifford Lynch, IR is most essentially an organizational commitment to the stewardship of the digital materials, including long-term preservation where appropriate, as well as organization and access or distribution.[3] In other words, such repositories:

- Provide a critical component in reforming the system of scholarly communication by expanding access to research, reasserting control over scholarship by the academy, reducing the monopoly power of journals, and bringing heightened relevance to the institutions and libraries that support them; and
- Have the potential to serve as tangible indicators of an institution's quality and to demonstrate the scientific, societal, and economic relevance of its research activities, thus increasing the institution's visibility, status, and public value.[4]

ITME LIBRARY: AN OVERVIEW

Institute of Technology & Marine Engineering i.e., ITME was established in the year 2002 by Educational Development Trust, Kolkata. The Institute is affiliated to West Bengal University of Technology, Kolkata and is recognized & approved by All India Council for Technical Education (AICTE), New Delhi & D.G. Shipping, Govt. of India, Mumbai. The fully residential Institute offers professional

education in 6 branches of engineering, viz., Marine Engineering, Computer Science & Engineering, Information Technology, Biotechnology, Electronics & Communication Engineering (B.Tech.) and Nautical Science (BNS) at the undergraduate level and VLSI Design & Embedded Technology at the post graduate level (M.Tech.).

ITME's prime source of knowledge is undoubtedly the Institute's exhaustive library. Where, effort has been made to provide students as well as faculty/ staff members with all the information they need to satisfy the Institute's vision 'Towards Tomorrow'. The Library serves the academic needs of about 1,200 students and nearly 200 faculty & staff members of the Institute. The resources of the Library stand more than 23,000 volumes of books, 150 back-volumes of periodicals and 1,200 CD-ROMs. The Library is subscribing 30 print and 241 E-journals & magazines (IEL Online) in the field of Engineering Science & Technology. The Library is a member of INDEST-AICTE Consortium, Govt. of India. The fully automated library uses LibSys (LSEase Rel. 5.7.1) automation software for the house-keeping operations like acquisition, cataloguing, circulation, etc. The entire collection of books, CD-ROMs, etc. and the Library Membership Cards are bar-coded generating through LibSys. All the databases are available on the institute network through Online Public Access Catalogue (OPAC).[5]

DSPACE

In March 2000, Hewlett-Packard Company (HP) awarded $1.8 million to the MIT Libraries and collaborated over two years to create the DSpace digital repository platform.[6] HP Labs and MIT Libraries released the system worldwide on November 4, 2002, under the terms of the BSD open source license, one month after its introduction as a new service of the MIT Libraries. As an open source system, DSpace is now freely available to other institutions to run as-is, or to modify and extend as they require meeting their local needs. From the outset, HP and MIT designed the system to be run by institutions other than MIT, and to support federation among its adopters, in both the technical and the social sense.[7]

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. It preserves and enables easy and open access to all types of digital content including text, images, moving images, mpegs and data sets.[8]

DSpace software system is designed to support every faction that a research organization needs to run a digital repository service and it is

very simple. The system's information model is built around the idea of organizational 'Communities' naturai sub-units of an institution that have distinctive information management needs.

- **Communities** are defined to be the departments of the Institution. Each community can adapt the system to meet its particular needs and manage the submission process itself.
- Communities can be divided into **sub –communities**, which can be further sub-divided and collections are part of a community or sub-community.
- **Items** are the actual resources that are uploaded into the IDR. Each item may belong to one collection. Each item contains bit streams that are the computer files that make up the IDR resource.[9]

In DSpace system the hierarchy is Community – Sub community – Collection – Item.

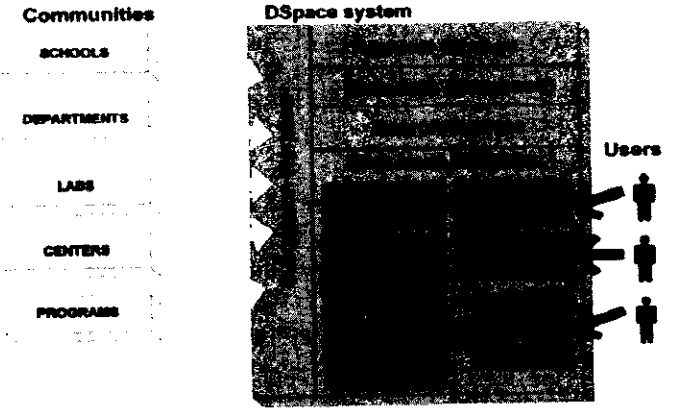


Fig. 1 : Information model of DSpace

Architecture

DSpace is designed to run on the UNIX platform, comprises other open source middleware, tools and programs written by the DSpace team. All original code is in the Java programming language. Other pieces of the technology stack include a relational database management system (postgreSQL), a Web Server and Java Servelet engine (Apache and Tomcat, both from the Apache Foundation), Jena (an RDF toolkit from HP Labs), OAICat from OCLC, and several other useful libraries. All leveraged components and libraries are also open source software. Libraries are bundled where possible (exceptions are described in the installation instructions). The system is available on SourceForge (*http://www.sourceforge.net*), linked from both the DSpace informational

web site and the HP Labs site. The DSpace system is organized into three layers (Fig. 2), each of which consists of a number of components.

- Storage layer: responsible for physical storage of metadata and content;
- Business logic layer: deals with managing the content of the archive, users of the archive (e-people), authorization and workflow;
- Application layer: containing components that communicate with the networked world outside of the individual DSpace installation, for example the Web user interface and the modules for metadata harvesting service.[9]

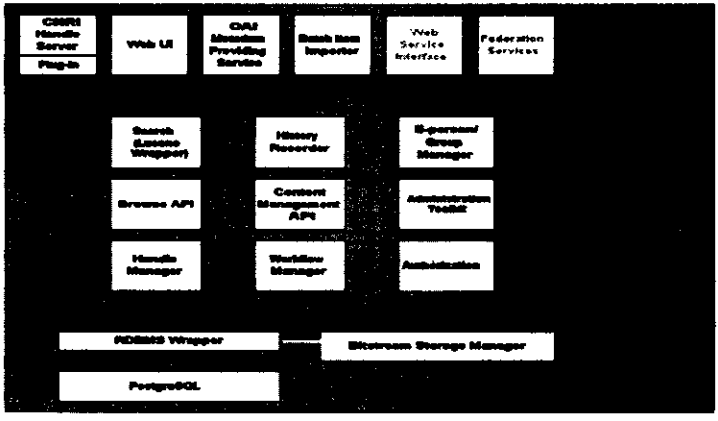


Fig. 2 : Architecture of DSpace

Workflow

The DSpace submission workflow system is a critical part of the DSpace architecture that allows submission, processing, and final addition of content to the live repository. DSpace's underlying model includes E-People, users who have registered with the system and have certain authorizations, roles, rights, and privileges that translate abilities to complete certain tasks within the DSpace system. A typical submission begins with the system asking the user a couple of questions about digital document to be added in the repository and number of files involved in the submission. Then the system guides the user through the different steps, which are outlined in the following table (Table 1):

Workflow Step	Description
1. Describe	User enters metadata about the document (s) they are submitting, including but not limited to author, title, keywords, and a description.

2. Upload	The user selects and uploads the files on their local machine that they like to upload as part of the submission. Each file's type is identified by the system and the user verifies the file type
3. Verify	An overview of all details of the submission is given including a summary of the entered metadata and the files involved in the submission.
4. License	The user is shown and must agree to the license the system administrator has assigned to submit content for this collection.
5. Complete	The user's actions in the submission process are complete. Based on the workflow steps set for the collection, the item may immediately be added to the collection or have to be reviewed by system administrators before its addition to the collection.

Table 1: DSpace submission Workflow Overview

Search and Retrieval

The end user can browse, search and access the collections using the hierarchies and also the alphabetic bar menu. For searching the collection, DSpace uses Lucene Search Engine, which is a part of Apache Jakarta Project. Lucene search engine, implemented in the business logic layer of DSpace, has very powerful search features that encompass many search approaches of the end user. It provides the basic exact term or keyword search. In addition, it allows fielded search akin to the field level search of library databases. DSpace supports all the search operators (like Boolean, Relational and Positional) and facilitates Boolean search, Field-level search, Range searches, Term boosting and Proximity searches.

USE OF DSPACE AT ITME LIBRARY

DSpace is a digital repository created to capture, distribute and preserve the intellectual output of ITME. DSpace provides stable long-term storage needed to house the digital products of ITME faculty/ staff members and students. DSpace enables easy remote access and the ability to read and search DSpace items throughout the campus. The ITME Library has a well structured, well designed webpage which is connected through campus LAN. We have already created a server for DSpace in which some archives of different journal/ magazine articles have already installed. This paper is a summary of our experiences of

setting up an Institutional Repository at ITME Library. The objectives of making IDR for ITME are:

- Pre-print of articles to organize and preserve faculty publications
- Conference papers.
- Teaching materials (lecture notes)
- Student's projects.
- Doctorial Theses and Dissertations.
- B.Tech/ M.Tech level question papers.
- B.Tech/ M.Tech level syllabus
- Administrative notice
- Freely available computer software
- Disseminating unpublished research results, etc.

Benefits of IDR at ITME

All the students and faculty/staff members will be benefited after the completion of IDR at ITME Library in the following way:

- E-documents of IDR can be found through the search engine.
- No charge to access the document(s).
- No subscription fees.
- Materials displayed in its original digital format, such as audio files, video files, images, data sets, etc.

LIBRARIAN'S ROLE

In the setup of IDR, everything is electronic. IDR development has resulted in new responsibilities for academic librarians in planning, management, and technical development. To meet these demands, some established positions have been modified; such as Research Programmers have been added and new types of positions have been created, viz., Repository Coordinator, Intellectual Property Specialist, Data Research Librarian, etc. In order to provide services to the users, librarians should be well versed with digital form, should have the knowledge to assist in searching indexes effectively & efficiently and in searching network databases of IDR.[10]

CONCLUSION

In fine, it can be concluded that the library and the library personnel will have to be more specialized, technically sound and better equipped to provide computerized information services to the users in a system like Institutional Digital Repository. This type of institutional repository would definitely help and solve the problems of researchers, faculty & staff members, and students of ITME. It is also true that the user should become computer literate and develop the skills of extracting computerized information services to the maximum level.

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Institutional Repositories: A Tool for Scholarly Communication

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ABSTRACT

The institutional repository (IR) is a contemporary concept that captures and makes available as much of institutional research output as possible to the users. It is a sort of a database of digital information resources, accessible through internet or intranet. Repositories are important for educational institutions in helping to manage and capture intellectual assets as a part of their information strategy and promote the widespread dissemination of scientific and scholarly production. In coming years self-archiving should be seen as an opportunity to contribute to the global knowledge base and increase attribution. In this paper the concept of institutional repositories, objectives for having an institutional repository, elements, choice of software for development of repositories, advantages and drawbacks of repositories has been mentioned. List of best practices for development of repositories has been also described.

KEYWORDS: Institutional repositories, open-access, self-archiving, open source software

INTRODUCTION

Information and Communication Technology (ICT) has a major impact on materials for research. Innovation in ICT has brought radical changes in the way information is generated, stored, processed, and disseminated. Recent advances in information and communication technologies, especially the Internet and the web has revolutionized scholarly communication, leading to innovations in the conduct of research as well as in the conveyance of ideas to readers. One of the important contributions of web technology has been the creation of the 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.

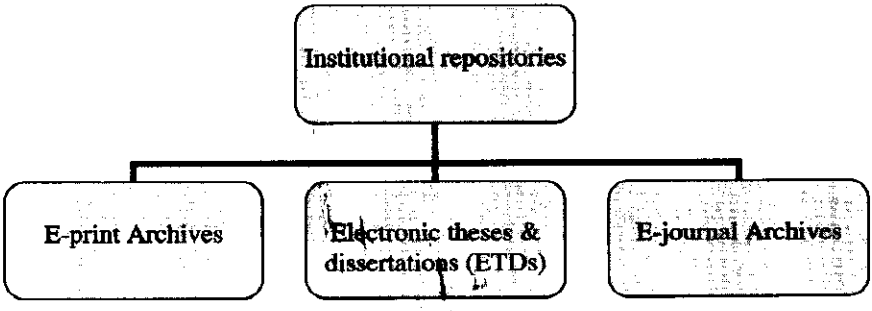
The goal of the open access movement is to make scholarly articles freely available in digital form world wide with minimal restriction in their use. The core essence of open access initiatives is to "make research articles in all academic fields freely available on the internet" notable among these initiatives are the working models of open access journals and institutional repositories.

CONTENTS OF AN INSTITUTIONAL REPOSITORY

An institutional repository may contain a variety of materials generated by students, faculty, researchers including institutional heritage and publications such publications are Pre-prints of articles or research reports submitted for publication, pre-print and post print journal articles, Conference papers, teaching materials, projects, theses and dissertations, software and programs, Photographs and works of art, video recordings, technical reports etc..

TYPES OF INSTITUTIONAL REPOSITORIES

Institutional repositories can be broadly categorized into three major categories, on the basis of the contents they offer:



4.1 E-print Archives: An ePrint archive is an electronic archive of ePrints. An ePrint is an electronic copy of a research paper; they can be preprints (e.g., not yet fully peer-reviewed).

4.2 Electronic Theses and Dissertations: Electronic theses and dissertations are popularly known as ETDs. ETDs are digitised version of conventional theses and dissertations. These are new genera of documents.

4.3 Open access e -journals: Open access journals are scholarly journals that are available online to the reader "without financial, legal, or technical barriers other than those inseparable from gaining access to the

internet itself." Some are subsidised, and some require payment on behalf of the author.

OBJECTIVES FOR HAVING AN INSTITUTIONAL REPOSITORY

The four main objectives for having an institutional repository are:

- To create global visibility for an institution's scholarship
- To collect content in a single location
- To provide open access to institutional research output by self-archiving it, and
- To store and preserve other institutional digital assets, including unpublished or otherwise easily lost ("grey") literature (e.g. theses or technical reports).

ESSENTIAL ELEMENTS OF AN INSTITUTIONAL REPOSITORY

*1 **Institutionally defined:*** Institutional repositories capture the original research and other intellectual property generated by institution's constituent population active in different fields. Institutional repositories represent an historical embodiment of the intellectual life and output of an institution.

*2 **Scholarly content:*** Depending on the goals established by each institution, an institutional repository could contain any work product generated by the institution's students, faculty, non-faculty, researchers and staff. This material might include classroom teaching materials, the institution's annual reports, video recordings, computer programs, photographs and art works. This content may include pre-prints and other works-in-progress, peer-reviewed articles, monographs, conference papers, electronic theses and dissertations, other ancillary research material and gray literature.

*.3 **Cumulative and perpetual:*** Essential to the institutional repository's role both within the university and within the larger structure of scholarly communication is that the content collected be both cumulative and maintained in perpetuity. Whatever the content submission criteria for a repository, items once submitted cannot be withdrawn—except in presumably rare cases involving allegations of libel, plagiarism, copyright infringement. Institutional repository systems must be able to accommodate thousands of submissions per year, and eventually must be able to preserve millions of digital objects and many terabytes of data. Providing long-term access to digital objects in the repository requires considerable planning and resource commitments.

4 Interoperability and Open Access: Providing no- or low-barrier access to the intellectual product generated by the institution increases awareness of research contributions. For the repository to provide access to the broader research community, users outside the university must be able to find and retrieve information from the repository. Therefore, institutional repository systems must be able to support interoperability in order to provide access via multiple search engines and other discovery tools.

BENEFITS/ADVANTAGES OF INSTITUTIONAL REPOSITORIES

Institutional repositories have many benefits such as:

*1 **One-stop-source***: Institutional repository helps in pooling the organisation's intellectual output, which is otherwise scattered, distributed and unnoticed, in one central place. The archive therefore serves as a one-stop-source or a single access point for the research output of an institution.

*2 **More exposure***: Repositories make the work available to everyone who may be interested. It provides opportunities to simplify and extend dissemination. A growing body of evidence shows that, as a result of being openly accessible, publications are cited more frequently.

*3 **Universal access***: While an article published in a journal may be available to only limited subscribers, the same article when also posted in a repository is available to all, greatly enhancing the public value of research.

*4 **Easier information discovery***: By opening their content to service providers such as Google, Google Scholar and OCLC, repositories allow web users to search every item they hold.

Persistent access: By depositing individual works in a repository, they will have persistent URLs (a reference URL) that will never change-no more dead links. Unlike items on ever-changing personal websites, works in repositories are available to whoever needs them, whenever needed.

*5 **Long-term preservation***: Digital repositories are committed to long-term access to and preservation of the collection.

*6 **Wide range of content***: Digital repositories collect more than just journal publications; they collect other types of materials, such as conference proceedings; images and sometimes research data-enabling users to integrate and provide access to a wide range of materials.

7 Increasing institution's prestige: Repositories demonstrate the quality, and scientific, social and economic relevance of an institution's research. These also increase the institution's visibility, status and public value.

8 Supporting teaching and learning: Since no library can afford to subscribe to all the resources students need, putting research works in a digital repository ensures students everywhere can read and learn from them. Students, who are early adopters of open approaches, are also benefiting from digital repositories by depositing their theses and dissertations-broadening the reach of these important works.

DIGITAL REPOSITORY SOFTWARES

1 OPEN SOURCE SOFTWARES

There are number of software's available freely for creating/developing institutional digitals repositories, some are as follows, further details can be viewed through their websites including feature and configuration etc.

DSpace: DSpace (http://www.dspace.org)

Eprints: Eprints (http://www.eprints.org)

Fedora (Flexible Extensible Digital Object and Repository Architecture)

Greenstone:

CDSware: (CERN Document Server Software (CDSware)

2. COMMERCIAL SOFTWARES

Apart form the above open source software, some commercially developed software also available for digital repository. Some of the important one are listed bellow The name of few is mentioned herein below;

CONTENTdm®- Developed at the University of Washington and distributed by OCLC. The software has tools for acquiring or creating collections; tools for storage of the content and a set of tools for display and retrieval of objects.

Digi Tool-This is an 'enterprise solution for the management of digital assets in Libraries and academic environment.

EN Compass- It is a one module of EN Compass or suite of software for managing and accessing digital content. EN Compass has many modules for various purposes.

Hyperion-It provides organisation, storage and access to digital files by searching both associated metadata and full text of text files.

Meta Source-Meta source is a suite of tolls used to manage digital collections, including, digital object storage, crawling external collections and support for Metadata schemes.

VITAL- VITAL is institutional repository software developed by VTLS. VITAL is a set of workflow extensions, management utilities and enhanced searching capabilities build on Fedora Repository Architecture.

BEST PRACTICES FOR GROWTH DEVELOPMENT IRS:

There is need to promote the growth and development of institutional repositories as a tool for scholarly communication. In order to promote the institutional repositories, best practices should be shared and could include the following methods:

1 Show value to authors: Many authors need to provide a list of publications for assessment purposes. Preparing publications lists and author web pages using open archives software can help convince authors on its wide applicability and the increased visibility it provides. Prolific authors can be specially targeted.

2 Access statistics: Provide access statistics, preferably at the document level. Uniform metrics should be adopted for all repositories.

3 Get support from the top: Where top levels of administrative support is there, self-archiving institutional repositories have flourished.

4 Training: Increase training opportunities among staff by holding workshops and providing education on functionality of institutional repositories. This is already being done to good effect but needs to be more widespread by targeting universities and research laboratories.

5 Registering repositories: Provision of better visibility by registering repositories with open access repositories such as ROAR, openDOAR, so that more people can know about the existence of such repositories.

6 Public opinion for mandating deposits: There should be policy for mandatory depositing of documents by faculty of the respective institution in the archive. It will help in collection development of the repository qualitatively as well as quantitatively.

7 Feedback: Comments coming from users of these repositories help in re-defining or make positive changes in archives, if necessary. These may be suggestions regarding metadata, or technical issues related to access. Necessary strategies and meticulously designed action plans could be charted out based on the feedback.

8 Promotion and advertisement: Various methods should be used to promote repositories. Respondents organise talks, seminars and training workshops can be organised to promote repositories. Methods such as

poster highlighting should be used. These include better impact, wider access and visibility.

DRAWBACKS OF INSTITUTIONAL REPOSITORIES:

Some of the major drawbacks of institutional repositories are:

- They affect the balance of institutional power as some departments proceed faster than others,
- Initial costs may be high as contributors perceive high risks and duplicate efforts to reduce them,
- They rely on unproven methods for long term digital preservation; and
- They may need quick wins to sustain institutional support

CONCLUSION

Development of institutional repositories is still in its infancy particularly in developing countries. A few of India's premier institutions, particularly science and technology area are providing open access to their research through repositories. Repositories are an intersection of interests for different communities: research, e-science, publishing, information management, learning and preservation.

In the coming years, institutional repositories will also help in defining new alternative ways to assess the quality of scholarly information in repositories, where not only journal publications but also the documents and draft reports on institutional thinking and research plans are preserved. Self-archiving should be seen as an opportunity to contribute to the global knowledge base and increase attribution.

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Institutional Repositories: Enhance to Scholarly Communication

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ABSTRACT

In the age of technological advancement, it is easy to find out, collect, organize, select and disseminate the information and also to store it in digital form. Every institute find out economic way of storing of information. It is possible with the help of developing institutional repositories (IR). Present paper highlights the concept of IR, need and importance of IR, typology, important key issues in IR, hardware and software requirement for IR and initiatives of IR at national and international level.

INTRODUCTION

In the current climate of rapid change whether political, economical, social or technological, the importance of knowledge cannot be ignored. Knowledge is seen to play a crucial role in the development of the society. The development of society is based on the development of the individual person of that society. Once society is developed automatically the nation will develop. In the present scenario knowledge had become an essence. It is a power. Developed countries have already realized the importance of knowledge and accordingly knowledge collected and organized properly. The developing countries like India are now realizing its importance. It has felt that without knowledge, society and then nation cannot develop.

Library is a place where knowledge can stored, accessed and disseminated properly. Therefore in the information explosion age, librarians are working as a knowledge manager. In the knowledge management following factors are important.

- To find out information
- To collect information
- To organize information
- To select information
- To disseminate information.

The importance of knowledge is increasing day by day. Therefore efforts have been made for to develop repositories of knowledge. Management is necessary for to collect and organize knowledge and to provide it as per demand of user for that purpose, it is necessary to create knowledge repositories.

Repositories provide services to faculty, researchers, and administrators who want to archive research. historic, and creative material. The open access and open archives movement, the need for changes in scholarly communication to remove barriers to access, and the increasing awareness that universities and research institutions are losing valuable digital and print materials have begun driving the establishment of institutional repositories, Using open archive models (http://www.openarchives.org) established metadata standards, and digital rights management, important new information sources are seeing the light of day and becoming more generally available.

For universities, repositories are marketing tools communicating capabilities and quality by showcasing faculty and student research, public service projects, and other activities and collections. Repositories in universities may include:

- Preprints and post prints of journal article.
- Technical report,
- White papers,
- Research data,
- Theses & dissertations,
- Work in progress,
- Important print and image collections,
- Teaching and learning material; and
- Materials documenting the history of the institution.

Digital university presses, such as:

- Highwire (http://highwire.Standford.edu),
- University of California escholarship editions (http://escholarship.cdlib.org/ucpressbooks.html)

- The University of Chicago Press, the Chicago Digital Distribution center, and Bibliovault (http://uchicago.edu) are publishing online and establishing digital archives.

The increased demand for scholarly information, especially in science, will probably increase the pressure on scholarly societies and universities. Digital publishing, global networking, more research, and increased communication among communities of scholars are driving the demand for broader access. The idea of the invisible college nurtured by meetings and preprints of journal articles has been replaced by global; Governments and government agencies may use repositories in the same ways as universities to document work in progress and the histories of agencies. Some agencies will find repositories useful for storage and access to technical reports, white papers, hearings, and other documents.

INSTITUTIONAL REPOSITORIES: (IR)

Institutional repositories are "digital collections that capture and preserve the Intellectual output of a single or multi-university community". While some repositories focus on particular subject domains, an institutional repository stores and makers accessible the educational, research and associated assets of an institution. Although most of currently established institutional repositories are 'e-prints' repositories, providing open access to the research outputs of a university or research institution, the content does not need to be limited to e-prints, but could potentially include research data, learning material, image collections and many other different types of content.(Yu Helen Hockx, 2006)

Institutional Repository is 'a digital archive of the intellectual product created by the faculty, research staff, and students of an institution and accessible to end-users both within and outside of the institution with few if any barriers to access (Johnson, 2002).

The IR are created and managed by academic institutions and publishers of the digital materials. According to Lynch (2003) "a university based institutional repository is a set of services that a university offers to the members of its community for the management and disseminations of digital materials created by the institution and its community members. It is most essentially an organizational commitment to the stewardship of these digital materials, including long term presentation where appropriate, al well as organization and access or distribution."

Aims / Objectives of Institutional Repositories:

1. To create global visibility for an institutions scholarly research.
2. To collect content in single location.

3. To provide open access to institutional research output by self-archiving it.
4. To store and Preserve other institutional digital assets, including unpublished or easily lost literature (i.e.) theses or technical reports.

NEED OF REPOSITORIES

The primary need of repository development within teaching and learning is to ensure:

- The availability of content;
- To improve the quality of the learning experience;
- To cater to different learning styles;
- To share and re-use digital objects.

CHARACTERISTICS

It has the following characteristics:

- Content is deposited in a repository, whether by the content creator, owner of third party on their behalf
- The repository architecture manages content as well as metadata
- The repository offers a minimum set of basic services e.g. put, get, search, access control
- The repository must be sustainable and trusted, well-supported and well-managed

TYPOLOGY OF REPOSITORIES

For easy online access to faculties, researchers and students, it is necessary to understand the typology of repositories.

By target user group

- Learners
- Teachers
- Researchers

By Content type:

- Raw research data
- Derived research data
- Full text pre-print scholarly papers
- Full text per-reviewed final drafts of journal/conference proceedings papers
- E-theses
- Full text original publications (institutional or departmental technical reports)
- Learning objects
- Corporate records (staff and student records, licenses etc)

By Coverage:

- Personal (author's personal achieve)
- Journal (output of a single journal or group of journals)
- Departmental
- Institutional
- Inter-institutional (regional)
- National
- International

By Primary functionality of repository:

- Enhanced access to resources (resource discovery and location)
- Subject access to resources (resource discovery and location)
- Preservation of digital resources
- New modes of dissemination (new modes of publication)
- Institutional asset management
- Sharing and re-use of resources

Here are some of the key issues to consider when developing repositories:

- The institutional culture
- The scope of the repository
- Content
- Access levels
- Legal aspects
- Standards
- Sustainability
- Funding

Librarian can prepare or develop following digital repositories:

1. Research Paper repository
2. Publication repository
3. PPT show repository
4. Sweet memory/Photograph repository
5. Our institution through Newspapers repository
6. Key Note Address repository
7. Vice-Chancellors / Principals speeches repository
8. Theses / Dissertations repository
9. Report repository
10. Minutes of Meetings repository
11. Question Papers repository etc.

The mechanism and activity flow chart of work of IR is given in the figure No.1 and figure No.2 respectively.

Mechanism

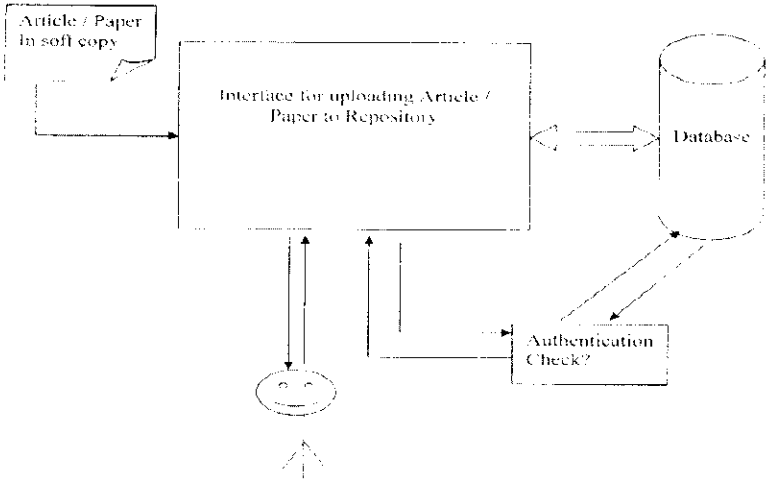


Figure No. 1

Activity Flow Chart

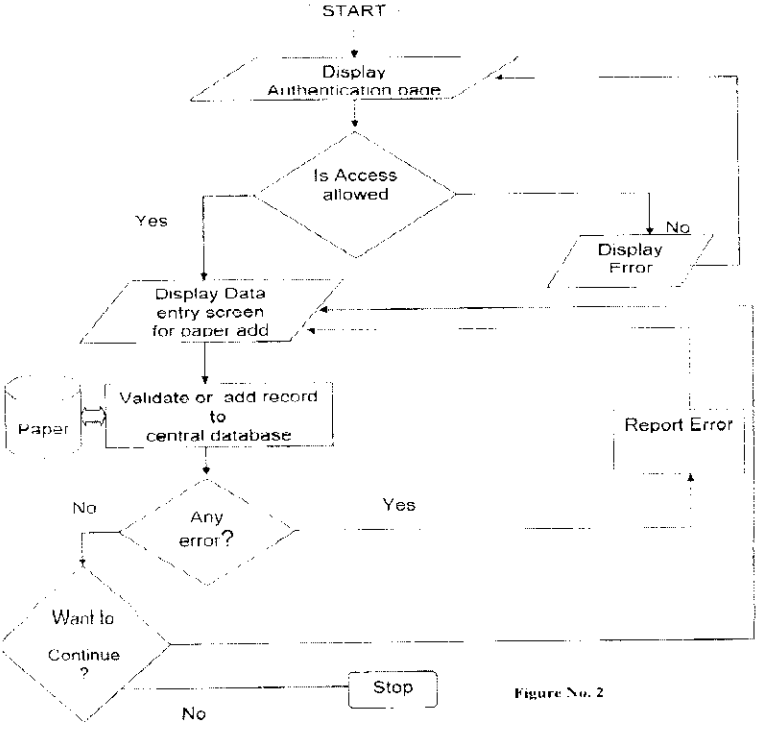


Figure No. 2

HARDWARE REQUIREMENT

Hardware is necessary for the purpose of storing and communication of the information. The following hardware is required:

- Intel Microprocessor based Dual Core Processor
- MB L2 Cache Memory with Intel E8500 chipset
- Storage Device Hard disk minimum 5 drives having 360 GB
- Scanner (Prefer Minolta PS 7000)
- High Capacity Camera
- At least 10 Desktop workstations with high speed Local Area Network and high speed internet connectivity

SOFTWARE REQUIREMENT

- For digitization: Open Source Software's: DSpace , Green stone (GSDL), EPrint, Fedora, C Dsware , ARNO, Diva etc.
- Other software's such as: Linux, Windows, Adobe Acrobat Reader, Image software, graphics software, Apache, Unix, Internet Explorer, Optical Character Recognition software, CD/DVD writer software etc.

INITIATIVES OF INSTITUTIONAL REPOSITORY

I. International Level:

- The Dspace repository project (http://dspace.org)
- The University of California's eScholarship Repository (http://repositories.cdlib.org)
- The developers of the Ohio State University (OSU) Knowledge Bank (http://www.llib.ohio-state.edu/kbinfo)
- In the U.K. the consortium of University Research Libraries (CURL) and the joint information System Committee(JISC) have established project SHERPA (http://www.sherpa.ac.uk)

II. National Level:

In India there are presently 37 institutional Repositories from different academic institution's such as research and development, management, universities etc.(Khan & Das, 2008) some educational and research institutes in India had already started their initiatives in building institutional repositories including a few universities such as central University Of Hyderabad and University of Delhi (Kamila, Kanchan. 2009). NISCAIR's Online Periodical Repository provides full-text access to more than 32 scholarly research journals of National Institute of Science Communication and Information Resources.

Indian Statistical Institute, some CSIR Laboratories, IIT'S etc also developed their Institutional Repositories regarding this subject India is the second position in Asia after Japan.

CONCLUSION

Repositories are valuable tools to enable sharing and reuse of resources. Intuitional Repositories(IR) are collections of digital material (pre-print, post-prints, theses, technical reports, grey literature and other digital material) hosted, owned or controlled by a college or a University. They are 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.

Technical skills have to developed for maintaining the repository and metadata Organizational and administrative matters like establishing Institutional Repositories, their funding and growing storage requirements for long-term preservation are some issues to be looked into.

No doubt IR is beneficial to faculty, research scholars, scientists and students which provide them an opportunity to access, communicate and publish their research findings online and also develop their career future.

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Knowledge Management through Institutional Repositories: A Study of LIS Repositories

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ABSTRACT

Digital repositories today are recognized as means of digitally archiving and enabling access to digital information. Repositories facilitate universities and colleges to manage and capture intellectual assets as a part of their information strategy. An institutional repository holds a wide range of materials for a variety of purposes and users. It supports research, learning, and administrative processes as well. However, repository solutions are most viable and sustainable when built on standards. The present study attempts to know the concept of Institutional Repository. Explains the aim and objectives of the study and analysis the data collected from Directory of Open Access Repositories (Opend OAR). Finally highlights the suggestions for creating and improvising the Institutional Repositories (IR) in India.

Keywords: Knowledge Management, Institutional Repository, LIS Repository

INTRODUCTION

In the information society, free flow of information is a fundamental principle for bridging the knowledge gaps between privileged and under-privileged communities. Social inclusion and economic empowerment are also achieved in a society where citizens have universal access to information and knowledge, ranging from public information to specialized or customized information related to ones' profession, vocation or culture. Open access to information and

knowledge is a key contribution in provisioning universal access to information and knowledge. It is gaining momentum in developed countries which already have necessary information infrastructure. In an information technology age, to be successful information services providers, library needs to strengthen services that allow creators, content managers and end users to manipulate the content in the way they like. In order to meet diversified needs of users' demands, librarians must be capable to send service, store, organize and archive content. In the same context educational institutions are required to design their repositories.

The Institutional Repositories (IR) help to store, manage, reuse and capture intellectual assets hold a wide range of digital materials and can support research, learning, and administrative processes as well. Repository solutions are most viable and sustainable when they are built on open standards. The term 'institutional repositories' can be applied to a number of different digital storage initiatives, which are often also be referred to as, 'digital repository', 'digital archives', or 'digital libraries' although in practice these each have slightly different functionality and underlying philosophies. Institutional repositories are a gainful and long-lasting commitment to the community, therefore should not be taken lightly. Today many softwares are available to create and maintain an institutional repositories and as a result there are less challenges in setting up.

DEFINITIONS OF IR

It is essential to get clarity about the concepts of IR and its application in various environments. With these objectives, during the literature survey, an effort has been made to document various definitions given by renowned authors and the scholars in their studies published in different sources. Some of the selected definitions are given below that have helped considerably to understand the IR concept.

According to Sahrsm, (2007) - "An institutional repositories is defined to be a web based database of scholarly material which is institutionally defined (as opposed to a subject based repository); cumulative and perpetual (a collection of record); open and interoperable (e.g. using OAI- compliant software); and thus collects, store and disseminates (is part of the process of scholarly communication). In addition, most would include long term preservation of digital material as a key function of IRs."

According to Barton and Margaret (2004), "Institutional Repositories is a database with a set of services to capture, store, index, preserve and redistribute a university's scholarly research in digital formats".

An institutional repository is a digital archive of the intellectual product created by the faculty, research staff, and students of an

institution and accessible to end users both within and outside of the institution, with few if any barriers to access. www.arl.org/sparc

In the simplest terms, an Institutional Repository is an electronic archive of the scientific and scholarly outputs of an institution, which have been stored in a searchable digital format and which are able to be retrieved for later use internally, nationally, and worldwide. A Repository supports mechanisms to import, identify, store, preserve, retrieve, and export an institution's digital assets, usually in the form of web pages. It is a type of content management system that holds the core intellectual assets of a university or college, and enables them to be used in a flexible way to support a variety of business processes. These intellectual assets include research and scholarly outputs, such as journal articles and theses, but may also include teaching and learning materials, presentations, research datasets, audio-visual records, and e-learning objects.

AIMS AND OBJECTIVES

The present study deals with one of the new thrust areas of library and information science, therefore the specific objectives need to be defined more precisely. In view of this fact, the study formulates the following objectives:

- To discern the quantitative and qualitative aspect of the content, item, language, and policies included in Directory of Open Access Repository (DOAR).
- To ensure the availability of publications for academic pursuits of the end users.
- To find out the possibilities of online accessibility of information sources among similar institutions.
- To know the Library and Information Science Institutional Repository (LISIR) available on DOAR.
- To analyze 51 LISIR available on DOAR based on selected study criteria.
- To know the open source software for IR.
- To locate the countries having IR.
- To provide suitable suggestions for upgrading and creating IR.

SCOPE AND LIMITATION OF THE STUDY

The IR initiatives are being taken up all over the world. India has recently shown keen interest in the area of knowledge management. The scope of the study has been confined to analysis of IRs available on Directory of Open Access Repositories (DOAR). Various universities and institutions of higher learning have initiated to set up IR for preserving, maintaining and sharing their scholarly

communication among their well defined users' community under Local Area Network (LAN) and Wide Area Network (WAN) environment. Total 1343 institutional repositories are listed on DOAR from all over the country on the different subjects. Out of these, 51 Library and Information Science Institutional Repositories (LISIR) are selected for the study. Analysis is presented on the basis of selected criteria like software used for repositories, content included, language used, country, etc. (http://www.opendoar.org) Access on 25/04/2009

ANALYSIS AND INTERPRETATION OF DATA

Profile of the Institutional Repositories

The institutional repository is the most important tool for accessing knowledge in digital age. The list of organizations having Institutional Repository is as follows:

Table 1: Profile of the Institutional Repositories

AKT EPrints Archive (Advanced Knowledge Technologies EPrints Archive	http://eprints.aktors.org/	U.K.
ALIA e-prints (Australian Library and Information Association e-prints)	http://e-prints.alia.org.au/	Australia
ARTS repository- University of Groningen	http://arts.eldoc.ub.rug.nl/	Netherlands
Caltech Library System Papers and Publications (CaltechLIB)	http://caltechlib.library.caltech.edu/	U.K.
CNR Bologna Research Library	http://biblio-eprints.bo.cnr.it/	Italy
Connect	hhttp://connect.educause.edu	U.K.
Cranfield CERES	http://dspace.lib.cranfield.ac.uk/dspace-oai/request	U.K.
Digital Library Federation Publications (DLF Publications)	http://www.diglib.org/publications.htm	U.S.
Digital Library of Information Science & Technology (dLIST)	http://dlist.sir.arizona.edu/perl/oai2	U.S
Dspace at Bromley College	http://vle.bromley.ac.uk/dspace-oai/request	U.K.
DSpace at Ibero American Science & Technology Education Consortium	http://dspace.istec.org/dspace-oai/request	U.S

(DSpace at ISTEC)		
DSpace at IBS Ahmedabad (DSpace@IBSA)	http://202.131.96.59:8080/dspace-oai/request	India
DViikki at University of Helsinki (DViikki)	http://www.tiedekirjasto.helsinki.fi/dspace-oai/request	Finland
Electronic Resource Preservation and Access Network ePRINTS Service (ERPAePRINTS Service)	http://eprints.erpanet.org/perl/oai2	U.K.
E-LIS	http://eprints.rclis.org/perl/oai2	Italy
eScholarship@UMMS	http://escholarship.umassmed.edu/cgi/oai2.cgi	U.S
Flinders University Library Flinders University	http://dspace.flinders.edu.au/dspace-oai/request	Australia
FREIMORE (FREIburger Multimedia Object Repository)	http://freimore.uni-freiburg.de/	Germany
GSLIS Electronic Archives Project	http://www.isrl.uiuc.edu/pep	U.S
HAL Hyper Article en Ligne	http://hal.archives-ouvertes.fr/oai/oai.php	France
Hyper Article en Ligne - Sciences de l'Homme et de la Société	http://halshs.ccsd.cnrs.fr/	France
INFORM Conference Proceedings	http://database.aipberoun.cz/aip_standalone/engine/aip_inforum.cg4?MainPage==../wt_inforum/inforum_en_combined.htm	Czech Republic
Informatics@Edinburg-Report Series	http://www.inf.ed.ac.uk/publications/report	U.K.
Information Literacy Research	http://www.ilit.org/ilresearch/indexilresearch.htm/	U.K.
INFORUM 2006 - Proceedings	http://www.inforum.cz/inforum2006/english/sbornik.php.htm	Czech Republic
International Centre for Diarrhoeal Disease Research Digital Repository, Bangladesh (ICDDR,B)	http://dspace.icddrb.org/dspace-oai/request	Bangladesh
l'ENS Lettres et Sciences Humaines de Lyon	http://eprints.ens-lsh.fr/perl/oai2	France
Librarians' Digital Library (LDL)	https://drtc.isibang.ac.in/oai/request	India

Mémoires en Sciences de l'Information et de la Communication (mémSIC)	http://memsic.ccsd.cnrs.fr/perl/oai2	France
My Manuscript	http://mymanuskrip.fsktm.um.edu.my/Greenstone/cgi-bin/library.exe	Malaysia
OCLC Research Publications	http://www.oclc.org/research/publications/	U.S
Open Video Project	http://www.open-video.org/oai2.0/	U.S
OPUS-Datenbak Würzburg-Schweinfurt	http://www.opus-bayern.de/fh-wue-sw/oai/oai2.php	Germany
OPUS-Datenbank Berufsverband Information Bibliothek (OPUS-Datenbank BIB)	http://www.opus-bayern.de/bib-info/oai/oai2.php	Germany
OR08 Publications (Open Repositories 2008 Publications)	http://pubs.or08.ecs.soton.ac.uk/cgi/oai2	U.K.
OZone (OZone provided by Ontario Scholars Portal)	http://ozone.scholarsportal.info/oai/request	Canada
PROJECT.iu.hio.no (Oslo University College's PROJECT.iu.hio.no)	http://eternity.iu.hio.no/theses	Norway
Public Knowledge Project EPrint Archive	http://research2.csci.educ.ubc.ca/eprints/perl/oai2	Canada
Publicaties Bibliotheek RUG	http://bibliotheek.eldoc.ub.rug.nl/oai	Netherlands
Publications of the Interactive and Cooperative Technologies Lab	http://ict.udlap.mx:9090/Tales/Oai_tesis	Mexico
Queensland University of Technology ePrints Archive (QUT ePrints Archive)	http://eprints.qut.edu.au/perl/oai2	Australia
REPOSCOM (Repositórios Institucionais em Ciências da Comunicação)	http://reposom.portcom.intercom.org.br:8081/dspace-oai/request	Brazil
Repositório Acadêmico de Biblioteconomiae Ciência da Informação	http://www.bsf.tehospedo.com.br/ojs/oai/	Brazil
Search4Dev	http://dare.uva.nl/cgi/arno/oai/dprn	Netherlands
SFU Repository (Simon Fraser University	http://ir.lib.sfu.ca/dspace-oai/request	Canada

Institutional Repository)		
SILS Electronic Theses & Dissertations (SILS-ETD)	http://etd.ils.unc.edu/dspace-oai/request	U.S
Tampere University Dissertations	http://acta.uta.fi/english	Finland
Ted Nelson's EPrint Archive	http://tprints.ecs.soton.ac.uk/perl/oai2	U.K.
University of Tennessee Sunsite Open Archives Initiative	http://oai.sunsite.utk.edu/cgi-bin/oai2.cgi	U.S
University of Wales Aberystwyth Repository (CADAIR)	http://cadair.aber.ac.uk/dspace-oai/request	U.K.
UPSpace (UPSpace at the University of Pretoria)	http://www.up.ac.za/dspace/request	South Africa

Software used for LIS Institutional Repositories

Intellectual outputs of research can be accessed through two modes of open publication i.e. open access journal and institutional repository. Below are discussed some of the well known IR softwares.

Table: 2 Software used for LIS Institutional Repositories

Name of the Software	No. of organization	Percentage
Dspace	14	27.45%
Wildfire	2	3.92%
Greenstone	1	1.96%
E-Prints	13	25.49%
Digital Commons	1	1.96%
HTML	3	5.88%
MyCo	1	1.96%
HAL	2	3.92%
OAIcat	1	1.96%
Sunsite	1	1.96%
OPUS	2	3.92%
DRUPAL	1	1.96%
Not Specified	9	17.64%
Total	**51**	**100%**

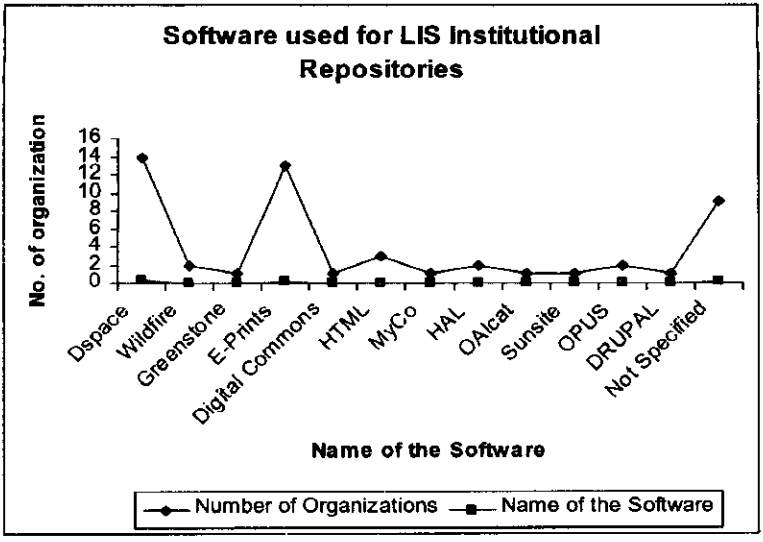


Table 2 and figure shows that the majority of 14 (27.45%) organizations are using DSpace software and 13 (25.49%) organizations are using E-Prints software. Wildfire, HAL, and OPUS software is used by 2 (3.92%) and HTML software by 3 (5.88%) organizations respectively. Thus it is observed that DSpace and E-Prints software are the most common softwares used for IR.

Items Included in LIS Institutional Repository

IR facilitates storing and maintaining of digital information in accessible form. Items can only be deposited by accredited members of the institutions. Anyone can access full items free of charge. IR plays an important role to see that the items collected are both cumulative and maintained in perpetuity. Items included in organization have been shown in table 3

Table: 3 Items included in LIS Institutional Repositories

Range of Items	No. of IR	Percentage
1-1000	34	66.66%
1001-2000	3	5.88%
2001-3000	2	3.92%
3001-4000	2	3.92%
4001-5000	-	-
5001-6000	1	1.96%
6001-7000	-	-
7001-8000	-	-
8001-9000	3	5.88%
9001-10000	2	3.92%
Not specified	4	7.84%
Total	**51**	**100%**

It is observed from Table 3 that 2 (3.92%) out of 51 organizations each have range of items between 2000-3000, 3000-4000 and 9000-10000 respectively. 3 (5.88%) organizations each have 8000-9000 items. Maximum organizations i.e. 34 (66.66%) have minimum number of items ranging from 1-1000. Out of 51 organizations, 4 (7.84%) organizations have not provided the number of items included in Institutional Repository.

Country wise LIS Institutional Repositories

Many institutions are involved in forming IR in their own way. The libraries in India and abroad are digitizing their scholarly outputs in the form of institutional repository and are making them available to the readers' world wide for consultation. The following table reveals the availability of LIS Institutional Repository in various countries.

Table 4: Country wise LIS Institutional Repositories

Countries	No. of Organization	Rank
United States	11	1
United Kingdom	9	2
France	4	3
Netherlands	3	4
Australia	3	4
Germany	3	4
Canada	3	4
Italy	2	5
India	2	5
Finland	2	5
Czech Republic	2	5
Brazil	2	5
Malaysia	1	6
Bangladesh	1	6
Norway	1	6
Mexico	1	6
South Africa	1	6
Total	**51**	

The above table depicts that United State ranks first amongst all the countries as it has posted 11 organizations. United Kingdom has 9 organizations and France is next with 4 organizations. Netherlands, Australia, Germany and Canada have 3 organizations each. Italy, India, Finland, Czech Republic, and Brazil have posted 2 LISIR. Malaysia, Bangladesh, Norway, Mexico, and South Africa hold the bottom ranks as they have posted only 1 organization each.

Types of LIS Institutional Repository

Institutional repositories build on a growing grassroots faculty

practice of posting research online, most often on personal web sites, but also on departmental sites or in disciplinary repositories. This demonstrates a desire for expanded exposure, and access to, their work. In addition, digital publishing technologies, ever-expanding global networking, and enabling interoperability protocols and metadata standards are coalescing to provide practical technical solutions that can be implemented now.

Table 5: Types of LIS Institutional Repositories

Types of IR	No. of LISIR	Percentage
Institutional-Operational	31	60.78%
Disciplinary-Operational	12	23.52%
Institutional-Trial	1	1.96%
Aggregating-Operational	1	1.96%
Aggregating-Closed	1	1.96%
Disciplinary-Closed	1	1.96%
Not Specified	4	7.84%
Total	**51**	**100%**

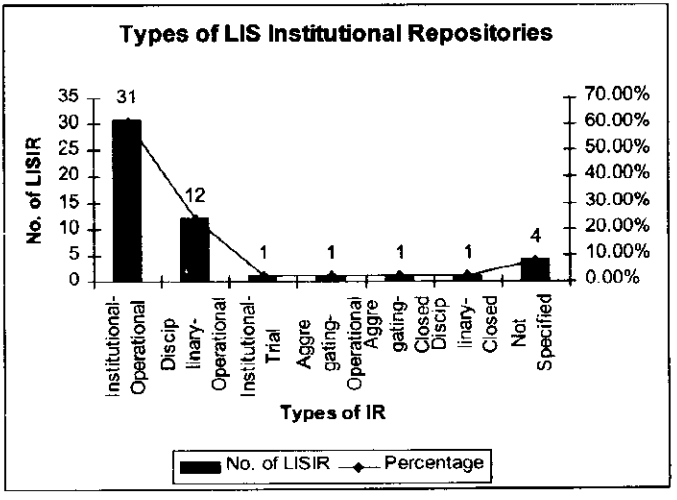


Table 5 shows the analysis of types of Institutional Repositories. It is observed that 31 (60.78%) LISIRs are Institutional-Operational and 12 (23.52%) are Disciplinary- Operational. Only 1 (1.96%) organization is Institutional-Trial, Aggregating-closed and Disciplinary closed each respectively. 4 (7.84%) organizations have not specified the type of Institutional Repository.

Languages included in LIS Institutional Repository

IR is a practical, cost effective, and strategic mean for an institution to build partnership with its faculty for advanced scholarly

communication. Scholarly communication is a system through which research and other scholarly writings are created and evaluated for quality. Languages play a vital role in communication of information. Languages practiced in LIS Institutional Repository are shown in the below table.

Table 6: Language wise distribution of LIS Institutional Repositories

Languages	No. of LISIR	Percentage
English	28	54.90%
English-Dutch	3	5.88%
English-Welsh	1	1.96%
English-Spanish	3	5.88%
English-Finnish	3	5.88%
English-Italian	1	1.96%
English-French	2	3.92%
French	2	3.92%
English-German	1	1.96%
German	3	5.88%
English-Hindi	1	1.96%
English-Canada	1	1.96%
Portuguese	2	3.92%
Total	**51**	**100%**

Table 6 depicts that, the majority of 28 (54.90%) LISIRs are in English language, 3 (5.88%) German, and only 2 (3.92%) are in French and Portuguese languages. It is also clear from the above table that 3 (5.88%) out of 51 LISIRs are in combination of English-Dutch and Spanish-Finnish language respectively. Thus it can be concluded that English language is the most common language for IR.

FINDINGS

The study has lead to the following observations:

- D-Space and E-Prints are the commonest softwares used for Institutional Repositories. i.e. 14 (27.45%) and 13 (25.49%).
- Maximum no. of items is posted by REPOSCOM (9154) and University of Tennessee (1089) followed by Queensland University of Technology e-Prints Archive (QUT e-prints Archive) (8881) and E-LIS (8847).
- 34(66.66%) LISIRs come under the range of 1-1000 items posted on Institutional Repositories.
- United State has posted maximum i.e. 11 LISIRs followed by United Kingdom with 9 LISIR and India has posted only 2 LISIRs.

- 31(60.78%) LISIR are Institutional-Operational, 12 (23.52%) Disciplinary-Operational whereas 2 (1.96%) LISIR are Institutional-Trial, Aggregating-Operational, aggregating –closed and Disciplinary-closed each.

SUGGESTIONS

Setting up of an IR needs a planned approach for the implementation tasks defined by their governance structure, management framework, operational strategies and a well documented workflow. Adoption of the standards and choice of models are critical factors for developing an IR. Below are discussed some valuable suggestions for setting IR.

- The government and the government agencies including universities and important research establishment like CSIR, ISRO, DRDO, ICAR, ICMR, must take a policy decision for setting up of IRs in their respective organization.
- An intensive awareness should be brought for the librarians and the users highlighting the benefits of IR.
- IR should be a mandatory part of the syllabus of Library and Information Science curriculum in India.
- Time demands to conduct workshops and training programmes for creating expertise in setting up of IRs.
- The capability of customizing the open source softwares to suit local requirements, at national level should be developed.
- It is appreciable to arrive at consensus on standard to be adopted for implementation of IRs in the country.
- Some incentives for contributions of research output to IR can be announced. These contributions can also be made mandatory at individual institutional level.
- It is advisable to have IRs at the Institutional level, one can also think of setting up of metadata harvesting service covering different sectors both by organization and by subject.
- There is a need to set up a registry of Indian repositories in line with Registry of Open Access Repositories (ROAR) and Directory of Open Access Repositories (OpendOAR).
- All leading universities and Research and Development establishment and also consortia coordinators should write to all commercial and societal publishers to allow individual scientists to deposit their research publication from the concerned individual institutional IRs. This would facilitate development of IRs without infringement of IPR of publishers.
- All institutions should provide necessary infrastructure including servers, PCs, scanners, Internet bandwidth and software required for setting up of IR. Required funds and manpower should also be made available.

CONCLUSION

Institutional Repositories are now clearly and broadly being recognized as essential infrastructure in the digital world. At present there is no single comprehensive and authoritative list which records academic open access repositories. In a networked environment, Information Discovery and Retrieval are the keys to the successful delivery of services. By listing archive and their description, open DOAR will support third party service provider.

As even the weal theist institute cannot purchase access to all the information that all their researchers require. New technology, in particular the coming of the Internet allows to revise or to reinvent scholarly communication. There is a need for development of Institutional Repositories and open access initiative so that the way they interact could result in a future where the world's research is available to all.

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Open Access Resources and Institutional Repositories: A Case Study of India with Special Reference to Chhattisgarh

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ABSTRACT

The purpose of this paper is to equip with the latest trends of institutional repositories including open access publishing particularly in India. Data was collected from directories of open access journals and institutional repositories. The URL of each institutional repository and open access journals publisher was visited to collect relevant data and information. Data were also taken from earlier studies. Case study method was used to know the trends of open access publishing in India. Data is analyzed based on certain parameters, such as number of institutional repositories and open access journals, number of documents, software used, types of documents, etc. India's contribution in open access publishing is quit well. It was found that status of institutional repositories in Chhattisgarh region of India is not satisfactory.

OPEN

Access to information, the foundation of scholarly communication, has traditionally been provided through academic journals, research collections, and other print publications. Recent advances

in information and communication technologies, especially the Internet and the web based scholarly communication, leading to innovations in the conduct of research as well as in the conveyance of ideas to readers [1]. 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.

The open-access is the worldwide effort to provide free online access to scientific and scholarly research literature, especially peer-reviewed journal articles and their preprints. Essentially it means the provision of free, immediate (upon publication), permanent access to research results for anyone to use, download, copy and distribute. Moreover, the definition stipulates that articles are placed in an organized repository (rather than simply on author websites) which is interoperable according to a specific set of standards such as the Open Archive Initiative-Protocol for Metadata Harvesting (OAI-PMH). Open Access is "cost effective way to disseminate and use information. It is an alternative to the traditional subscription–based publishing model possible by new digital technologies and networked communication" [5]. The goal of the open access movement is to take scholarly articles freely available in digital form world wide with minimal restrictions in their use.

Open access literature is available in open access journals, institutional repositories, subject repositories, digital archives, and so on. Another service has gained momentum after establishment of different institutional repositories or open access archives is the metadata harvester. Metadata harvester harvests metadata from various open access archives and open access journals [2].

INSTITUTIONAL REPOSITORIES (IRs)

The institutional repository is an open web-based archive of scholarly material, emerged during the second half of 2002 with the launch of Dspace at MIT. It is a database with a set of services to capture, store, index preserve and redistribute a university's scholarly research in digital formats.

IRs is partly linked to the Open Archives Initiative (OAI) and its open Archives Initiative Protocol for Metadata Harvesting (OAI+PMH). The OAI in turn had its roots in the notion of a "Universal Preprint Service".

An Institutional Repository is an on-line locus for collecting and preserving –in digital form- the intellectual output of an institution,

particularly a research institution. For a university this would include materials such as research journal articles before (preprint) and after (post prints) undergoing peer review, and digital versions of theses and dissertations, but it might also include other digital assets generated by normal academic life, such as administrative documents, course notes or learning objects.

There are two objectives for having an institutional repository:

- To provide open access to institutional research output by shelf archiving ;
- To store and preserve other institutional digital assets including unpublished or otherwise lost ("grey") literature (e.g. theses or technical reports) [9].

MAJOR STEPS IN BUILDING AN INSTITUTIONAL REPOSITORY

Broadly speaking, the following steps are the major milestones will be encounter in building an institutional repository:

- Learning about the process by reading about and examining other institutional repositories.
- Developing a Service Definition and Service Plan:
    - Conduct a needs assessment of your university.
    - Develop a cost model based on this plan.
    - Creative a schedule and timeline.
    - Develop policies that govern content acquisition, distribution,
    - And maintenance.
- Assembling a team
- Technology – choose and install software platform
- Marketing
- Launching a service
- Running a service

INSTITUTIONAL REPOSITORY: WORLD TRENDS

e-Scholarship, the California Digital Library Repository (http://scholarship.cdlib.org/), was announced in April 2002. Dspace is MIT's IR (https://dspace.mit.edu/index.jsp), lunched in November 2002. In the UK, the JISC is funding a series of projects under the FAIR programme (Focus on Access to Institutional Resources (www.jisc.ac.uk/index.cfm!name=programme-fair) [8].

The Directory of Open Access Repositories - OpenDOAR listed 1432 open access repositories in the world having more than 12840 records [3]. There in now adequate easily available software to create and

maintain an IRs. Dspace, GNU E-prints, HAL, OPUS, Bepress, ETD-db are some important software's used by these IRs. The contents of most of the IRs include demonstration, research cross- institutional, research institutional or departmental, and e-journal/Publication-thesis and databases.

INSTITUTIONAL REPOSITORY IN INDIA

The Indian Institute of Science was the first in the country to setup and interoperable institutional repository (ePrints@IISc), under the leadership of the late Dr. T.B. Rajshekhar. The archive now has more than 9,000 documents, with over 90 percent having full text [7]. The Registry of Open Access Repositories (ROAR) has mentioned 21 IRs in India. Unfortunately, out of these only 20 were accessible and functional at the time of writing this article [6]. The detail of IRs of India is shown in Table 1.

Table – 1: List of IRs with number of documents

Name of IRs, Host Institutions, Place and URL	No. of Items	Documents included	Software Used
Bioinformation, BMI Inc. URL: http://www.bioinformation.net	___	Research papers, Articles, Reports, etc.	Other Software Various (OAI)
DSpace at INFLIBNET, INFLIBNET Centre, Ahemdabad URL: http://dspace.inflibnet.ac.in	504	Research papers, Articles, Reports, etc.	DSpace
DSpace at University of Hyderabad URL: Not applicable	___	Research papers, Articles, Reports, etc.	DSpace
IIA Repository, Indian Institute of AstroPhysics, Bangalore URL: http://prints.iiap.res.in	725	Research paper, Articles, Reports etc.	DSpace
DU Eprints Archives, University of Delhi, New Delhi URL: http://eprints.du.ac.in/perl/oai2	186	Pre-prints, conference, patents, etc.	GNU EPrint
EPrints@IIMK, Indian Institute of Management (IIMK), Kozhikode URL: http://eprints.iimk.ac.in/	25	Research papers, Articles, Reports etc.	GNU EPrint
EPrints@IIT D, Indian Institute of Technology, New Delhi URL: http://eprint.iitd.ac.in/dspace/	2196	Research papers, Articles, Reports etc.	DSpace

ETD@IISc, Indian Institute of Science (IISc), Bangalore URL: http://etd.ncsi.iisc.ernet.in/	153	Theses & Dissertations	DSpace
EPrints@IIITA, India Institute of Information Technology, Allahabad URL: http://eprints.iiita.ac.in/	22	Research paper, Articles, Reports, etc.	GNU EPrints
DSpace@IIMK, Indian Institute of Management, Kozhikode URL: http://dspace.iimk.ac.in/	433	Research paper, Articles, Reports, etc.	DSpace
EPrints@IISc, Indian Institute of Science (IISc), Bangalore URL: http://eprints.iisc.ernet.in/perl/oai2	9117	Conference, Unpublished, Patents, etc.	GNU EPrints
ISI Library, Indian Statistical Institute (ISI), Bangalore URL: http://library.isibang.ac.in:8080/dspace/	10	Research paper, Articles, Reports, etc.	DSpace
Librarian's Digital Library (LDL), DRTC, Bangalore URL: http://drtc.isibang.ac.in/	398	Research paper, Articles, Reports, etc.	DSpace
NAL Institutional Repository, National Aerospace Laboratories, Bangalore URL: http://nal-ir.nal.res.in/	418	Research paper, Articles, Reports, etc	GNU EPrints
EPrints at NCL, National Chemical Laboratory (NCL), Pune URL: http://dspace.ncl.res.in/	290	Theses, Research paper, Articles, Reports, etc.	DSpace
Digital Repository Service of NIO, National Institute of Oceanography, Mumbai URL: http://drs.nio.org/drs/	55	Conference Proceeding Articles, Technical reports, Theses, Dissertations, etc.	DSpace
Dspace@NITR, National Institute of Technology, Rourkela URL: http://dspace.nitrkl.ac.in/dspace/	223	Theses, Research paper, Articles, Reports, etc	DSpace
OneWorld South Asia Open Archive Initiative, OneWorld South Asia Open Archive Initiative (OWSA) URL: http://open.ekduniya.net/perl/oai2	75	Conference, Theses, Unpublished, Patents, etc.	GNU EPrints

OpenMED@NIC, National Informatics Centre (NIC) URL: http://openmed.nic.in/	1035	Research paper, Articles, Reports, etc.	GNU EPrints
Rajiv Gandhi Centre for Biotechnology, RGCB, Thiruvananthapuram URL: http://www.rgcb.res.in/	___	Research paper, Articles, Reports, etc.	Other softwares (various)(OAI)
Digital Repository of RRI, Raman Research Institute, Bangalore URL: http://dspace.rri.res.in/	1064	Research paper, Articles, Reports, etc.	DSpace

Above table shows list of founded IRs and subject repositories in India. Most of the IRs are related to Science and Technology than Social Science and Humanities. They have different objectives to store and provide access to collection of materials. Some IRs store and disseminate output of specific subjects i.e. DRTC, Bangalore in the field of Library and Information Science another subject specific repository is open Med @NIC, New Delhi maintain biomedical literature. Other kind of digital repositories existing in India stores and provides access to documents type specific collection. Vidyanidhi, University of Mysore is an example document type specific collection that stores and provides access to theses and dissertations.

STATUS OF IRs IN CHHATTISGARH

The state Chhattisgarh was formed on 1st November 2000. There are seven universities in Chhattisgarh, two of them are belongs to private sector and a newly upgraded central university namely "Guru Ghasidas Vishwavidyalaya", located at Bilaspur. They are offering UG, PG, M.Phil. and Ph.D programmes in various disciplines including Chhattisgahari literature emphasis on folk arts, tribal culture, natural resources, etc. During the case study of institutional repositories, it was found that there is none of them belongs to Chhattisgarh region of India is zero. There is need to take initiative regarding to setup an IRs in Chhattisgarh region to make available Chhattisgarhi literature and so many literatures in this region online.

FUTURE OF IRs IN INDIA

There has been a good move in India with regard to IR setting up and a lot of efforts dedicated to aware the benefits of IRs to store and disseminate scientific knowledge of the society. A special session on open access was held at the 93rd Indian Congress in January 2006 with the recommendation for the "Optimal National Open Access Policy"[7]. The majority of the existing repositories in India have been established by the participants of this workshop.

In India, there are a large number of research institutions under ICMR, ICAR, CSIR, and ICSSR which are engaged in research activities. They are interested to disseminate their scientific output in the form of research publications through the open access institutional repositories. An open access statement is likely to be ready by this year (2006-2007).The CSIR also has a plan to setup a national digital repository of research literature.

National knowledge commission is also formulating similar open access policies and guidelines for the higher education and R & D sectors to improve access to research literature and disseminate research literature to the global communities [4].

In near future, we would see a sustainable growth of open access journal and open access repositories from India.

CONCLUSION

Importance of open access archives (OA) and institutional repositories (IR) has been realized by the library and information professionals in India. IR brings the scholarly contents into open access that can be accessed freely. Whether pre-print or post print (peer reviewed): all make available free of cost. It is being proved most crucial catalyst in propagating the noble cause of open access and strengthening the open access movement. This movement has been accelerated by the availability of open source software namely DSpace, EPrints, Greenstone, etc.

The research institutions in India are actively involved in the development of Institutional repositories. Indian Institute of Science, Bangalore and INFLIBNET Centre, Ahmedabad are the leading institutions who make the setting of IRs a success. It can conclude that open access resources and institutional repositories are two important means for delivering open access to research articles. The difference between these two is that open access resources conduct peer review but institutional repository does not have such provision.

But the common problem faced by most of the institutes is the lack of infrastructure and lack of awareness, However, that institution are setting up IRs. The publications from developing countries do not much viewed by international communities. They have been made a general mentality that publication is not much valuable and importance. In India, situation is now changing in order to proceed to open access .through institutional repository.

Indian institutions/ organizations/ universities are making move to setup open access repositories within their financial estimate and availability of infrastructure. Some studies and usage statistics of some repositories show that the researchers of developed nations are accessing the Indian literatures 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 literature originated from developing countries.

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Overview of the Evolution of Institutional Repositories to Access the Scholarly Contents

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ABSTRACT

The tremendous growth in scholarly digital contents have pays the way for managing them effectively so as to scholars can share the contents as early as possible for better research output. This paper have taken a look on the evolution of Institutional Repositories from the very early FTP based preprint server to full grown www based IRs.

The Institutional Repositories came into existence as a response from the scholars to post their research online usually on their homepages, but also in subject repositories, in the year 2002. (Johnson, 2002).[1] Repositories are related with a number of different types of initiatives. A bulk of literature is existed that describe and explores about their role in scholarly communication and publishing. The scholarly Electronic Publishing Bibliography (Bailey 2006) [2] contains over 200 entries on the section Repositories, E-prints and OAI, whilst the Open Access Bibliography (Bailey 2005-2007)[3] contains over 200 entries in the Institutional archives and repositories subsection.

DEVELOPMENT OF INSTITUTIONAL REPOSITORIES

The development of Institutional repositories is started with development in the preprint servers and enabling technologies such as OAI-PMH (Open Archives Initiative-Protocol for Metadata) and Open source repositories software. The Institutional Repositories can also be looked upon the development in the Open Access movement.

ONLINE ARCHIVES – The Digital Preprints and Post prints

The origins of the institutional repositories can be traced back to the early 1990s when the new networked academic environment allowed researchers to communicate faster using the new digital communication channels. In certain subject areas such as Physics and Mathematics

scientist were accustomed distributing preprint – versions of articles that have been submitted to journals but still not published- among interested colleagues. An informal way of communication (McKiernan, 2002) it helped the researchers to keep up to date with the most recent research as the time lag between journal articles submission and publication could be quite slow. Harnard suggested that one of the biggest impacts of revolution of electronic networks could be on prepublication. Using network topologies, such as FTP and EMAIL preprints could be distributed to fellow academics around the world almost instantaneously and at a low cost.

rXiv

Originally known as The LANL (Los Alamos National Laboratory) preprint archive, and later renamed as arXiv. This was the first online archive for the physics and later expanded to other subject areas (Astronomy, Mathematics, Computer Science, Nonlinear Sciences, Quantitative biology and Statistics). Created by Paul Ginsparg in 1991, the archive originally used email to alert the subscribers to new submissions who could then access the full text on demand using FTP server technology (McKiernan 2000, Ginsparg 1996)[4,5]

It has been and continues to be used an example of successful archive currently containing over half a million articles and heavily used (Aymar 2009; Mele 2009)[6,7].

These online archives were away for scholars to communicate and share their articles in their preprint versions. Both Ginsparg (1996) and Harnard (1990)[8] were clear that these archives would serve well for royalty free literature or what Harnard referred to as esoteric scholarly publication (Okerson, 1994)[9]. Academics write and publish articles in order to communicate their results to their interested audience and for recognition in order to advance their careers. Harnard and others (Okerson, 1994) proposed that e-print archives could be used not only for preprints but also to distribute postprints, i.e. the final refreed version of the article. Once an article has been published then the preprint could be replaced with the final refreed postprint version. In this fashion all refreed scientific esoteric academic literature could be available with no barriers.

It was believed that communication of the results in the form of esoteric publication (i.e. Journal articles) could be improved using online reprint archives.

CREATION OF OAI-PMH

The arXiv preprint server became a key example of the possibilities for dissemination of scholarly material. The advent of World Wide Web

solved many of the searching, navigation and retrieval difficulties of the FTP server (Harnard, 2001)[10].

As other eprint archives were developed, such as RePEc (Research Papers in Economics) and CogPrints (Cognitive Science Eprints Archive).

(Von de Sompel and Logoze 2000)[11], issues related to interoperability between servers and cross searching were raised.

It became important to be able to exchange information between archives in order to make the eprints more accessible and searchable.

In 1999 a meeting in Santa Fe led to the establishment of the Open Archive Initiative (OAI) The Santa Fe convention is a "Combination of organizational principles and technical specifications to facilitate a minimal but potentially highly functional level of interpretability among scholarly eprint archives" (Van de Sompel and Lagoze 2000).

The OAI led to the development of OAI-PMH (Protocol for Metadata Harvesting). The important repercussions of OAI-PMH for the future developments of institutional repositories are the separation of the metadata and digital object and the choice of Dublin Core metadata as the standard. Dublin Core was selected precisely because of its simplicity as it could easily be filled out by academics themselves when they self archived their eprints. As repositors have moved away from eprints toward storing more complex non-textual objects, in particular multimedia resources, severe limitations have been found in practice with using Dublin Core to describe these resources or attempting to append additional metadata schemas. (Emly, 2007).[12]

SOFTWARE CREATION

Another outcome of the Santa Fe convention was the recognition of the importance of developing software so that institution could begin to create their own archive. (Van de Sompel and Lagoze 2000)

Based on CogPrint (Tansley and Harnard 2000)[13] developed the University of Southampton, work began on creating as easy to install software that implemented OAI standards and allowed the self archiving of eprints. According to their specifications archive should have:

- a submission mechanism
- a long term Storage System
- a management policy with regard to their submission of document and their preservation

- an open machine interface that enables the third parties to collect data from the archive. (effectively OAI-PMH) (Von de Sompel and Lagoze 2000)

In 2000 the appropriately named EPrints was launched by University of Southampton, followed by couple of year's letter by DSpace produced by MIT in conjunction with Hewlet Packard (Smith, Barton, et al 2003)[14]. This was followed by other software such as Digital Commons offered by BePress and the use of tool such as Fedora and Green stone for institutional repositories.

OPEN ACCESS

If academics around the world are archive there pre or post print articles in repositories, this would effectively illuminate access barriers to scientific literature and increase visibility and access.

The Budapest OA initiative 2001 states that by open access they mean:

"Free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, are link to the full text of this article crawl them for indexing, pass them as data to software, are use them for any other lawful purpose, without financial legal, are technical barriers other then those inspirable from gaining access to internet itself".

(Chan, Cuplinskas et al 2002)[15]

The Budapest initiative focuses on worldwide electronic distribution of the Peer-reviewed journal literature.

The Bethesda statements on OA publishing 2003, also referred to primary scientific literature "(at) least one online depositary that is repository, by an academic institution, scholarly society, government agency, are other well established organization that seeks to enable open access unrestricted distribution, interopratibility, and long term archiving". (Brown, Cable et al 2003)[16]. Issues about preservation, stewardship and long term management where introduced. It was purposed that main path toward achieving open access would be through author, self archiving.

INSTITUTIONAL REPOSATERIES AND THE REFORMATION OF SCHORALY PUBLISHING

The increased environment of libraries in the development of institutional repositories provided another fundamental shift. For the libraries struggling with increase subscription fees, movement promises to alleviate there budget woes whilst still providing universities member access to university research. Library saw in the open access movement the potential to alleviate are even resolve this crises.

OVERVIEW OF KEY INITIATIVES

Some of the major initiatives, in particular those that have led the way and served as an example for other repository project are:

In the U.K., JISC (Joint Information System Consortium) lunched, in 2002, the FAIR project (Focus on Access to Institutional Resources) to "Investigate the technical, organizational, and cultural process involved in providing access to institutional digital resources" (Awre and Baldwin 2006)[17]. Report concluded that the biggest issues to be addressed by the developers are:

- Clarity of purpose
- Quality control
- Metadata and Semantics
- Legal ethical and cultural issues
- Research cultures

Under the FAIR umbrella, fourteen repository related projects where run. One group was focused on eprints and thesis. The most relevant projects are:

ROMEO (Right, Metadata for open archiving)

SHERPA (Securing a Hybrid Environment for Research Preservation and Access)

TarDis (Targeting Academic Research for Deposit and Disclosure)

In the Netherland, ARNO (Academic Research in Netherland Online) was a project that ran from 2000-2002 in order to preserve output. Between 2003-2006 DARE (Digital Academic Repositories) worked to coordinate repository development on national scale and linked all 13 Dutch universities and 3 major academic institutions to form DARENet.

In U.S.A. currently has 325 institutional repositories nation wide and in terms of simply members more then any other country in the world.

The MIRACLE (Making Institutional Repositories a Collaborative Learning Environment) project is funded by the ILMS (Institutes of Museum & Library Services)

and investigates the development of institutional repositories in colleges and universities to identify models and best practices in administration, technical infrastructure and access to repository collection. This project begin in 2005 and originally schedule to finish in 2008 but project is not finished until August 2009, so the result can not be reviewed.

Australia is another country with important national institutional repository projects. The ARROW project (Australian Research Repositories Online to the World) identifies and tested software solution

for building repositories to handle eprints, electronic thesis and dissertations, e-research and electronic publishing.

CONCLUSION

This article focused on the shifting key objectives leading from eprint archives to institutional repositories. They main objectives of the development of institutional repositories are:

Self archiving and open access

- Pre and Post print to increase visibility of esoteric literature (i.e. research article)
- Revolutionizes prepublication (Rapid dissemination and more peer review)
- Maintain publishing system in place

(Harnard 1990, Ginsparg 1996, Harnard 2001)

Institutional repositories for revolutionizing scholarly publishing

- Digital collection capturing and preserving the intellectual output of a single and multiuniversity community.
- Critical component in reforming the system of scholarly communication.
- Indicators of university output: increasing visibility status and public value.
- Intellectual output undefined but refers only to eprints

(Crow 2002)[18]

Institutional repositories as digital infrastructure for universities

- A set of services for members of the university.
- Management dissemination and preservation of digital materials created by them.
- Increase breadth of digital materials.
- Institutional repositories are about scholarly communication, broader than just scholarly publishing.
- Support new forms of scholarly communication.

(Lynch 2003)[19]

This shows how characteristics and objectives of repositories have been modified over a time.

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Preservation of Digital Resources: Some Aspects

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ABSTRACT

Today in the information technology era, the role of Library and Information Centers are increasing. Preservation of digital resources has been a great challenge for Library & Librarians. Instance use of computer in library over past few years for access the digital resources also the challenges and problems have been raised for preservation of digital information. In this paper attempt has been made to discuss and general guidelines for introduction of digital preservation, planning of digital preservation in library, advantage and various strategies of digital preservation. It is also discussed that how can we done digital preservation in library.

Key words: Digital Library, Digital Resources, Digital Preservation

INTRODUCTION

Preservation of digital information is widely to require more constant and ongoing attention than preservation of other media. This constant input of effort, time and money to handle rapid technological and organizational advance is considered the main stumbling block for

preserving digital information. Indeed, while we are still able to read our written heritage from several thousand year ago, the digital information created merely a decade ago in serious danger of being lost, creating a digital dark age. Digital preservation can therefore be seen as the set of processes and activities that ensure continued access to information and all kinds of records scientific and cultural heritage existing in digital formats. This is includes the preservation of materials resulting from digital reformatting, but particularly information that is burn digital and has no analog counterpart. In the language of digital imaging and electronic resources, preservation is no longer just the product of a program but an ongoing process. In this regards the way of digital information is stored is important in ensuring its longevity. The long-term storage of digital information is assisted by the inclusion of preservation metadata. Further, the digital preservation refers to all the actions required to maintain access to digital materials beyond the limits of media failure or technological image. These activities are necessary to ensure continued access to digital material for as long as necessary.

OBJECTIVE OF DIGITAL PRESERVATION

Following are some important objectives which fulfill the aims of digital preservation:-

1. Digital Preservation reduces the effects of deteriorating factors.
2. Digital preservation saves the space and time.
3. To provide world wide accessibility.
4. Digital Preservation makes information services longer.
5. Digital Preservation maintains the historical value of information.

SOME GUIDELINE FOR DIGITAL PRESERVATION

Some elements of digital preservation issue are as follow:-

1. Recognizing the creator's responsibility to preserve his work initially.
2. Identifying responsibilities to the archive.
3. Adopting appropriate selection guidelines.
4. Securing archived items from international or unintentional alteration.
5. Describing digital objects completely.

DIGITAL PRESERVATION OF RESOURCES.

Digital Preservation has played an important role in libraries and information centers. It may be defined in the library context as the processes of keeping collections and the information they contain available for use as long as they are needed. In other words we can say it to bring digital information into a safe place where we can manage it and have time to make good decision about its long term preservation. Today various types source available for storage of digital information but many are not satisfied. Unstable floppy disks and individual computer systems is not a place where any particular digital resources is secure for very long. If we want to take action about digital preservation to think over the following practical things for necessary action:-

- Building the technical infrastructure.
- Establishing the mechanisms for recording the metadata.
- Moving digital resources from less stable carries like floppy disks to move stable carries like CD.
- Identifying formats for migration.
- Setting up registers of existing evaluation software.

DIGITAL PRESERVATION STRATEGIES

In 2006 the OCLC online computer library centre developed a four - point strategy for the long term preservation of digital objects that consisted of:-

(i) Assessing the risk for loss of content posed by technology variables such as commonly used proprietary file formats and software applications.

(ii) Evaluating the digital content objects to determine what type and degree of format conversion or other preservation action should applied.

(iii) Determining the appropriate metadata needed for each objects type and how it is associated with the object.

(iv) Providing access to the content

However these are several additional strategies that individuals and organization may use to actively combat the loss of digital preservation:-

1. **Refreshing** - Refreshing is the transfer of data between two type of the same storage medium so there are no bit rate changes or alteration of data for example transferring census data from on

old preservation CD to a new one. This strategy may need to be combined with migration when the software or hardware required to read the data is no longer available or is unable to understand the format of the data.
Refreshing will likely always be necessary due to the deterioration of physical media.

2. **Migration**
Migration is the transferring of data to newer system environments (Garret et al 1996). This may include conversion of resources from one file format to another for example conversion of Microsoft word to PDF document, form one operating system to another (e.g. windows to Linux) or from one programming language to another (e.g. C to Java). So the resource remains fully accessible and functional

Resources that are migrated run the risk of losing some type of functionality since newer formats may be incapable of capturing all the functionality of the original format, or the converter itself may be unable to interpret all the nuances of original format of the letter is often a concern with proprietary data formats.

3. **Replication**
Creating duplicate copies of data on one or more systems is called reflection. Data that exists as a single copy in only one location is highly vulnerable to software or hardware failure, intentional or accidental alteration, and environmental catastrophes like fire, flooding etc.
Digital data is more likely to survive if it is replicated in several locations. Replicated data may introduce difficulties in refreshing, migration, versioning and access control since the data is located in multiple places.

4. **Emulation**
Emulation is the replicating of functionality of an obsolete system. Emulation has been a popular strategy for retaining the functionality of old video game systems.

PLANNING OF DIGITAL PRESERVATION

Many measures before the digital preservation, for example

a. Selection of material
b. Digitization
c. Canonicalization
d. Replication

e. Migration
f. Emulation
g. Encapsulation

BENEFITS OF DIGITAL PRESERVATIONS OF LIBRARY RESOURCES:

Many benefits of digital preservation of library resources

1. **Digitization**
   (i) User can access the relevant information at any where.
   (ii) No need to visit the library for information.
   (iii) User can carry library sources at any where with PC and network connection.
2. **Easy Access Searching and Browsing**
   (i) Full text search
   (ii) Hyper text search
3. **Easily Access Current Information**
4. **Information to User is Available 24 Hours**
5. **Wider Access**
6. **Allows Collaboration and Exchange of Ideas**

BARRIERS OF PRESERVATION OF DIGITAL RESOURCES

1. **Technology Problems**

   Digital information totally depends on the technology and the obsolescence is one of the great problems for digital preservation the reason is

   (A) Digital components like hardware and software are changing their version and processing capacity.

   (B) Digital media can be fragile and have limited shelf life, so that the process should be taken a break cycle at 2-5 year.

   For example some of the storage is short lifetime and some other is durable storage media- Tape cartridge and reels, seven track Tapes, Floppy are short life time and CD-Rom, DVD Rom and Optical WORM are durable media.

2. **Digital and Traditional Object**

   In comparison of traditional objects, digital object have a very short life because easily to dust - catastrophic loss.

   (A) It can be affected easily to dust.

   (B) Catastrophic loss.

3. **IPR** - Intellectual property rights is also one kind of barrier for preserving the digital material because

   -Digitization generally involves the legal and practical questions of migrating intellectual property.

4. **Skillful Manpower** - Digital preservation requires the trained and skill full staffs who know about the new techniques and knowledge of computer.

5. **Budget Problems** - Digital materials are Migration of new technology more costly than printed materials because Refreshing, replication, Migration of new technology etc. processing are costly.

In the view of above problems the following measures can be taken to overcome this situation.

(i) Libraries & Information Centers have trained IT skillful staff.

(ii) Timely checking of different types of digital object or materials.

(iii) Make climate control storage facility.

(iv) Regular power supply

(v) User's orientation.

DIGITAL PRESERVATION STANDARDS

For the preservation digital document or information over time, the following types of standards are mentioned --

1. **Standards for Architecture**

   To serve as a reference model to the describe functionality of digital preservatory, infrastructure procedure and concepts.

2. **Standards for Document Format**

   In order to preserve the digital document object format plus preservation

3. **Standards for Preservation Access**

   In order to preserve the content describing the technical context, provenance and semantics, enable future interpretation of the document.

4. **Standards Interoperability**

   In order to exchange data in different platform with minimum loss of content and functionality

CONCLUSION

Digital preservation increasingly involves reproducing a work in any form. The preservation strategies are actively employed the information which the technologies are enabling to be created, manipulated, disseminated, located and started with increasing case information will rapidly become inaccessible. Today, digital information era is the basic requirement to police the knowledge of the library and Information professional and educate the new one by training, seminars and workshops. Digital preservation can handle only expertization. Knowledge of management and application of digital software can help to preserve the digital resources because of their quantum of complexities in their nature. Today mostly resources for teaching, learning, study, entertainment, research and industry are publishing in the digital formats. So we can say that the coming future is the most advanced digital or virtual era. So, it is urgent need to develop the appropriate strategy, policy service and tools for their preservation.

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Problems in Digitization and Preservation of Manuscripts - A Study

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ABSTRACT

In the treasure of knowledge known is very less from different sources. Manuscripts are one of the major cultural heritages to be known and explore. The digital era brought new avenues to preserve and publish the content of manuscripts. Still libraries hold responsibility to maintain and preserve the physical source for various reasons. The study attempts both physical manuscripts and its digitized one. Different institutions involved in manuscript digitization were taken for the purpose of study. The problems in digitization of manuscripts were evaluated and certain suggestions were made to maintain in both physical and digital media.

INTRODUCTION

Manuscripts are precious part of our cultural heritage. Great ancient scholars dedicated their lives for creating written records of knowledge. This heritage encompasses almost every aspect of human enquiry exploration and existence. Today this heritage is scattered in texts in libraries and in individual positions. This precious gift is slowly decaying and vanishing due to the improper handling. Indeed, preservation of this heritage presents a great challenge before us. The main object herewith discussed presents a focus on problems of digitization and preservation of paper and palm leaf manuscripts after conducting a study based on

three institutions situated at Tirupati namely, S.V. Digital Library, S.V. University Oriental Research Institute, Rashtriya Sanskrit Vidyapeetha (Deemed University).

Many efforts are made to preserve the manuscripts and nowadays, many agencies have carried out digitization projects.

"Digitization refers to the process of translating a piece of information such as a book, sound recording, picture or video into bits. Bits are the fundamental units of information in a computer system. Turning information into these binary digits is called digitization." The assumption is that digital collections will be more accessible to broader range of users, presumably through networking techniques, and new efficiencies are to be gained in resource sharing and preservation.

OBJECTIVES OF STUDY

The present study was conducted to know the importance and process of digitization especially manuscripts with certain objectives as

- to identify the essentials for digitization of Manuscripts
- to know the problems of digitization
- to identify the methods of preservation of the original manuscripts

METHODOLOGY

By knowing the initiation of automation and digitization in all higher learning institutions of Tirupati, this study was taken up with the help of evaluation schedules prepared for the purpose. Schedules of this type are used to visualize the problems faced by or inherent in a given type of institutions. The prepared schedules were used to record the event situations and qualitative information in different institutions in Tirupati. Each institution was personally visited and discussed about the on-going digitization in general and manuscripts in particular. The schedules was used for record the information given by the librarian or the person in-charge to the digitization activity in the institution.

MANUSCRIPTS

Manuscript is a hidden literature or knowledge to the present generation. The present human civilization is nothing but published information. The other side of the coin most of us not aware is the story of knowledge not published and remains in manuscripts. Securing, processing and protecting such invaluable documents is the primary duty of the present information systems.

TYPES OF MANUSCRIPTS

1. Palm Leaf, 2. Birch Bark, 3. Sancipat or Samucipat, 4. Paper, 5. Tulipateeya[1]

Other Types under Metal and Non-Metal Categories

Copper, Silver, Brass, Bronze, Iron and Tin fall under metals category. While Stone, Earthenware (Bricks, Pots etc.), Leather, Ivory, Cotton, Wood can be classified under non-metals category.

The scope of this topic is covered only for palm leaf and paper manuscripts.

DIGITIZATION

Digitization is a modern way for preservation of documents with the help of Information Technology. As it is has become a very essential one, now-a-days it can be noted it is much more essential for non-book materials like manuscripts. As the longevity of manuscripts cannot be decided, we are forced to digitize them keeping in view of its value.

PILOT PROJECTS IN DIGITIZATION

There are many libraries who are undertaking various preservation activities regarding digitization under Pilot Projects[2] in various countries such as in Prague, Memoria de Iberoamerica, Manuscript of Kandili observatory, Memory of Russia, and The Sana's Manuscripts.

DIGITIZATION OF MANUSCRIPTS IN INDIA

National Mission for Manuscripts, New Delhi, Jayakar Library, University of Pune, Pune, Centre for Development of Advanced Computing, (CDAC), Hyderabad, and Academy of Sanskrit Research, Melkote (Karnataka) are some of the Institutes of our country which are trying to digitize manuscripts. Some of these have also done a Pilot Project in this regard.

TRADITIONAL PRESERVATION METHODS

When it comes to the aspect of building where the manuscripts are stored, scientific storage steps are followed, the requirements of archival building must be properly planned with ideal storage conditions. Under ideal storage conditions the factors like control of heat and temperature, control of humidity, dust free storage area, proper air circulation. Storage and storing materials in shelving pollution free stack areas and anti pollution strategies planning of anti light strategies, strategies for fire detection and control, preventive care against living organisms (like insects, fungus, rodents etc.).

Tail¡drakÀ®t Jal¡drakÀ®t RakÀ®t áithilabandhan¡t .
M£rkhahast® Na D¡tavyaÆ Vadati Pustakam

'Protect from oil (fire), protect from the water, protect from loose tying, Please do not hand over to me to the careless-fools – So says the Manuscript '.[3]

' A manuscript must be

- decked as like one's beloved child
- guarded from others like one's virtuous wife
- carefully treated like an injured limb in the body
- looked up everyday like a friend
- tied strongly like a prisoner
- always remembered like Lord's name

Then only the manuscript will not perish. These are instructions of our forefathers'.[4]

ESSENTIALS IN DIGITIZATION OF MANUSCRIPTS

In order to digitize manuscripts, one must have a proper plan or project. The very first one, it is essential to assess the original materials to identify the unique characteristics of the collection. There are the key things which decide about the storage quantity, quality etc. and the activities which are involved in digitization[5] are assessment and selection of originals, grant applications and fund raising, feasibility testing, costing and piloting, copyright clearance rights management, preparation of materials, benchmarking, digital capture, quality assessment, metadata design and creation, delivery, workflow processes, project management and long term preservation.

Project must be planned according to the digital imaging processes in the way it create resources which in turn fulfil the goals and purposes.

For The **successful running of a digitization project** is based on financial, political and strategic implications, which are to be the factors to be dealt with utmost care.

The **risk in managing a digitization project** may be Due to lack of good planning and some risk management tools, prices escalate and the projects could not be completed in the scheduled time.

Pilot Study helps to check the quality assurance. It also helps in defining the technical parameters with variations in the standard of product creator.

THE ADVISORY COMMITTEE

The advisory committee[6] must consist of discipline specialists, education specialists, digitizing specialists such as photographic laboratory staff, librarians, archivists, curators, researchers experienced in working with

online resources, conservators and preservation specialists and finally lawyers.

Delivery of Materials plays a key role in a digitization project before starting a digitization project. Some of the key issues covered under this aspect are Graphic Design, Amount of information, Organization of information, Types of metadata, Types of media and Accessibility.

After this **evaluation** can be made at the initial stage, middle stage (when work is in progress) and at the last stage i.e. on the completion of project.[7]

Assessment and Preparation of Materials for Scanning

Generally, one must have an idea about the materials to be scanned. The factors like shape, size and condition of the originals are to be assessed and prepared.

Digitization of Manuscripts In Tirupati Libraries

At present, the digitization is done at the following scanning centres:

S.V.Digital Library, TTD, Tirupati, Oriental Research Institute, S.V.University, Tirupati, Rashtriya Sanskrit Vidyapeetha, Tirupati.

S.V.Digital Library, T.T.D., Tirupati

This Library is functioning in S.V.Central Library and Research Centre which is maintained by Tirumala Tirupati Devasthanams (T.T.D.), Tirupati[8] from September, 2001. The digitization work is done with collaboration of Universal Library, Carnegie Mellon University, Pittsburgh, U.S.A. The web site of URL is **www.dli.iiit.ac.in** and the materials can be browsed online, but are not permitted to copy. This has a budget estimate of Rs.5 Crores. The scope of Universal Library is to scan one million books. Till now, they have scanned at about 3000 paper manuscripts.

Sri Venkateswara University Oriental Research Institute (S.V.U.O.R.I.), Tirupati

The Oriental Research Institute (O.R.I.) was established in 1936 by Tirumala Tirupati Devasthanams (TTD). It was later handed over to S.V.University in 1956 as the very first department. The total collection consists of 19,000 Palm Leaf and 5,000 Paper manuscripts. The total available are 14,000 approximately. Here, in the O.R.I. manuscripts are digitized by S.V.Digital Library, Sub-scanning centre. At present, about 3000 paper and 100 Palm Leaf manuscripts and were scanned through HP Image editor same as scanner.

Rashtriya Sanskrit Vidyapeetha (Deemed University), Tirupati

The Library of the Vidyapeetha possess many valuable rare books related to various branches of Sanskrit Literature. The total collection of books

is 87,700. Out of which 82,050 are automated and made available on OPAC (Online Public Access Catalogue) for the users. The manuscripts section is also a part of the library.

In this library, the manuscripts are collected and preserved in the manuscripts section. There are at about 3800 Manuscripts (3300 Palm Leaf + 500 Paper Manuscripts) with 8000 titles approximately in different scripts like Grantha, Nandi Nagari, Telugu Kannada, Maithili, Bengali, Tigalari, Devanagari etc. Three Palm Leaf Manuscripts were digitized as a Pilot Project for digitization for manuscripts.

PROBLEMS IN DIGITAL COLLECTION DEVELOPMENT

When coming to the aspect related to digital collection development, in case of printed books the copyright act became a major barrier and in case of manuscripts it was found that difficulty was faced in identifying of manuscripts duplicated (re-copied) to original. Restoring the originality of the objects after digitization can be also mentioned here. After scanning 50 per cent books were in worse condition.

PROBLEMS IN DIGITAL PRESERVATION

Access and Retrieval: There is an immediate need to formulate the policy for access to the digital preservation. The policy usually depends upon the objectives of the institution responsible for digitization. Some of the archives at present is available either free or licensed. It may not be the permanent forever in the globalization and open market environment.

Manpower: There is no adequate manpower to carry the work at present.

Training: There is no authorized institution or system to train the manpower. **Funding**: All the institutions have expressed they don't have sufficient funding.

Infrastructure: Adequate infrastructure is also not found for access and retrieval.

Policy Making: The policy making and functional analysis and reporting system is an immediate need for all digitization projects at Tirupati.

Storage: Strategic storage methods and systems are essential.

Suggestions

It can be summarized to suggest as the digitization without affecting the originality of the object to a maximum extent. Proper attention may be paid towards selection of objects to be digitized. Further research in preservation and storage is essential.

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The Digitalized Library of India: A Project

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ABSTRACT

In this paper we share the experience gained from establishing a process and a supporting architecture for the Digitalized Library of India, project. The Digital Library project was started with a vision of digitizing books, map, educational video and making them available online, in a searchable and browseable form the digitization of the books takes place at geographically distributed locations. This raises many issues related to policy and collaboration. We discuss these problems in detail and present the process and workflow that is established to solve them. We also share the architecture of the project that supports the smooth implementation of the process.

Keywords: digital library, digital library architecture, Digitalization of Library .

INTRODUCTION

The digital library is an electronic or virtual library where information is selected, acquired, processed, organised, stored and retrieved in digital form. The developed countries have already digitized their libraries. The developing countries are in the process of digitization of their libraries. The users of digital libraries are the universal users who should have facility to access to all created and acquired digital sources of information in the form of electronic text, image, map, sound, video and multimedia. Thus the digital libraries are attributed to electronic databases and capable of handling large data and servicing users effectively in resource sharing environment. Digital Libraries have received wide attention in the recent years allowing access to digital

information from anywhere across the world. digitization of printed documents in the past few years.

WHAT IS DIGITAL LIBRARY

We understand a digital library to be an electronic collection of real or virtual resources, which may also be available elsewhere. These resources must be whole works, with which humans can have a complete cognitive or affective engagement. A digital library may allow either online or offline access to the elements it organizes and houses, and may include multimedia as well as multilingual data. Although accessible online, a digital library is not identical to a website or a portal. However, while portals, specialized websites and search engines cover a wide range of subject areas, digital libraries are more narrowly focused around one or a specific group of disciplines. Digital libraries, moreover, attach content specific and highly descriptive metadata such as, descriptors or keywords to describe each item in the collection. Therefore, searches in a digital library can produce more useful results, save time and effort in searching, and in the best of cases browsers may directly access the text or multimedia content for which they executed their search.

With a vision of digitizing a million books by 2008, the Digitalized library of India , project aims to digitally preserve all the significant literary, artistic and scientific works of people and make it freely available to anyone, anytime, from any corner of the world, for education, research and also for appreciation by our future generations. Ever since its inception in November, 2002 operating at three centers, the project has been successfully digitizing books, which are a dominant store of knowledge and culture.

Traditionally, digital libraries work in a closed environment and contain the process information and the content in a local repository. Although doing so increases the ease of server management and administration along with simpler resolution of process oriented issues, such an isolated set up does not scale up easily or promote collaboration across geographically distributed points of operation. This adds unacceptable delays in the implementation of the project. In projects like the Digitalized Library of India with such ambitious missions, a distributed environment becomes a requisite. There are discrete phases and chunks of work, which need not be collocated for operation. For example the process of scanning books can take place at one place while the image processing and web-enabling of the same could occur at a different place. Also with some planning both these tasks could go on concurrently at different places on different consignments of books in turn yielding a higher throughput. In the Digitalized library project, we have established a flexible, yet cohesive, process that automates the entire workflow in a distributed environment. In doing so we have confronted a few problems

and issues starting from the selection of books for digitizing, operating and establishing a protocol for being free from effort duplication, producing digital output of good quality and preservation of the digitized book objects for access in a user friendly, reliable and highly available manner.

In this paper we describe the experience gained from establishing a process involving an efficient workflow and effective policies and deploying a scalable, distributed architecture for the Digitalized Library of India project. We suppose that the same can be successfully applied to other similar digital libraries and digitization systems. We also attempt at throwing light on some unforeseen problems in the digitization process and issues of collaboration in a distributed environment.

The rest of the paper is organized as follows. In section 2, we give an overview of the project and its organization. In section 3, we discuss the problems and challenges that we experienced in the course of the digitization and web-enablement of books. In section 4, we discuss the process established in the project that has helped us address a few of the aforementioned problems. Section 5, discusses the architecture that addresses the issue of reliable web access of digitized content and supports the Digitization of Library process and we conclude in section 6.

OVERVIEW OF THE PROJECT

The Digitalized Library of India project was initiated in the year 2002, with motivations from the Universal Digital Library project. The project currently digitizes and preserves books, though one of the future avenues is to preserve existing digital media of different formats like video, audio etc. The scanning operations and reservation of digital data takes place at different centers across India, Regional Mega Scanning Center (RMSC). The RMSCs themselves function as individual organizations with scanning units established at several locations in the region. Responsibilities of a RMSC include regulating the processes of procuring or collecting the books, distributing across scanning locations maintained by it, gathering back the digitized content from the contractors operating at those locations and hosting the same. Hence the Digitalized library project is a congregation of RMSCs, operating parallely and independently at distributed regions across India. The major responsibilities of the management at the Digitalized Library are to monitor the progress of the RMSCs and supply the resources necessary for its operation. We also have a contractor team which complements the setup at an RMSC. The contractor team comprises of a set of contractors who operate in the scanning locations maintained by the RMSC and have a trained personnel to execute the scanning and image processing operations. In such a highly decentralized and distributed environment,

the Digitalized library project has evolved and has been successfully producing high quality digitization of books.

PROBLEMS AND CHALLENGES

In this section we present a few important operational and policy related problems and challenges that we experienced in the project. There are several appreciated research challenges in the area of digital libraries like information retrieval, multi lingual support etc, but these are not the scope of this section.

1. Procurement of Books

The motivation in the Digitalized library of India project has so far been to preserve the rich and affluent culture and heritage of India, that is only captured in the paper and book media. As we are stepping a few milestones we realize that user profiling and usage statistics will turn out to be a promising factor in the success of any digital library. Within the number of books that have so far been enabled for online usage, we discovered from the usage logs that about 80% of the books are not accessed most of the time. Hence, considerable attention needs to be paid towards identifying and procuring books that are useful to broader communities of people. Yet another problem is that many people do not agree to the fact that digitization is the only way of preserving the books. Some are apprehensive about the possible rough use and the resultant damage to the books by the scanning centre staff particularly for the old books and palm leave manuscripts.

2. Incomplete and Incorrect Metadata

Most of the books scanned in the project are procured from sources like libraries and government archives and hence contain metadata entered by knowledgeable personnel which can be relied upon, but is still debatable due to individual biases. However a major portion of the sources of books in the project have metadata only in non-digital formats and so these have to be fed manually. This process though inevitable is understood to be prone to errors. Due to this varied sources of book flow in the Digitalized Library project in multiple languages and due to the lack of standard formats, metadata is missing, incorrect or incomplete or sometimes difficult to interpret. Inaccurate metadata hinders fruitful search and retrieval of books, categorization and at the same time brings in scope for duplicate entries of the same book.

3. Duplication

As mentioned earlier, due to the varied sources of books, like libraries, government organizations, institutions and personal collections that are distributed across various parts of the country, duplicates could arise between scanning locations maintained by an RMSC and also across

different RMSCs. Effort put into scanning a book, processing the images and quality assurance can not be afforded to be spent on duplicates. Communicating metadata across centers and within scanning locations is important. The duplication of the books can be identified only using metadata of a book like the title, author, publishing year, edition, etc. However, if the metadata is incorrect, missing or incomplete as discussed in the previous section, it makes the duplicate detection all the more difficult.

4. Data Management

Assembling the data and making it available for easy access is one of the most important phases of any digitization project. Each Mega scanning centre is responsible for gathering the metadata and the scanned content from the contractors operating at its scanning locations. This data is to be enabled on the web and also preserved for future. Enabling many tera bytes of data for access to everyone in a highly reliable manner is needed for the success of the efforts put into the digitization process. Also data synchronization and management across centers needs to be done to reduce duplication and ensure reliable high availability and immediate recovery in the event of storage media failures and server failures. Finally, digital preservation of the collections for a long future still remains a very significant problem faced by any digital library.

PROCESS AND WORKFLOW

Most of the problems mentioned in the above section have been addressed by adhering to a rigid process and by establishing a scalable and interoperable software architecture. The process and the workflow includes several committees with individual responsibilities. In this section we first talk about the categorization and storage schema of metadata that is used at Digital library project, then discuss the workflow, the committees and the policies that have assured a high quality output from the Digital library project.

1. Metadata

Metadata, or "data about data," is a critical element for searching information through a database especially, when the information available in an invisible space like the Internet, unlike a conventional library. Metadata are also types of descriptive information applied to a digital spatial file. The function of metadata is to standardize the structure and content of indexing or cataloging information. Conventional libraries practice Meta data standardizations in the form of non-automated taxonomical systems.

The process at Digitalization of library is metadata centric. Every book that is scanned and stored is associated with metadata for identification

and search and retrieval. Identifying the metadata that should be preserved along with the digital objects is a debatable topic. At Digitalized library project we had several discussions as to what is the right schema for metadata of a book and finally narrowed down on the following three sub-categorizations.

I. Regular Metadata

Regular metadata contains information about the book like title, author, date of publication, publisher, ISBN, keywords, subject, language etc. We follow the widely understood and accepted Dublin core2 format and extended with a few extra fields like edition information of the book etc. This metadata primarily helps us to identify, categorize and retrieve the book.

II. Administrative Metadata

Administrative details of the book, like the location of scanning of a book, the source of the book, details of scanning of book etc may not be of interest to the book readers but are useful to the operational organization. It can be used to trace the progress of the project, generate reports and identify bottlenecks in scanning process etc. For example, we could trace the scanner producing low quality scans etc.

III. Structural Metadata

We have adapted the structural metadata concept proposed for a book object in our digitalized library of India. This metadata contains information pertaining to each page like the size of each page, whether the page is blank, or has an important context attached to it like the beginning of chapter, end of chapter, index, preface, table of contents etc. Such information enables us to improve the navigation of the end user through the book and also improve search and retrieval systems. Each digital book object contains all three forms of metadata. Regular metadata is entered by source librarians or the contractor hired librarians before digitization begins. Admin metadata is gathered at the contractor end during the process of digitization. Structural metadata is manually entered by the contractor and also automatically detected by learning techniques, although the heterogeneity of the structure of pages in a book prevent complete automated detection.

2. Workflow

Procurement team identifies the books to be digitized. The books are then directly shipped to various scanning locations operated under an RMSC. The digitalized of a book starts with an expert librarian entering the regular metadata for the books that need to be scanned. The metadata is first uploaded onto the Digitalized library portal hosted at the RMSC

for checking of possible duplicates from else where at other scanning locations. However due to a continuous flow of books from libraries all over, a significant overlap is expected not only between scanning locations but also across RMSCs. Hence the uploaded metadata has to be synchronized with the other RMSC databases and then duplicates are detected in the assuming the metadata is legitimate. Books are then digitized by the contractor and given back to the RMSC under which he operates. The product is tested for quality standards and approved for upload onto the servers.

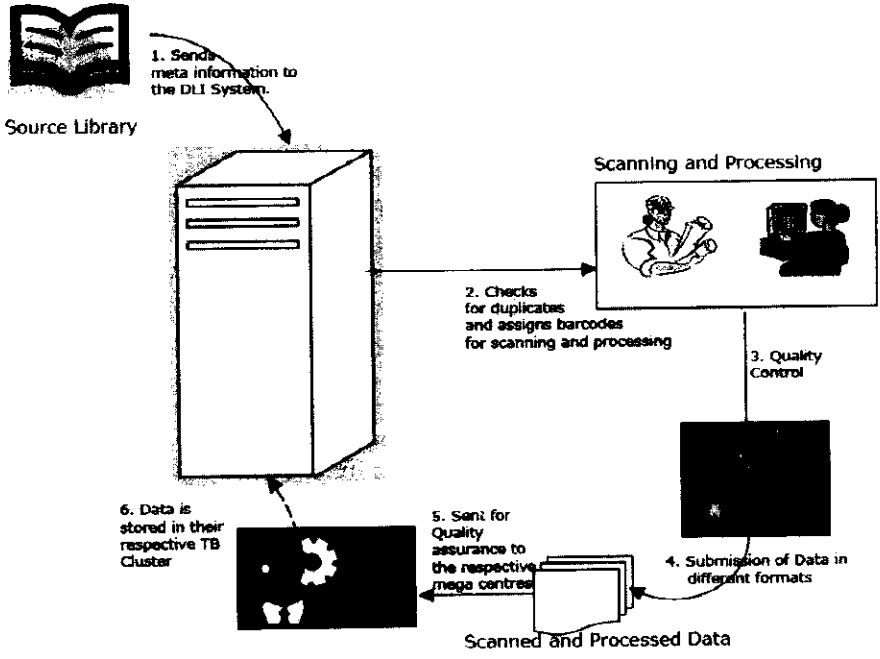


Figure.1. Process and Work flow in the DLI Project

3. Team Organization

The following three teams play a major role in the workflow of Digitalized library project.

I. Procurement Team

Identifying and procuring rare monumental works is the responsibility of the procurement committee. It approves books that are useful for a wider range of communities. Usage statistics of the already online books are collected from the system log files and given for the inspection of the procurement committee. The procurement committee uses them to decide upon the books to be procured and scanned. It is also responsible

for handling issues related to copyright and intellectual property of the books.

II. Metadata team:

This team consisting of librarians and technicians responsible for the entry and validation of the metadata. Since books are scanned from multiple locations and libraries through out India, we need librarians who can understand different languages and have a diverse knowledge on various subjects. Usually the metadata is verified by remotely distributed librarians who can log in to the system and make necessary corrections over the web. Automated identification and correction of metadata using statistical techniques and human feedback has also been yielding successful results.

III. Quality Assurance team:

This team verifies the digitized content returned from the contractors and approves for uploading and hosting on the web. They perform the check for duplicates, improper scans, damaged pages, missing pages, file formats and a few other parameters to ensure that the quality standards defined in the DLI are met. Administrative issues regarding the decision making of the undefined errors found in the digitized books and content is also made by this team. The team also ensures the process is carried out in the defined manner and performs process audits for applying the improvement strategies.

4. Policies

The following are a few policies followed in the Digitization project to improve the process and workflow in turn improving the quality of the product:

I. Peer reviews

Peer reviews are quite useful in research and educational purposes and is also adopted as a good practice by the source software engineering community. Peer reviews are conducted amongst the contractors during which the contractors and the management sit together to discuss and critique constructively on their work, responsibilities and the output produced.

II. Expertise exchange

To be up to date with the results of research and improving technology, the tools and resources that are developed at various centers and academic institutions are shared periodically. Workshops and training sessions are conducted discuss the tools and to train the personnel concerned.

III. Process Reviews

Project personnel involved in the decision making process, meet to conduct process reviews and debug the process based on feedback from the various active teams and committees.

5. Architecture of Digitalized of Library Project

In this section we describe our architecture that supports the process and the workflow discussed in the earlier sections. The architecture of the Digitalized library project is similar motivated by factors like scalability, ease of maintenance, dependability and economy. All the tools and technologies used in the project are free software. Many issues like interoperability, collaboration arise due to the multitude of books and languages that are scanned at the various scanning locations and the differences in the infrastructures used top reserve these digital objects. We solve this by deploying a distributed decentralized architecture for the DLI project and by modularizing the tasks, using technologies like XML, Databases, Web services etc. First we talk about the architecture of the DLI portal hosted at each Mega center (DLI-RMSC) and then propose an architecture for organizing these individual portals in a decentralized and service oriented manner to ensure a highly available and dependable Digital library system.

1. Architecture of Digitalization of Library at a Regional Mega Scanning Centre

Each Mega centre hosts the books that are scanned in the locations maintained by it. Currently there are three operational mega centers. The architecture adapted by each RMSC is similar to the one shown in Figure 2. The digital objects are preserved on Terabyte servers which are clustered as a data farm. Each server in the data cluster hosts all the digital objects preserved on it, through an Apache web server. The cluster is powered by Linux and enhanced by LTSP3, an add on package for Linux that supports diskless network booting. This option of diskless network booting helps us boot a server without having to devote any space for storing the system specific and operating system files. This set up is economical and and also easy to manage, in a way that we can add or replaced at a nodes in the cluster instantaneously without the need for operating system installations and configurations. We have customized the kernel in LTSP to support hard disk recognition and usb hot plug, and to run a light weight Apache web server.

As shown in the Figure 2 the 'Linux Loader' machine runs a copy of this distribution of the Linux with LTSP. Each data server in the data cluster downloads the kernel over the private intranet and boots from it. The servers implement a hardware based RAID to contain disk failures which adds to the reliability of the system. Also a redundant copy of the

complete data is present on external storage media, for data restoration in the event of irrecoverable crashes.

The complete metadata which is in XML. XML has been chosen for its important role in inter operability. Metadata is passed on constantly between contractors and the RMSC, and it also acts as an identifier of the book that is to be scanned. Using XML as the format, modularizes the work by decoupling RMSC and contractors and also ensures smooth interoperability. Wrappers present on the metadata server automatically populate the database from the xml metadata. Along with the metadata of the book, the database also contains pointers to the location of the book in the data cluster.

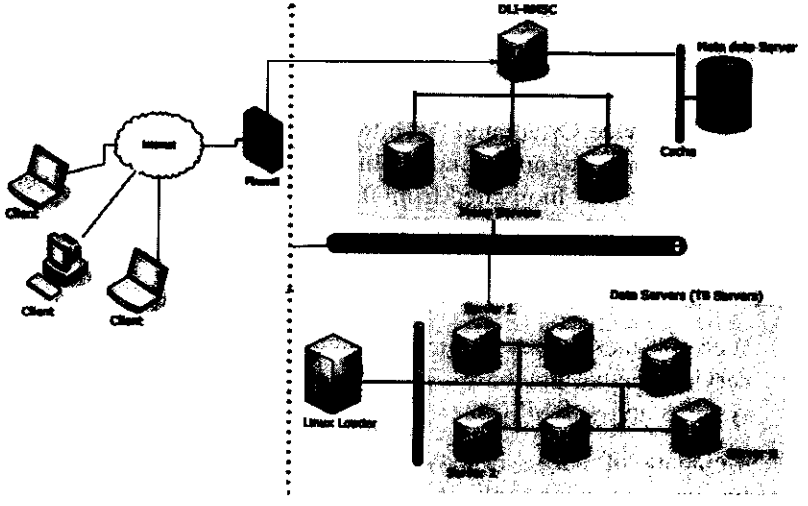


Figure.2. Architecture of the DLI hosted at a Regional Mega Scanning Centre

The portal has a front end using which a user can login and query on the metadata to retrieve books he wishes to read online. A caching mechanism deployed on the metadata server helps us cache similar queries posed to the database and return the results promptly. When a user requests to view the complete book content, the location of the book in the data cluster is gathered from the database and content is retrieved over http requests, from the particular server in the cluster and is broadcast to the user. The 'proxy servers layer' between the Data cluster and the DLI-RMSC portal also has a caching mechanism enabled that handles repeated requests to the book pages and ensures quick response times. Books are also preserved in text format which is searchable. The search is now only limited to books in English language, due to non availability of optical character recognizers for other languages.

2. Distributed Architecture of the Digitized Library Project

The scanning operations of Digitalization take place at different locations in which the RMSC operates and the digital data from its region is accumulated to be hosted online. The Digitalization as such follows a distributed and decentralized architecture with each RMSC as an independently operating node. Decentralized architectures by definition avoid having central points, as they are candidate single points of failure and a performance bottleneck. However, since the digitization process is a cumbersome process, the data that is the end product of the process is very sacred. Hence redundancy is always advised in a data centric project like Digitization of Library in India and therefore every RMSC which is a node in the decentralized architecture of Digital library hosts the complete data from the other nodes. Synchronization of complete book content between nodes is currently by physical transfer of Terabytes of information between the RMSCs.

We propose a Service Orientated Architecture (SOA) (see Figure 3), for smooth interaction between the nodes in the decentralized architecture. The core architecture is motivated from that of Google, and we adapt and extend the same to suit the requirements of Digitalization. The following are a few advantages of the decentralized and SOA architecture of the Digitalization:

- Web services address issues of interoperability that arise due to varying media, databases, languages, middleware and operating systems across RMSCs.
- Metadata of books is synchronized between RMSCs via web services, on a periodic basis. This also helps in duplication verification across RMSCs.
- Other specific features like copyright information verification, statistical reports etc can also be exposed by the RMSCs and can be utilized across the Digitalized library project via web services.

A user can login to the central site and request to read books online at which point he is redirected to one of the closest RMSCs and be served from there. This ensures quick response times for the user and also reduces to some extent load on any one set of servers

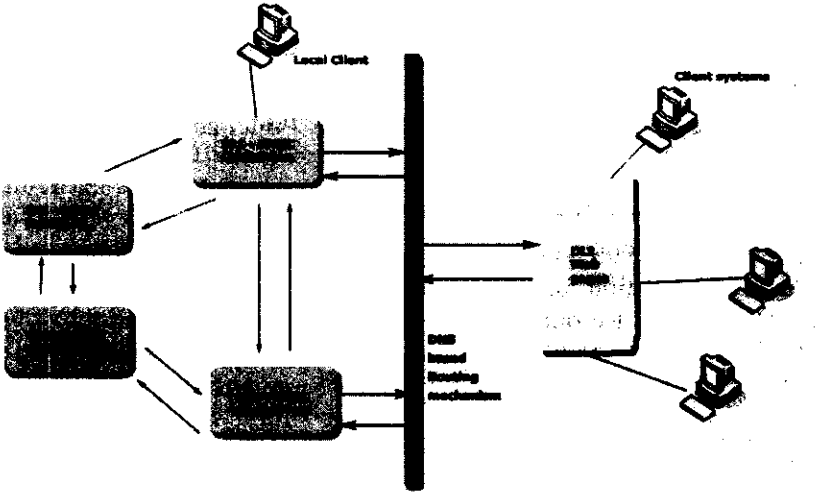


Figure.3. Decentralized SOA based Architecture of DLI

CONCLUSIONS

In this paper, we have discussed a few issues and problems faced in running a large scale digitization project like the DLI and shared our experiences in handling them. Also we have given an overview of our process, policies and workflow and described the architecture that ensures a smooth deployment of the process.

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User Education in Promoting and Supporting Digital Information Services in Modern Era

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ABSTRACT

The paper discuss the importance of instructions and methods of Orientation Programmes in an academic Libraries in making the users to know how to utilize the resources to the maximum extent possible. Library Orientation Programmes are essential, for the libraries in the changed digital environment. Information is a basic resource for-all human beings and it is importance as good as food, air and water. The tremendous exponential growth of information and knowledge in the present era has made the task of library and information science professionals more challenging for providing the right information to the right user at the right appropriate time. The convictions that 'information is for use' and 'every information has its user; which is also true vice-versa, have obliged libraries to mould themselves in different fashions to cater to the needs of users over the last five decades.

INTRODUCTION

In a modern academic library, which is a dynamic information storage and retrieve center, the literature explosion on different disciplines, innumerable reading materials, in various formats including conventional and non-conventional are collected, processed and arranged systematically. The traditional library tools become considerably effective in providing specific information of as individual interest. The student and, other user community find difficulty in searching information due to lack of awareness about the collection and the services how to use them. Therefore they fail to trace the required information, collection and services available in the library. In academic libraries most of the research work is being duplicated, due to lack of

awareness of information tools. So training in the use of information tools is essential for every user. Thus the need to educate the users in the utilization of resources has always been recognised.' In the current Scenario the advent of computerisation and IT applications in the libraries is essential to orient the users in the efficient use of these modern tools to access information quickly.

Most of the information produced at global level is going waste due to lack of awareness how to use them. In the present scenario the traditional system of class room instructions with in the four walls is shifted to library based study for this purpose educating the user through orientation is essential in the 21st century about the several changes and taken place in storing and handling, the information.

UNESCO and other National Information bodies paying special attention over the past few years in giving programmes to user for maximum utilization of various information services.

NEED AND IMPORTANCE OF USER EDUCATION

User Education means educating the users of a library to make use of the reading materials in greatest extent. Educating the users would introduce them to the right methods that would enable them to use libraries more effectively in research and development. Majority of the library users are unable to locate the library collection effectively. Library staff should concentration codifying knowledge which the user remain unknown.

Even in the traditional type of libraries students face difficulty in consulting catalogues, locating the documents and relevant reference tools available in the library. In automatical libraries even faculty members may face some internal difficulty in searching information. To over come this difficulty libraries and information centers should provide orientation to the users.

In view of the exponential growth of literature in various fields, no single library how self sufficient it may be can not meet the needs of users. This has necessitated the need for networking between various libraries and information centers. The awareness of information networking among libraries for 1C is significant with the result the user is able to find out the required information on appropriate time.(Indian journal of information library and society,1991)

User Education is powerful unifying force linking together the vast resources of information and the user of the information. User Education involves the total interaction of the library. Orientation programme is a bridge to meet two ends, at one side the library resources and services and on the other side the students needs. The needs of such programmes are

1. To acquire the academic learning techniques
2. To increase the academic performance of students community
3. To help in quick division making and problem solving.
4. To make user independence in library use
5. To conserve the potentiality of the user and their man hours and time saved in pursuit of knowledge which are otherwise wasted.

The library need to conduct orientation course to the Freshers and Faculty members. Research Scholars in the use of computers, OPAC system, library rules and regulations, services and system of the library and how to search and retrieve the information effectively. It is helpful and develop good relationship between authorities and readers to maximise utilisation of library resources.(Girija kumar and Krishan Kumar,1983)

LEVELS OF USER EDUCATING PROGRAMME:

User Education Programme can be provided in three levels such as library orientation, subject orientation and literature search training.

1. Library orientation is part of User Education Programme, user education consists of library orientation and bibliographic instructions. Library orientation is the first level and bibliographic instructions is the second level. Orientation is given in the beginning, but bibliographic instructions come later.

Krishan kumar defines library orientation is to introducing the user to the library so that they can aware of physical location of different sections, staff, collections and services.

2. Subject oriented Instructions;

In this level instructions given to users more in-depth explanation of specific library materials and search of literature, techniques of using indexes and how to search reference material such as dissertations, thesis, reports etc.

3. Literature Search Training:

The third stage is advanced one, in which the users are trained in the information search skills in all types of literature like primary, secondary and territory sources of information and how to select the research topics, method of citing reference, style of writing dissertations/projects/thesis and selection of books research communications and how to search the information on internet and how to use the search engines. Data bases etc. may be included in this stage. (Girija Kumar and Krishan Kumar, 1983)

COMPUTERISATION OF THE LIBRARY SERVICES

The rapid growth in information technology has changed the functioning of the libraries. The library is the nodal point on INFLIBNET, a UGC supported network. The data entry of books, periodicals, theses and dissertations has been completed at the main libraries and college libraries and information centers. Data base information system is to develop and replace the traditional card catalogue system for identification and location of documents available in the library in this electronic era. The library is applying information technology in the following areas, (Sehgal,1985)

Internet & E-mail services

OPAC

Network services

CAS/SDI Services

Internet and E-mail services

Libraries are providing Internet facility to students, faculty and research scholars. It is a tool allows the teachers, students, and Researches to communicate with other. It is being used for projects, tele-teaching and tele-learning. A number of Universities and colleges in the world have registered in the programme.

Internet is suitable medium for accessing selecting and using resources through web site, the web site contains a variety of resources, such as Bibliographical data, dictionaries, encyclopedias, directories. Web users can obtain answers quickly conveniently and directly to a large number of queries.

The internet has become an expert tool for searching and satisfy the user needs. Internet is the global information infrastructure which enables to access the information and communicate to others cost-effectively through multimedia.

Libraries are using internet for all activities such as acquisition, classification, cataloging, resource sharing, reference services, database access, user education etc and using the E-Mail the researchers can request for inter library loan Document deliver services etc. There are number of bibliographic data bases available on the net. Most' of libraries use commercial document delivery services to ensure quick and efficient access to primary information especially for the researchers. Most online search services like DIALOG, ESA/IRS and STN have been offering document supply services to the users. The development of information technology have influenced implementation of OPAC available through the Internet. In order to search and browse the library catalogue, the end

users can transmit orders or request directly from the web OPACs. Several libraries are offering digital reference service using chat software line interactive communication activities etc.

CD - ROM Search Services:

The library provides abstracting indexing services through CD-ROMs. CD-ROM databases are the best, powerful and cost-effective tools for information storage and retrieval. Information that can be stored and retrieved in a CD-ROM can be of different forms like textual, audio, video. Salient features of CD-ROM searches are:

1. Search can be made quickly and efficiently in free text mode and by using field qualifier namely author, keyword, journal title publishers, year of publication etc.
2. Boolean operators like AND, OR, NOT, can be used to broaden or limit the search. The search so made can be displayed printed and even downloaded

The library subscribes CD-ROM databases and information packages, which not only minimises the subscription costs, but also facilitates quick speedly search strategy to Researchers.

Net work services:

The networking can be defined as the combination of more than one computer, which are interlinked together for data communication. Computer networks plays an important role in activities of libraries and information centers. Information services like reference services, CAS, SDI, Computer assisted learning and User Education are feasible with the help of computers beside the house keeping operations.

OPAC: OPAC provides public enquiry terminals thereby bringing about considerable improved literature and information available in the internet they can be grouped as follows.

News Papers: Several news papers have been made available on the web. They can be auessed with the Subject -title, Date, language. Name of the author etc. In addition to the News papers the Government publications. Latest G.Os and amendments can also obtained from websites of individual agencies of such as GPO, FBI.

Journals : Now a days most of the libraries and information centers are maintaining and electronic aids which consists of lists of electronic data bases and e-journals on their web site a part form the on line catalogue. Useful textual matters of certain journals will be down loaded on going through content pages by the scholars for their research work.

RESOURCE SHARING:

With the development of electronic information network and the internet in-particular has provided a wide range of opportunities in sharing the access of information. Resource sharing is a way to maximize user satisfaction at lower cost. In India, some positive effort have been made by some of the networks like INFLIBNET, DELNET, SIRNET, CALIBNET etc.

Library and information centers must adopt appropriate techniques for storing, manipulating and disseminating information. They should plan to develop the technology of systems for communicating information following the below.

1. Comprehensive professional training programme, with emphasis on IT should be introduced to serve the changing society based on information technology of the 21st century.
2. User education and training programme is essential to put library resources and services to efficient and effective use. It helps the library professionals in getting feedback for providing further information in relevant fields.
3. A through investigation of users needs must be carried out in the reference or information desk so that the design of appropriate information products can be accomplished to extend better information services.

Every library must provide user orientation programme to know about different services, CAS, SDI, DDS, collection etc. so that, readers can get acquainted with the library system to enable them to retrieve the information.(University News,2001)

USER EDUCATION IN DIGITIZED ENVIRONMENT:

With the advent of computer applications and the introduction of online public access catalogue system in the library, the need to conduct orientation course to instruct and familiarise the freshers in the use of computers and OPAC system has become a compulsion rather than a choice. Further with the number of academic libraries going in a big way for IT based application;; with a view to provide new services , the orientation programme has become inevitable . Many libraries acquire CD-ROMS instead of hard copies of bulky, unwieldy reference materials. (Census publications. Encyclopedia, Abstracts, current contents etc).

The introduction of internet and multimedia systems in the libraries, made it imperative that the users be familiarised with this technology for exploiting it. The users can get any information from any where in the

world, with the click of the mouse without moving from their desk. Now the most frequently discussed topic in the field of library and information science is the concept of virtual library. In a virtual library environment, users never need to physically visit a library. Instead the user can tour the stack area, pick book of choice and flick through it, and finally down load the pages required at his desk. The question then arise, whether orientation course is necessary at all, as user can search and retrieve the information on his own.

METHODS OF ORIENTATION

The method of orientation is to make aware the user to know about the layout of library and what classification, cataloging, circulation system being followed the various services being offered. The OPAC system organisation and search strategy is explained along with hands on training to each student on the systems available in the lab. Explanation and training regarding internet search strategy is also provided.

After the above exercises the students are taken on an extensive tour of the library in order to introduce them to various sections and the services, stack area circulation desk etc. In the stack area, the organization and arrangement of books, journals and how to search and retrieve them are demonstrated. At the circulation desk the issue and return methodology is also demonstrated. Finally, each student/reader is provided a set of brochure (automation activities, library rules and OPAC). The brochure on library automation provides brief details regarding the university library or information centers, the efforts to automate the house keeping activities, the software selection, the database building etc. Further, the details regarding the library network, Bar code technology, application, OPAC system, CD-ROM databases multimedia and scanners available, Internet facility, user training etc are provided

The brochure of the library is a useful ready reckoner. It explains regarding the library rules membership, number of books permitted, loss of borrowers card and books, overdue charges, special services. The OPAC brochure is a very useful guide for any use to learn how to use the OPAC, Internet and access the data base of the library. Apart from these instruction guides are placed near all OPAC terminals so that the fresher can refer them in case of any doubts while using the system. (Moorthy and Reddy, 2001)

DEVELOPMENT IN USERS EDUCATION.

In the developing countries user awareness becomes on essential component. The Earlham college user education programme become the most significant landmark in the history of user education. The council on Library resources and the association of college and research libraries in the USA, British Library Research and Development department and

the Center of Research in user studies in the U.K. promoted user education programme in their respective countries.

The need for User Education is being increasingly realized in India and practiced only since last two decades more effectively. The UGC having realised the importance of User Education in the libraries and information centers, in encouraging and conducting seminars, workshops on the importance of User Education. In India, INSDOC, DRTC, IASLIC, ILA and NISSAT have focused the User Education by organising many seminars and workshops.

NISSAT initiated introducing the computers to promote the information activities in university libraries and information centers since 1980. As a result of its efforts made through organising short term computer application course. Computerization is that it facilitates the inter linking with one library to other through net works. Library networks as NICNET, INDONET, INFLIBNET, CALIBNET and I-NET. These networks can also be made use as gateways to access online information international databases.(Moorthy and Reddy,2001)

CONCLUSION

The library and information centers are facing challenges in providing information to satisfy the users. A wide variety of technology options that exists now are regularly updated. Users Education is day by day becoming an important aspect of information work on the use of information, which itself is becoming more and more complex. With the availability of sophisticated tools like, microprocessor and micro computers.

With the dramatic increase in electronic services in the last few years, we had to pack more information into these orientations, at present the orientation has decreased. Users Education is essential for effective learning. The reference librarian, who teach the orientation classes, were looking for a new way of teaching, one that would be effective without overwhelming participants with information.

The success in methods of orientation programme would depend upon the proper planning, knowledge of the psychology of the users and involvement of the library staff to develop positive attitude of the users by conducting workshops/ seminars/training programme on UEP to maximum utilisation of library resources.

The librarian should work with such units in colleges as NSS/NCC clubs to imitate in them reading interest habits, involvement and dedication is very important on the part of library professional and libraries should enroll themselves member of state and National professional bodies to keep themselves of the latest development under the INFLIBNET. This

is a must and every library and information centers should follow the same.

The best stage for orientation is right at from the school stage enlight the students how to use the library resources and information services and how to search the information effectively.

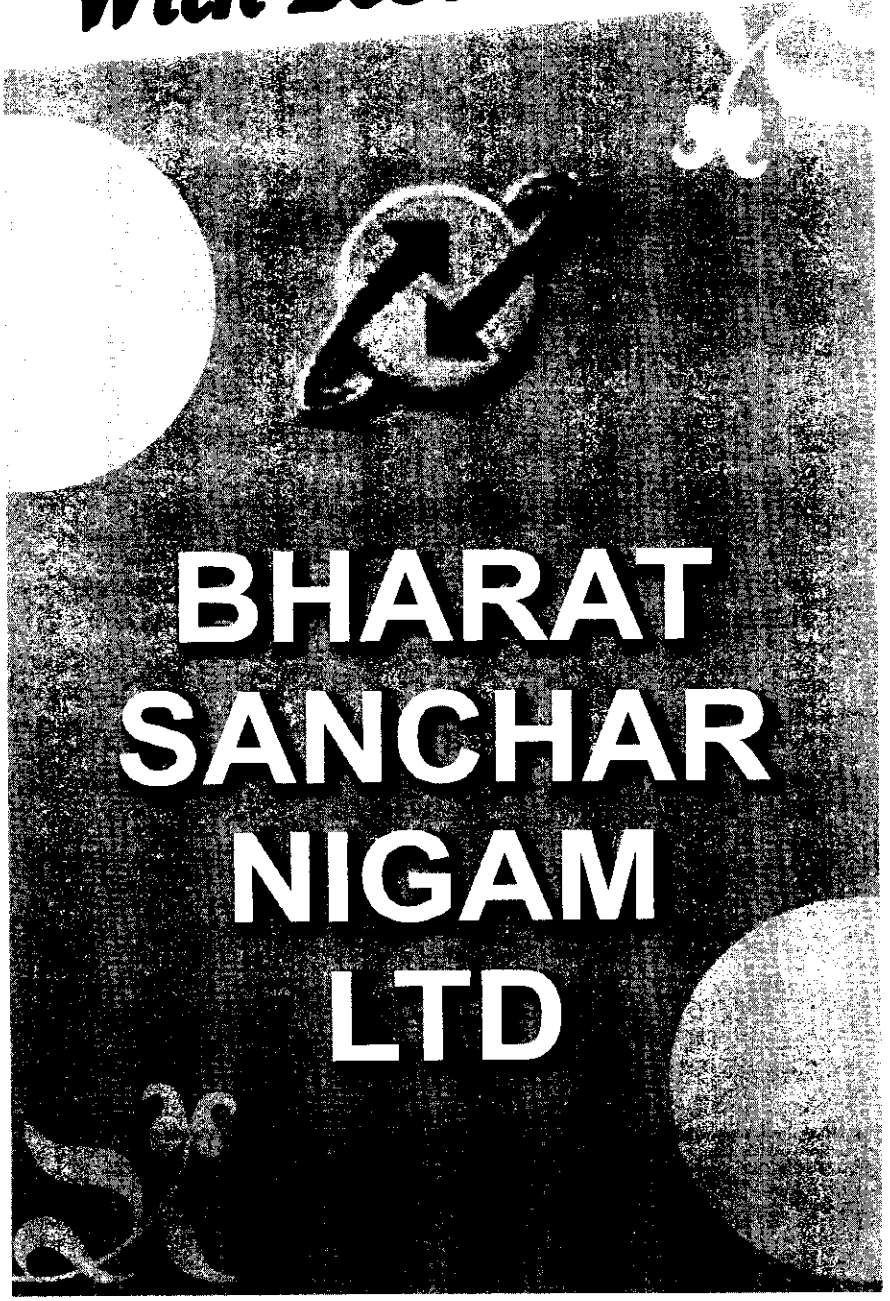
The development of Research activities, usage of Resources of the information centers will be fruitful only when proper orientation programmes are conducted to make aware the user community.

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Technical Session IV
Sub Themes
Content Creation and Content Management Systems
Information Use and Information Seeking Behaviour

With Best Wishes



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Reference and Information Services in Digital Environment

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ABSTRACT

There has been seen a proliferation in the types of information resources in digital environment which has not only changed the way of selecting, acquiring and consolidating of them but also the way of retrieving needed information by the users at the their convenience in access-friendly environment. Librarians therefore have to choose many resources and provide reference and information services to its users cleverly. This paper discusses some of the changing concept of reference and information services and their management in digital environment.

Key words : Digital Libraries, Virtual Libraries, Reference Services, Information Services, Real-time Reference.

INTRODUCTION

The information and communication technology changes have been affecting almost every type of library including public, school, academic and special libraries (Dhiman, 2003a; Dhiman and Rani, 2005 & 2007). With the advancement in information and communication technology, the walls of library are pulling down and a *Digital Libraries Virtual Libraries* in Cyber Space came into being. These libraries have brought in its wake in new flavours. The traditional information access is expanding, particularly in the design and development of new information products and services and of tools to support information seeking and selection, the analysis and synthesis of information content on behalf of users, and information user instructions. The dissemination of information was limited to the delivery of formal print publications prior to the Internet. In contrast, nowadays a person is able to create a Web page or send an e-mail message for disseminating information. World wide web or the Web in the existing real world is the age-old dreams of a universal information database - information that is not only

be accessible to people around the world, but also information that would link to other pieces of information so that only the most useful information would be quickly found by a user.

Reference Service is the phase of library work which is directly concerned with assistance to readers in securing information and in using resources of the library in study and research. To Ranganathan, "it is a personal service to each reader in helping him to find the documents answering his interest at the moment pin-pointedly, exhaustively and expeditiously". The message conveyed is that reference service means 'process of establishing contact between a reader and his documents in a personal way'. It is seen that the trends of providing reference and information services in digital library environment are also changing with the pace of time.

2. What are Digital Libraries?

Digital libraries are the organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities. Gladney et. al. (1994) has defined a digital library as "an assemblage of digital computing, storage, and communications machinery together with the software needed to reproduce, emulate, and extend the services provided by conventional libraries based on paper and other material means of collecting, storing, cataloguing, finding, and disseminating information." To Miller (2002), "a digital library is based on the two components: (i) The commercially produced databases, electronic journals, and books and other electronic resources that are routinely purchased or licensed by a library for delivery via the library's interface to users both inside the libraries and remotely and for which library's funds are expended for their purchase or license; and (ii) Those digital materials that are produced within the library or university and subsequently made available to users electronically."

Marchionini and Fox (1999) argue that digital libraries are the extensions and augmentations of physical libraries. They suggested that with respect to this broader notion of place both physical and digital libraries are instantiations in different media of the same base type - the library. In either case, both physical and digital libraries occupy the physical-conceptual continuum with respect to ideas, materials, and people. The distinction between physical and digital libraries is thus not always a clear one. But the physical libraries are considered to maintain a collection of exclusively physical materials, while digital libraries are considered to maintain a collection of exclusively electronic materials.

Whatever the case may be, a digital library has given traditional library a reform that will increase library visits by the users providing their information in digital form at computers. Today, digital library had improved the library services like electronic journal support service, Electronic Document Delivery, Electronic Publishing, Resource Service, Inter Library Loan, Full Text Searching, Cross-searching, Specialist Abstracting and Indexing Databases etc. for learning and teaching. All the information are stored on the computer that will be connected to a personal computer through a network making this period of time as a memorable time in the history of libraries. Thus a Digital Library can :

- expedite the systematic development of the means to collect, store, and organize information and knowledge in digital form.
- convert the existing print documents into digital form with the help of information technology.
- promote the economical and efficient delivery of information to all sectors of the society.
- encourage cooperative efforts which leverage the considerable investment into research resources, computing and communications Network
- strengthen communication and collaboration between and among the research, business, government, and educational communities.

ELEMENTS OF REFERENCE SERVICES

Reference or Information librarians are to assist the users in finding, selecting and using various information sources and materials. The information environment in which Information Services operates is rapidly changing as libraries embrace the digital revolution, learning becomes more interactive and information technology is increasingly integral to education and research. Students and staff are more digitally savvy, expecting instant and easy access to resources and services. They rely on a variety of electronic sources to provide relevant and accurate information to their users. Internet is becoming more and more popular source among reference librarians and users. It enables them to search, retrieve, request, receive, and download information from sources scattered all over the world on the web. The proliferation of information resources, particularly in digital media, has created a challenge for librarians in selecting, acquiring, consolidating and retrieving needed information by the users at the their convenience and in access-friendly environment. Sharma et al (2004) has stated the following three basic elements for a reference service:

- Information or knowledge base,

- User or client-now likely to be a member of the new cyber-community in which the library operates, and
- Information professional or librarian, who plays the role of intermediary in assisting and advising the user in their information seeking.

Out of these three basic elements of reference service, the first is the information or knowledge base. An essential part of the original reference paradigm was the taxonomy of reference sources - encyclopedias, dictionaries, directories, yearbooks, bibliographies, indexes, etc., that was integral to the early textbooks, and guides to reference sources. Reference material/sources of information which are used for answering enquiries in a library witnessed a complete change in their structure. Over the years the structure of knowledge or the information source tools and the way of accessing it, is greatly influenced by the technological advancements in the field of information and communication. The traditional work of reference librarians has been greatly impacted by access to electronic publications on the World Wide Web. Now Reference librarians are also using the Web to create electronic publications for in-library users and Web surfers. By creating HTML documents that provide access to Web and other electronic resources, reference service is extended beyond the physical library and designated reference desk hours, opening the building for 24-hour access. A complete new range of tools, techniques and information products is available in electronic and digital form to work.

But the most important element of the reference service is the users. Essence of the Five Laws of Library Science is that user and his information need is the prime factor in designing a reference service. Reference service and information service should be user centred. It means the emphasis is not on the book, the reference tool or the format of the information sought, but on the users, their needs, the service that can be offered to meet these needs, and the education of the user in the structures of knowledge, and ways of accessing and evaluating it. Here electronic resource prove their importance and utility in digital environment.

PROVIDING DIGITAL REFERENCE SERVICES : SOME WAYS

Reference or Information Services consists of library, information technology and e-learning professionals with specialist areas of expertise that, in a knowledge environment, increasingly intersect and overlap with each other. Reference services and information services are integral to traditional services. Although digital library and research development so far has not concentrated on them, reference services should form an

integral part of digital libraries. A number of free and fee based Reference services and information services are now available through web and many of them are offered by non-library organizations but libraries seem the best place for providing reference and information services in refined ways to its users.

Today, the terms "*virtual reference*," "*digital reference*," "*e-reference*," "*Internet information services*," "*live reference*" and "*real-time reference*" are the buzz words and they are used interchangeably to describe reference services that utilize information and computer technology in some way. Whether it is e-mail reference, chat reference or an automated routing system, virtual reference is significantly influencing the delivery of high-quality library services. Virtual Reference Service or Digital Reference Services are simply defined as the provision of real-time personal assistance to users via web-based interactive software. The librarian can "chat" as a component of the software to answer a fairly specific or simple question, or deliver digital materials, or suggest relevant web resources to the user, and provide online bibliographic instruction to satisfy the information need. This service may happen when the library is closed, or when the user is unable to get to the library. This way, users can still be in contact with experienced reference librarians.

Ultimate the purpose of digital library services is to enable the user to access the information required for knowledge enhancement. Digital library services include information about all the services, collections, digital resources, library instruction sessions and services. The specific services of digital library include - providing remote access library resources-both printed and non-printed, service deliveries and generation information on library. Depending upon the bylaws or regulations of the individual organizations, the access could be limited to members, or limited to certain resources like commercial database, where only members can access them through password. Digital Library Services provides a wide array of services to assist members of the library with organizing collections of materials or making them more widely available. Generally in a digital library, the services are expected to be provided may include:-Catalogue Databases, Current Awareness Bulletins, Externally Purchased Databases, CD-ROM Databases, Remote Information Services, Internally Published Newsletters, Reports & Journals, Internet Information Sources Mirroring & Cataloguing, E-mail, Bulletin Board Service, Netnews system, Audio and Video Communication, Electronic Table of Contents, Electronic Document Delivery Service, Electronic Theses and Dissertations, Reference Service, Electronic Publishing, and Discussion groups and forums etc. There are many other types of current awareness services but Harrison

(2004) has suggested three types of current awareness services for the journal literature. These are: Table of Contents (TOC) Alerts, Saved Keyword Search Alerts and Cited Reference Alerts.

Vijaykumar and Vijaykumar (2005) have described majority of them in following ways of providing reference and information services in digital environment:

E-mail : User sends the library an e-mail with a reference query, supplying whatever information he or she feels, is necessary. The library may reply by e-mail, phone, fax, letter, etc. Now days the Web Pages of Libraries are coming with "Ask a Librarian" option, which can also be used for getting reference services.

Web Forms : Here usually the user fills out an online form which are available on the library's web site. The form asks the user to answer clarifying questions that will help the reference librarian responding to the query. The user sends the completed form to the library and the library may reply by e-mail, phone, fax, letter, etc. While e-mail reference allows the user to write down the query in his or her own words, a web form structures the user's request somewhat, prodding the user to supply additional information that will specify the request.

Chat Reference : Here, user exchanges short, text messages back and forth with the librarian, in a chatting environment. This way does not allow for all the fancy interactivity that web contact center software allows, but it does allow for rapid, basic communication. There are three ways of running this kind of a service – with free, instant messaging software (such as AOL Instant Messenger), with a web based chat room, or with chat software purchased by the library. With most of these services, the user types in an opening query or greeting to get the attention of the librarian staffing the chat reference service. The user and librarian may exchange a series of short messages to get to the heart of the user's request.

Chat reference can also be used with web based contact software. For this borrowing technology from online customer service, software for web contact centers not only allow for instant messaging, but they also offer to give the librarian power to control the user's browser. A librarian can actually make the user's browser display a recommended web page, such as a search engine or the main page for the library's online catalogue. As the librarian pushes pages onto the user's browser, the chat window can also appear on both user and librarian's screen, allowing them to have a typed conversation about the web pages being sent to the user.

Collaborative Networks for Reference : Here, two or more libraries team up to offer reference service using any of the above online formats. The user would send to a member library his or her request, which would be forwarded to the library best able to answer the question. A library may get a question routed to it because it has particular strengths in its collection that match the needs of the user. Or a member library might get a question routed to it because it happens to be open when the user makes his or her request.

Knowledge-bases : Knowledge bases are used to retain questions and answers for reuse, in searchable database or archive. The use of previous answers to respond to new questions, knowledge bases reduce question response time and duplicated effort. If users search for and find prospective answers to their questions, knowledge bases allow libraries to meet users at their point of need. Knowledge base records will have high quality of information that users may not find on the Web. An effective knowledge base amounts to a peer-reviewed institutional memory, if only we add authoritative and reliable questions and answers to it. This is a typical way of the traditional reference service to keep all the reference questions and answers in files, through which the a "long range reference" becomes a "ready reference".

In addition, Harris cited in Gail (1991) has pointed out the following general types of current awareness services:

- Alerts for the table of contents of journals or news articles on a topic.
- E-Newsletters and Weblogs. E-Newsletters might be an article from a specialist, a news digest, or an alert to content at a website. Weblogs may offer an alternative view or a running diary.
- RSS Feeds from web sites, usually news. It uses a web newsreader.
- Current news filtered by topic. Users select from topics predefined by the service and may also create their own topics. There is a huge range in level of sophistication, style of delivery, number of sources used, and price.
- News syndicators stream news to an Intranet or corporate portal. Topics may be selected and/or construct special trackers.
- Notifiers or web page monitors report on changes at a web page.

Weblogs or the blogs are the sites that capture particular views, ideas, or opinions overtime. These are the web applications, which contain periodic posts on a common web page. In a blog, the entries are read, commented on, and discussed by an even larger community, often

fostering active debate. This may sound similar to a listserv and, in some ways, it is. However, unlike a listserv, blogs are typically accessible to the public at large, thereby encouraging more diverse readership and disseminating information further and with greater speed. The hypertextual, link-centric nature of weblog entries further facilitates this rapid exchange and distribution of information. Blogs are perfect for dissemination of information as the system of dated entries makes it easy for viewers to identify new content (Dhiman and Sharma, 2008). Blogs are a simple and efficient way for librarians to stay informed and for libraries to disseminate information in a timely manner.

CONCLUSION

Thus, it is seen that the role of librarians is continuing to evolve with the adoption of digital resources, especially the Internet and World Wide Web into the profession of librarianship (Dhiman 2003b). Though it is difficult to predict with certainty how active the role of librarians would be in this evolving scenario, it can be said with confidence that their services cannot be dispensed with because they have the necessary qualification and historically the first right to attend to the information needs of the seekers.

Though the costs, technologies, legal issues and administration of *Digital Libraries* militate against achieving paradigm vision, there is no doubt that present and future developments of digital reference in different forms is crucial in order to cater the different types of information seeking behavior requirements of the users, but at the same time it is equally important and productive to develop our own innovative products based on sound theoretical principles which can handle the user needs more efficiently and effectively. Further, the information professionals are required to cope up with the new technological changes, but at the same time one should not fear that the new emerging technology based services will replace the traditional services completely rather these are emerging as supplementary services to improve the information dissemination amongst the user community.

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Content Management System: The Future of Web Services

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ABSTRACT

CMS provide the way for revolutionary changes in library and information centers, the libraries have a great deal of content to present on their websites, their catalogue, online database, information about the library, rules and regulation, links to the resources that the library offers and digital repositories can easily contain hundreds of thousand of bibliographic records, electronic articles, images and other files. Through this way LIS professional can shifting the traditional library to e-platform and provide the dynamic, useful and organized whole library information for our users.

KEYWORDS: Content, Content Management System, Information, and Library services.

INTRODUCTION

Today everyone living in the age of information it's a dynamic resource and support to education, research and development, but every one require all information in the right from at the right time. In today's content management is going to play a crucial role for any one, any time and anywhere. CMS's important for delivering right information to the

right people at the right time. We are heard the buzz about the time, money and resource a CMS can save us. It's true that a CMS can save money, time and resources, but these benefits don't have to cost you a penny (Carter 2005).

Presently Internet moves from presentation medium to dynamic content provider, content issues are moving to the thinking of users. It involves ensuring that users can able to access all the information of possible relevance to them, because it is not valuable until it is accessed and utilized properly.

CMS provide the way for revolutionary changes in library and information centers, the libraries have a great deal of content to present on their websites, their catalogue, online database, information about the library, rules and regulation, links to the resources that the library offers and digital repositories can easily contain hundreds of thousand of bibliographic records, electronic articles, images and other files. Through this way LIS professional can shifting the traditional library to e-platform and provide the dynamic, useful and organized whole library information for our users.

CONTENT, CONTENT MANAGEMENT & CONTENT MANAGEMENT SYSTEM

Content

Content is the information put to use. Content is not a single piece of information, but a conglomeration of piece of information put together to from a cohesive whole. Content is made up of stuffs, items, elements, and thus have to meaning without well understanding context (Baika). Content is closely related to medium that transfer it gives exact location on which the chapter or articles or information begins is also indicated against each item at the beginning of the document.

Content Management

Many people see the content management as a way to create website only, but content management is a much broader process of collecting managing and publishing information to whatever medium you need. Content management provides a method for managing (library) resources, information, type of materials and ensuring that information can be easily retrieve for reuse.

Content management address the process of creating collection, storing and sharing of organizational content generated within the organizational as well as outsourced. It involves ensuring that users, customer, employee etc. are able to access all the information of possible relevance to them. Content management in a nutshell is effectively collecting,

managing and making information available in targeted publication (Kamalavijayan 2005).

Content management is information plus metadata management is a process of control Taken together, content management is the process of controlling your information through the application and use of metadata.

Content Management System:

Internet, webpage provide the opportunity of varied style of presentation of information as compared to traditional from of document and content management system (CMS) is process of sharing information vital to an organization. Internet and CMS involves sharing information using the private computer networks and intranet (or extranets) as a primary communication tool.

CMS are tools for creating, organizing and sharing information through internet among customer, employees, partners and other constituents. In other words digitized text, Images, sound and increasing integrated Multimedia packages held in personal, local regional, national or international database, together with index, catalogues and description to enable the content to be located. It is provide help to find the information in a need based manner and tailor made fashion from most resources. It is system used to manage the content of a webpage and website. Simply define a CMS is comprise of a database, server pages such as active server pages (ASP), personal home page (PHP), internet information server (IIS), personal web server (PWS) and an editing tool of manage web content.

I fact, a CMS should ideally enable greater levels of customization, when necessary, and uniformity, also as necessary. The ease of pursuing out digital material or objects (content) by non-technical staff, facilitating decision regarding site architecture and distribution of authorship and editorial roles (management), and providing the mechanisms to carry this out (system) – are all roles critical to the success of a CMS as a technology that enables an organization to met the needs of its users. This view of CMSs as not primarily a technology, but rather as a process framework has been applied specifically to the library environment and its content management realm (Browning and Lowndes, 2001).

WHY CONTENT MANAGEMENT SYSTEM?

Content management is one of the most important tools for e-platform. It has tremendous use in day-to-day life. These are following points describing why content management system is requires?

- It is essential for presenting qualitative and nascent information to the users.

- It allows efficient use of information generated inside the organization as well as outsourced.
- Require to manage a web-based file which facilitates the users to browse, edit, retrieve and downloading the required information from the ocean of digitized knowledge.
- CMS are necessary for cost saving, better economics of scale and ensure quality and compliance.
- CMS require grow business and handle large or even small scale project.
- It is very essential for presenting qualitative and exact information to users.
- It's essential for automation and to get the quality for clients require at the other hand.

CMS also provide the ability to:

- Control Information
- Link to Electronic network
- Link to physical manufacturing and Delivery system
- Search and locate content on network
- Retrieve information form network
- Display information
- Reuse information

TYPES OF CONTENT

The types of content are

- Graphics
- Text
- Multimedia
- Database
- File downloads

CATEGORIES OF CONTENT MANAGEMENT SYSTEM

There are six main categories of CMS, with their respective domains of use:

- Enterprise CMS (ECMS)
- Web CMS (WCMS)
- Document Management System (DMS)
- Mobile Content Management System
- Component content management system
- Media Content Management System

IMPORTANT PARTS OF A CONTENT MANAGEMENT SYSTEM

Content Management is the collection, management, and publication of content. A content management system starts with a purpose and a set of target publications. From these, a set content component is derived that serve the stated purpose, and can be combined to create any of the target publication. Its allow them to be created, managed, and drawn into publications by a staff whose action are guided by a set of codified procedure called workflows. To make the content available, the system creates publications such as web site, printed document, and email newsletters. A content management system is needed when there is too information to collect, manage and published by hand.

The collection system is the tools and procedure to collect content inside the CMS. Content collection can be broken into these categories:

- Authoring
- Aggregating
- Converting
- Editorial

The Management system is the database\repository of all content and meta information, as well as the process and tools to access, updated and collect meta information. The database\repository holds all of the content and meta information of the system. It is perform the following function:

- Store Content
    - Textual content
    - Components
    - Binaries and file-based data
    - Meta information
- Select content
- Manage content
    - Security
    - User maintenance
    - Content tracking
    - Transaction logging
    - Bulk automated process
    - Input/output process
- Connect to other systems

The Workflow system is the tolls, procedure to assure that the entire process of collection, storage, and publication runs effectively and efficiently according to well-defined timeline and actions. The workflow system sets and chain of events around collecting, reposting, and publishing. To be successful, the workflow systems should:

- Extend over the entire process
- Represent
    - Staff members
    - Standard process
    - Standard tolls ad their functions
    - Time and data flow
- Visual interface
- Make meta information in the repository available

The Publishing system is the tools, procedure to draw content out of the repository and create publications, in other words the process by which content is drawn out of repository and formatted into web sites and other publications, the publishing system must include:

- Publication templates
    - Target publication
    - Formatting syntax
    - Page structure and syntax
    - Content components and meta information
    - Standard text and binary files
- A full programming language
- Runtime dependency resolution
- File and directory creation

ADVANTAGE OF CONTENT MANAGEMENT SYSTEM

Content management system is a necessary for maintaining an organizational website, it is also important to ensure however, that beyond a general need, CMS should be made to meet specific goal. Following are some of the advantage of CMS:

Advantage of CMS:

- CMSs are well written software and tested by a large community of users.
- To quality of the information on website and intranet.
- Duplicate of information across the unit and platform increase maintenance costs and error rates. Wherever possible, information should be stored once, and reused multiple times.
- The CMS should enhance the ability to provide a full-featured, rich environment for website visitors.
- CMS include enhancement to the quality of the site, and downloading of the required information from a website is very ease.

- CMS streamlined to support rapid and simple updates to information across the site.
- Through CMS increase the amount of information published on websites. The CMS deliver efficiency and management benefits to support the goal of website growth.
- Effective searching can be possible to retrieve particular information.
- The CMS improve capacity of website. Large volume of data can be stored and accessible to the users as well as providing greater transparency and accountability.
- Direct staff communication, and 'peer-to-peer' sharing of information are two of the most effective ways of spreading knowledge. The CMS provide both an environment and the tools to facilitate these processes.
- The CMS allow find and track the key information.
- Cataloging, editing, referring, indexing and information transfer can be done with ease and speed.
- Effective and powerful searching can be possible to retrieve particular information.
- Reduce website publishing and maintenance cost, presently most of the CMSs are available free of cost.
- The CMS allow a wide audience to access the website.
- Mostly CMS are easy to install.

CONCLUSION

Content management system ought to accomplish simple tasks simply, and complex tasks as simply as possible. An effective CMS ought to manage site architecture, relationship between pages, provide role-based authorizations, and offer reasonable authoring, editorial, and publishing process that fit the library's model. A simple CMS can be used anywhere by anyone even in conjunction with an enterprise CMS. The beauty is in its simplicity. CMS program and library system that facilitate access to digital resource actually contribute in substantial ways to the important of education and the efficiency of professionals. Through this we can provide effective search of library catalogue, database, and access to the print and electronic offering of the campus library users, online help, virtual integration and total information sharing among all of an libraries, organizations, users and employees. Content management system positively effective to the process of information sharing becomes valuable only when the right data is communicated to the right people at right time easy and fast.

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Content Management System

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ABSTRACT

Two factors must be considered before an organization decides to invest in a CMS. First, an organization's size and geographic dispersion must be considered especially if an organization is spread out over several countries. For these organizations, the transition to CMS is more difficult. Secondly, the diversity of the electronic data forms used within an organization must be considered. If an organization uses text documents, graphics, video, audio, and diagrams to convey information, the content will be more difficult to manage.

INTRODUCTION

A content management system (CMS) is a system used to manage the content of a Web site. Typically, a CMS consists of two elements: the content management application (CMA) and the content delivery application (CDA). The CMA element allows the content manager or author, who may not know Hypertext Markup Language (HTML), to manage the creation, modification, and removal of content from a Web site without needing the expertise of a Webmaster. The CDA element uses and compiles that information to update the Web site. The features of a CMS system vary, but most include Web-based publishing, format management, revision control, and indexing, search, and retrieval.

The Web-based publishing feature allows individuals to use a template or a set of templates approved by the organization, as well as wizards and other tools to create or modify Web content. The format management

feature allows documents including legacy electronic documents and scanned paper documents to be formatted into HTML or Portable Document Format (PDF) for the Web site. The revision control feature allows content to be updated to a newer version or restored to a previous version. Revision control also tracks any changes made to files by individuals. An additional feature is indexing, search, and retrieval. A CMS system indexes all data within an organization. Individuals can then search for data using keywords, which the CMS system retrieves.

DEFINITION

A **Content Management System (CMS)** is a collection of procedures used to manage work flow in a collaborative environment. These procedures can be manual or computer-based. The procedures are designed to:

- *Allow for large number of people to contribute to and share stored data*
- Control access to data, based on user roles. User roles are used to define each use as to what information they can view or edit
- Aid in easy storage and retrieval of data
- Reduce repetitive duplicate input
- Improve the ease of report writing
- Improve communication between users

TYPES OF CMS

There are six main categories of CMS, with their respective domains of use:

1. Enterprise CMS (ECMS)
2. Web CMS (WCMS)
3. Cocument Management System (DMS)
4. Mobile Content Management System (MCMS)
5. Component Content Management System (CCMS)
6. Media Content Management System(MCMS)

ENETRPRISE CONTENT MANAGEMENT SYSTEM

Enterprise Content Management (ECM) refers to the technologies, strategies, methods and tools used to capture, manage, store, preserve, and deliver content and documents related to an organization and its processes. ECM tools allow the management of an enterprise level organization's information.

In late 2005 **AIIM** defined ECM as follows:
Enterprise Content Management is the technologies used to Capture, Manage, Store, Preserve, and Deliver content and documents related to organizational processes.

In early 2006 **AIIM** added the following paragraph to the definition:

ECM tools and strategies allow the management of an organization's unstructured information, wherever that information exists.

In early 2008 **AIIM** changed the original definition to:

Enterprise Content Management (ECM) is the strategies, methods and tools used to capture, manage, store, preserve, and deliver content and documents related to organizational processes. ECM tools and strategies allow the management of an organization's unstructured information, wherever that information exists.

COMPONENTS OF AN ECMS

Enterprise content management systems combine a wide variety of technologies and components, some of which can also be used as stand-alone systems without being incorporated into an enterprise-wide system. The five ECM components and technologies of the ECM model were first defined by AIIM as follows:

- capture
- manage
- store
- preserve
- deliver

LIBRARY SERVICES

Library services have to do with libraries only in a metaphorical way. They are the administrative components close to the system that handle access to information. The library service is responsible for taking in and storing information from the "capture" and "manage" components. It also manages the storage locations in dynamic storage, the actual "store," and in the long-term "preserve" archive. The storage location is determined only by the characteristics and classification of the information. The library service works in concert with the database of the "manage" components. This serves the necessary functions of search and retrieval.

While the database does not "know" the physical location of a stored object, the library service manages:

- online storage (direct access to data and documents);
- nearline storage (data and documents on a medium that the drive can access, but for which robotics or something similar must first be set up), and
- offline storage (data and documents on a medium that is removed from system access).

STORAGE TECHNOLOGIES

A wide variety of technologies can be used to store information, depending on the application and system environment:

read and write magnetic online media;
this includes hard drives as RAID (redundant array of independent disks) server drive subsystems, storage area networks (SANs) as storage infrastructures and network-attached storage (NAS) as directly accessible network storage areas;

magnetic tape
in automated storage units like "libraries" or "silos" with robotics for access, used like DAT in smaller environments for backup but not online access;

digital optical media
CD (CD-R for write-once, read-only Compact Disc, CD/RW for read-and-write compact disk), digital versatile disk (DVD)), MO (magneto optical), and other formats can be used for storage and distribution, or in jukeboxes for online storage.

Cloud Computing
storage of data on external servers off-site where they can be accessed via the internet.

LONG TERM STORAGE MEDIA

WORM optical disc
Write Once Read Many (WORM) rotating digital optical storage media, which include the classic 5 ¼" in or 3 ½" WORM disc in protective sleeve, as well as CD-R and DVD-R. Recording methods vary for these media, which are held in jukeboxes for online and automated nearline access.

WORM tape

Magnetic tapes with WORM characteristics are used in special drives, that can be as secure as a traditional WORM medium if used properly with specially secured tapes.

WORM hard disk drive
Magnetic disk storage with special software protection against overwriting, erasure, and editing, delivers similar security like a traditional WORM medium. An example is CAS (content addressed storage).

Microfilm
Microforms like microfilm, aperture cards, jackets a.s.o. can be used to back up information that is no longer in use and does not require machine processing.

Paper
Paper still has applications as a long-term storage medium, since it does not require migration, and can be read without any technical aids. However, like microfilm it is used only to double secure originally electronic information.

LONG TERM PRESERVATION STRATEGIES

To secure the long term availability of information different strategies are used for electronic archives.

migration
continuous migration of applications, index data, meta data and objects from older systems to new ones generates a lot of work but secures the accessibility and usability of information, and allows during this process the deletion of information which is no longer relevant; conversion technologies are used to update the formats of the stored information;

emulation
emulation of older software allows us to run and access the original data and objects; as well as special viewer software which can identify the formats of the preserved objects and can display the objects in the new software environment.

Standards for interfaces, meta data, data structures and object formats are important to secure the availability of information.

TRANSFORMATION TECHNOLOGIES

Transformations should always be controlled and trackable. This is done by background services which the end user generally does not see. Among the transformation technologies are:

COLD / ERM (Computer Output to Laser Disc)
As distinct from "Capture" components, it prepares output data for distribution and transfer to the archive. Typical applications are lists and

formatted output, for example individualized customer letters. These technologies also include journals and logs generated by the ECM components. Unlike most imaging media COLD records are indexed not in a database table but by absolute positions within the document itself (i.e. page 1 line 82, position 12). As a result COLD index fields are uneditable after submission unless they are converted into a standard database.

personalization
this is no longer just a function of web-based portals, but applies to all ECM components; persionalization gives the user just those functions and information that he needs;

XML (Extensible Markup Language)
a description language that allows description of interfaces, structures, metadata, and documents; XML is becoming the universal technology for describing information;

PDF (Portable Document Format)
an intelligent print and distribution format that enables the platform-independent presentation of information: unlike pure image formats like TIFFs, PDFs permit content searches, the addition of metadata, and the embedding of electronic signatures;

XPS (XML Paper Specification)
a XML specification developed by Microsoft describing the formats and rules for distributing, archiving, rendering, and processing XPS documents;

converters and viewers
serve to reformat information to generate uniform formats, and also to display and output information from different formats;

compression
used to reduce the storage space needed for pictorial information; the ITU process (CCITT) is mainly used for b/w for TIFFs, and JPEG2000 for color images; ZIP applications allow the compression of any kind of data for transfer; Document Storage Reduction discusses other techniques to reduce the amount of storage for both pictorial and non-pictorial information, and

syndication
used for presenting content in different formats, selections and forms in the context of content management; syndication allows the same content to be used multiple times in different forms for different purposes.

DISTRIBUTION

All of the above technologies basically serve to provide the various contents of an ECM to target users by various routes, in a controlled and user-oriented manner. These can be active components such as e-mail, data media, memos, and passive publication on websites and portals where users can get the information themselves. Possible output and distribution media are:

- Internet, extranet and intranet;
- E-business portals;
- employee portals;
- E-mail and fax;
- data transfer by EDL, XML or other formats;
- mobile devices like mobile phones, PDAs and others;
- data media like CDs and DVDs;
- digital TV and other multimedia services, and
- paper.

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Creation of Data Base From Library Software: An Evaluative Study of Libraries of Indian Council of Social Science Research Institute's

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ABSTRACT

Database is a collection of record or a file accessible by a given set of programs. ICSSR's institutes libraries have a good database such as books, journals, back volumes of periodicals, research journals, monographs, thesis, dissertation, project report, CDs, database, microfilm, videocassette and commercial database like POPLINE, Social science citation Index, Social science index, sociofile, UNESCO database, NUCSSI, psycLIT, ERIC, EconLit, Dissertation, Abstract of Humanities And Social Science, AGRICOLA, CAB etc.

In ICSSR's 73 percent of the libraries have bibliographic database, 68 percent libraries have books and document database and 50 percent libraries have services database, 45 percent have indexing, 32 percent have circulation, journals and periodical databases, 27 percent have a library member database etc. 59 percent of the surveyed respondents have made their opinion that commercial database is available in their libraries. However 23 percent of the respondent stated that they have in-house database.

INTRODUCTION

Electronic database is a collection of electronic record, electronic publication or file accessible by a given set of programs through the computer and online search, it provides the online search also it means without database online search is not possible. Internet provide wide range of on-line electronic–database with comprehensive, less time and lest cost with on your fingertips. Mostly popular electronic–database are

available on Internet can be search at any time, at any where in the worldwide.

Electronic bibliographic database: Electronic bibliographic database is an application of computational techniques to the management and analysis of bibliographic information and collection and systematic arrangement of bibliographic descriptive information about document, books and periodicals.

The CD-ROM database and some online database are available on Internet for searching social science and related information in libraries. Libraries also provided free services to its members to downloading and printings of data base abstracts from CD-ROM and on-line social science database.

Objective: The main objectives of the study are as follows:

1. To find out the status of the different type of database are available in the libraries.
2. To find out the status of different type of commercial and in-house database available in the libraries.
3. To know the different type of e-publication are available in the libraries.
4. To find out accessibility of database.

1 Data Base: Electronic database is a collection of record or file accessible by a given set of programs.

1.1 Types of Data Base: The databases are divided in to two types.

- **Indicative Data base:** indexing database, abstracting database, bibliographic database, cataloguing database.
- **Informative Database:** Full text database, subject database

1.2 Arrangement of Database: The mostly database are arrange according to Alphabetical arrangement, classified arrangement, subject wise arrangement, key word

1.3 Search System: Online search, off line search

1.4 Updating of Database: Daily, Weekly, Monthly, Quarterly, Yearly.

QUALITY OF ELECTRONIC DATABASE

Database provides the easy and fast access of information and some others facilities i.e. easy to use, easy to search, essay to upgrade, easy to retrospective search, multi user access, multitasking, ubiquity, user friendly, remote login search facilities, web search facilities, preservation on optical disk, wide range of reading material, link with the other sources, provides the contents search facilities, provides the subject wise search facilities, link with other commercial database, provides facilities to discussed with the author and editor through the email link, provides

pinpointed information, follow the basic principles of library science and documentation services, with out database online search is not possible, access nascent micro thought, space conservation, time saving, data base can shear freely at any time, carry large number of data, data base downloadable facilities, content search through the net, web access, print on demand, protecting from the computer virus, global search, quick up date provides the up date version free of cost or less cost, provide the archival search facilities, easy and fast delivery of data base.

INTERNET DATABASE

Most of the libraries are provides Internet services to their members in the form of text and graphic mode, most popular facilities are e-mail, chat and subject wise information which available on different websites and online databases. The broad categories of resources on Internet are yellow pages, on line dictionaries, digital encyclopedias, manuals and handbooks, digital maps, on-line travel guides, standards, on-line glossaries, bibliographic sources, abstracts database, journal, database, network, electronic library, web sites.

Library in-house database:

Social science libraries have huge collection of resources such as books, Journals, back volumes of periodicals, research journals, monographs, thesis, dissertation, project report, CDs, database, microfilm, videocassette, etc, the library soft wares are managing and creating the database of all type above mention resource available, to easy access. Some most important library in-house database are given below:

- Database of books
- Database of Journals
- Database of back volumes of periodicals
- Database of Theses
- Database of Report
- Database of CDs
- Database of Database
- Database of Microfilm
- Database of videocassette
- Database of dissertation

OPAC database

- Departmental database
- Accounting database
- Bibliographic database
- Union catalogue database
- Web database
- Library Members database
- Venders database
- Administration database

- Circulation Database
- Indexing database
- Library services database
- Any other

Social Science commercial database

Social science library are generating information various types resource like bibliographical resources, electronic resource of data warehouse and data bank and CD ROM databases i.e. POPLINE, Social science citation Index, Social science index, sociofile, UNESCO database, NUCSSI, psycLIT, ERIC, EconLit, Dissertation Abstract Humanities And Social Science, AGRICOLA, CAB etc. Libraries also provide the searching of references from CD ROM databases. Some most popular publishers are published the Indexing Database, Abstracting Database, Bibliographic Database, Cataloguing Database, Full Text database, Subject database in the field of social science. Some most important database oftenly used in the Social science libraries given below: Table-1 Service Database Available in the libraries

S No.	Database	Publisher	Place	Type	Frequency
1	POPLINE	John Hopkin	USA	Bib, Abst.	2/12
2	UNESCO database	UNESCO	France	Dir, Bib	1/12
3	Agrisearch	Silver Platter	USA	Text, Dir.	1/12
4	Social science citation Index	ISI	USA	Bib.	4/12
5	Arts & Humanities citation Index	ISI	USA	Bib.	1/36
6	Social science index	H W Willson	USA	Bib.	12/12
7	CAB Abstract	CAB Inst.	England	Bib.	4/12
8	Sociofile	Sociological Abst, Inc.	USA	Bib, Abst.	3/12
9	AGRICOLA				
10	Business Index	IAC	USA	Bib.	12/12
11	PsycLIT	APA	USA	Bib.	4/12
12	Education Index	H W Willson	USA	Bib.	12/12
13	ERIC	USDE	USA	Abst.	2/12
14	Dissertation Abstract Humanities And Social Science	UMI	USA	Abst.	2/12
15	EconLit	American Eco. Asso.	USA	Bib, Abst.	4/12
16	AGRIS	UN	Rom	Bib.	4/12
17	Humanities Abstract	ABC-CLIO	USA	Bib.	3/12

18	NUCSSI	INSDOC	N. Delhi	Union cata.	1
19	Euro Subsidie	Kulwer	Netherlands	Full text	4/12
20	Global Defense Information	Teldan	Israel	Bib, Dir	12/12
21	Historical Abstract	ABC-CLIO	USA	Bib.	3/12
22	LISA Plus	Bowker	England	Bib.	4/12
23	PsycLIT	APA	USA	Bib.	4/12
24	Social Science Source	EBSCO	USA	Bib, text	12/12
25	Women's studies	Macmillan	USA	Bib.	2/12
26	Statistical Master File	CIS	USA	Bib.	4/12
27	Ulrich Plus	Bowker	USA	Bib.	4/12
28	World Trade Database	Stat. Canada	Canada	Stat.	1/12
29	Inside Social Science Humanities Plus	British lib.	England	Bib. Abst.	
30	Information Science Abstracts	IFI plenum data	USA	Bib.	4/12
31	Food & Human Nutrition	UN	Austria	Bib.	2/12
32	EMBASE	Elsevier	Netherlands	Bib.	4/12

RESEARCH METHODOLOGY

Library professional of ICSSR institute of ICSSR institute library comprises the universe of the study. A purposive sampling of non-probable sampling framework has been adopted in this study for the selection of library personnel. For a proper spatial coverage the selection of the respondents was made from all 27-research institute of ICSSR from each institute one library professional was selected for the study.

The questionnaire method was adopted for the collection at data as the study is concerned with the library automation in libraries of ICSSR. It was essential to make use of observational method to extract. Information & get in sight into the issues involved. After completion of data collection, the observations, information was systematically classified. On the basis of filled questionnaire a codebook was prepared & accordingly all the questionnaire were coded. Coded questionnaire were analyzed is terms of simple percentage.

Result and Discussion: Following findings had been come out from the study:

Table-2 Service Database Available in the libraries

Sr. No	Database	Percentage
1	Library Services	50
2	Departmental database	18
3	Bibliographic database	73
4	Indexing database	45
5	Circulation Database	32
6	Member database	27
7	Book/document database	68
8	Union catalogue database	0
9	Administration database	9
10	Accounting database	14
11	Venders database	18
12	Journals/ periodicals database	32
13	Web database	14
14	Commercial Data base	27

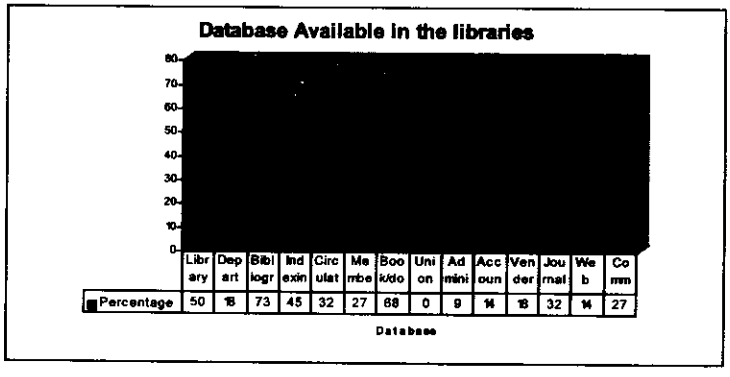


Fig-1 Service Database Available in the libraries

The table 2 discloses that status of the different database available in the libraries, some of them libraries are created in-house data base and some database are subscribed by the libraries which developed by the professional agencies and is purchased by the ICSSR libraries. 73 percent of the surveyed libraries have bibliographic database and 68 percent libraries have books and document database. At the same time 50 percent libraries have given their opinion that 50 percent libraries have libraries services database, 45 percent Indexing, 32 percent have circulation, journals and periodical databases, 27 percent members have a library member database. Commercial data base play the true database services there are 27 percent members have Commercial data base. 18, 14 and 9 percent libraries are developed the Venders database, Accounting database, and Administration database respectively.

However none of them have made responses for the Union catalogue database.

Thus it can be concluded that bibliographic database is the most commonly used in almost all the libraries of the ICSSR'S institutes. The status of books and document database is also encouraging in most of the selected libraries.

Table-3 Database Available in the libraries

Sr. No	Database	Percentage
1	Commercial	59
2	In-house	23
3	No response	18

The table 3 illustrated that 59 percent of the surveyed respondents have made their opinion that commercial database is available in their libraries, however 23 percent have in-house database.

It can concluded that use of the commercial database is high but use of in house database is not encouraging in libraries of ICSSR's institutes.

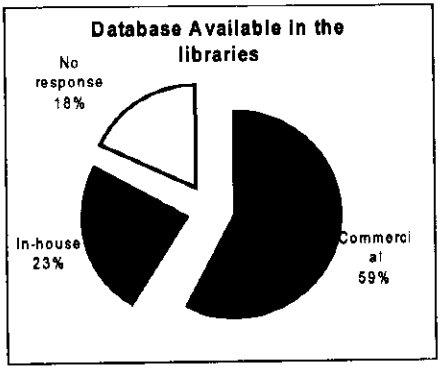


Fig-2 Database Available in the libraries

Table-4 E-Publication Available in the libraries

Sr. No	E-Publication	Percentage
1	E-Book	14
2	E-Journals	14
3	No response	72

The table-4 indicates that 14 percent of the surveyed libraries have each e-books and e-journals. It can be inferred that there is little use of the e-books and e-journals in all the selected libraries.

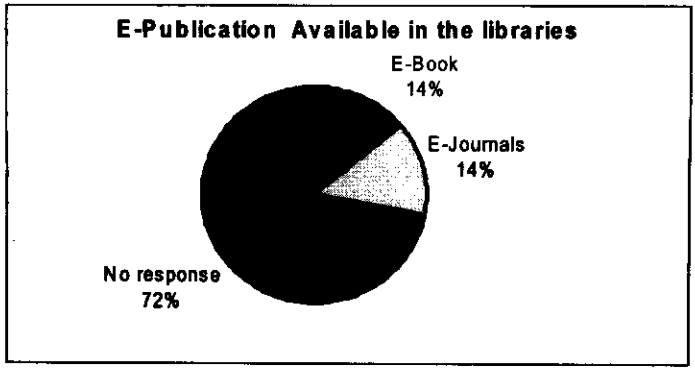


Fig-3 E-Publication Available in the libraries

Table-5 DBMS Available in the libraries

Sr. No	DBMS	Percentage
1	Acquisition	23
2	Processing	14
3	Reference	50
4	Periodical	14
5	Members Registration	50
6	Circulation	50
7	Cataloguing	50
8	OPAC	50
9	Documentation	77
10	Administration	77
11	Technical Services	5
12	Internet Access	77

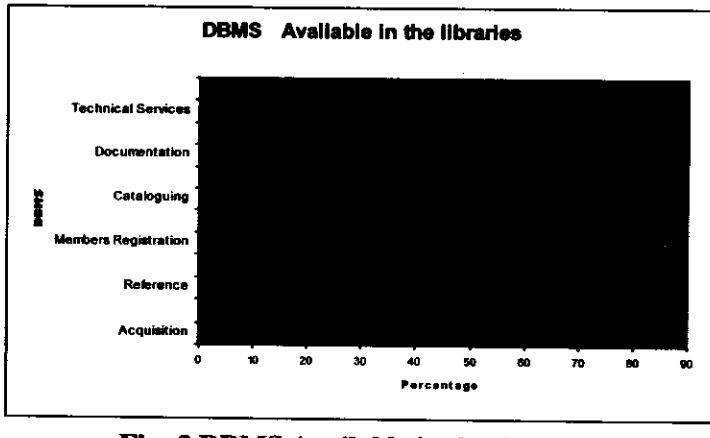


Fig.-3 DBMS Available in the libraries

The table 5 illustrated that 77 percent of the surveyed respondents mentioned that they have documentation, administration, and Internet access system for the database services in their libraries. However 50 percent of the libraries have reference, member's registration, circulation, catalogue access and OPAC system for database services. 23 percent of the libraries have acquisition modules for database services and 14 percent have processing and periodical modules. At the same time 5 percent respondents stated that they have technical services for the same. It can be inferred from the above table that database for documentation services are encouraging in all the libraries of ICSSR's institutes.

Table-6 Creation of Record for database in the libraries

Sr. No	Data base	Percentage
1	Book Selection	9
2	Cataloguing	68
3	OPAC	59
4	Indexing	55
5	Circulation	14
6	Due Date	9
7	User Profile	23
8	Document Profile	32
9	Abstracting	5
10	CAS/SDI	41
11	Budgeting	9
12	News Paper	23
13	Annual Report	14
14	Periodical Acquisition	14
15	Checking Duplication	9
16	List of new addition	27
17	Current Contents	18
18	Holding data for Missing issues of periodical	14
19	Venders Profile	9
20	No response	14

The table 6 discloses that 68 percent of the libraries have created record for cataloguing database, 59 percent for OPAC, 55 percent indexing, 41 for CAS/ SDI services database, 32 percent for Document Profile, 23 for percent for News Paper clippings, 18 percent for Current Contents list and 14 percent for Holding data for missing issues of journals & No response.

Table-7 Accessibility of Database

Sr. No	Accessibility	Percentage
1	Yes	36
2	No	64

The table 7 depicts that 36 percent of the surveyed respondents have access the database for libraries services and housekeeping jobs in daily use but 64 percent didn't access the database for the same.

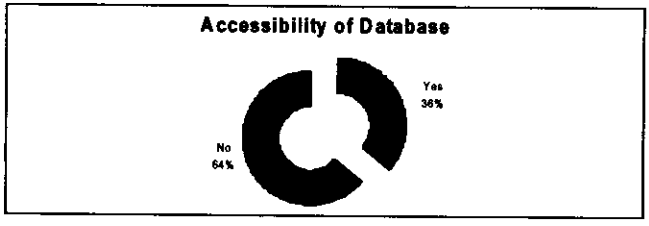


Fig.-4 Accessibility of Database

CONCLUSION

In ICSSR libraries, most of the libraries have bibliographic database and document database. Thus it can concluded from the study that use of the commercial database is high but use of in house database is not encouraging in almost all the libraries of ICSSR's institutes. There is poor response for accessibility of database due to financial crises. ICSSR has taken the action to proper planning of networking for library resource sharing & cooperation by providing the additional grant for the library automation: as per his annual report.

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Information Gathering Habits of Social Scientists in Jamia Millia Islamia, New Delhi: A Study

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ABSTRACT

It is clear from the result of the study that most of the Social Scientists (means Ph.D. Students) visit library daily, most of the Social Scientists (mean Ph.D. Students) from various departments of faculty of Social Sciences are well aware of the available resources and services. The study reveals that a good percentage of the Social Scientists are not aware of the Inter Library Loan (ILL) services and microfilm services. It is clear from the result that lending services of books and periodicals and Internet services, online access to books and journals has been rated as the most used services by the scientists followed by reference and information services and bibliographic service. Information gathering habits will take a clear shape and expression only when he is provided with the proper bibliographic mechanisms and resources support in the light of modern technology and the user education programme can also initiate and sustain their interest in keeping track of their required information.

Key Words: Information, Habits, Social Sciences, Scientists, Internet, etc.

INTRODUCTION

Information Gathering Habits (IGH) is an area of active interest among librarians, Information Scientists and Social Scientists. It results from the recognition of some need perceived by the user, who as a consequence makes demand upon formal systems such as libraries information centers, on-line services or some other person in order to satisfy the perceived need.

The study of Information Gathering Habits (IGH) can be dated back to the late 1940s. Since that time a large number of studies have came out on the various aspects of Information Gathering Habits (IGH). There is a considerable amount of literature on the Information Gathering Habits of Social Scientists which has been extensively reviewed.

Information Gathering Habits: - Definition

The phrase "**Information Gathering Habits**" has been defined variously by different authors. The following definition of Information Gathering Habits will however, make the concept clearer:

According to Krikelas (1983), Information Gathering Habits refers to "Any Activity of an individual that is undertaken to identify a message that satisfies a perceived need"

REVIEW OF LITERATURE

Review of related literature is very essential in a new research topic. The Investigator reviewed only those studies, which are similar to the present study.

Paul A. Manda (1991) conducted a study under the title "Information Gathering Habits of Sociologists: A case study". The Objectives of the study were to investigate Information Gathering Habits of various users. Such studies are a foundation for the provision of efficient and effective library and information services. Questionnaires were sent to lectures in the Department of Sociology, University of Dares Salam to collect the data. Many information sources were used for this purpose: library subject catalogue, printed subject bibliographies. The results revealed that sociologists used various sources in tracking down information on research topics. This study revealed that language is the factor of influencing Information Gathering Habits. The information user need survey, must be an integral aspect of library service planning.

M Lalitha (1995) conducted a study under the title "Information Gathering Habits of Medical and Engineering Personnel: A comparative study with Reference to their Library use". The objectives of the study were: to identify, in quantitative terms, the various categories of Medical and Engineering personnel; to ascertain their Information requirements; to find out the sources and services, responses of the users towards the existing systems, the reading pattern of the two categories. Random samples were chosen from all the three groups and altogether 170 Questionnaires were distributed 70 to Group I and Group III and 100 to Group II. The attitude of the respondents in Group I and II was more encouraging than that of group III.

SCOPE OF THE STUDY

The scope of the study confines to the analysis of the information requirements of Social Scientists (means Ph.D. Students) in different departments in Jamia Millia Islamia, New Delhi. Information Gathering Habits is defined to include aspects like motives & purpose of Information Gathering the nature & types of Information sought the mode and mean to assess, search, identify and acquire information and use of their own as well as other libraries. There are total seven departments in the faculty of social sciences in University, out of which questionnaires were distributed to the respondents of Economics, Political Science, Psychology, Social Work, Sociology and Commerce & Business Studies.

OBJECTIVES OF THE STUDY

To know the frequency of Social Scientists to visit in the library.

To know the purpose of Social Scientists to visit in the library.

To know the strategy for searching the documents of Social Scientists.

To know the types of services uses by Social Scientists.

To know the user's opinion about the library facilities provided to Social Scientists.

To know from where most of social scientist collect the literature for their research.

HYPOTHESIS OF THE STUDY

There may be great differences in the Information Gathering Habits of Social Scientists.

A large number of Social Scientists are not utilizing the facilities and services available.

Many Social Scientists are ignorant about the Information Services provided by the library.

Most of the Social Scientists depend on primary sources of materials.

A small number of the Social Scientists are satisfied with the secondary sources of information in their respective fields.

Most of the Social Scientists are well aware of Internet and Online databases for gathering latest information in respective fields,

METHODOLOGY OF THE STUDY

There are several Survey Techniques available for user studies such as Questionnaire Methods, Personal Interview, Telephone Interview, Diary Method and Observation by self-etc.

SAMPLE POPULATION

The collection of data from the entire population of social scientists (means pursuing Ph.D.) is not very small to be adequately covered in a single study. Therefore, the total number of questionnaire distributed are 150 among 45 economics students, 28 Political Science, 42 Psychology, 25 Social Work, 4 Sociology and 6 Commerce & Business Studies Jamia Millia Islamia, New Delhi. During the academic year 2008-09. A total number of 127(84.67%) filled questionnaire were returned back and the invigilator selected 105 from these for the analysis of data from the various departments of faculty of social studies.

The Collection of large quantity of data from the entire population of Social Scientists (means Ph.D. students) in Jamia Millia Islamia, New Delhi is too large to be adequately covered in a single study.

Variable Taken:

In order to get the meaningful conclusion the following variables are analysed in detail: Economics Students, Political Science Students, Psychology Students, Social work Students, Sociology Students, Commerce and Business Studies Students

ANALYSIS OF DATA

The problem for the present study is **"Information Gathering Habits of Social Scientists in Jamia Millia Islamia, New Delhi"**.

The collected data are organized and tabulated by using statistical methods tables and percentages. This chapter deals with the analysis and interpretation of data collected through Questionnaire distributed to 150 Social Scientist who were studying in various disciplines of Faculty of Social Sciences of Jamia Millia Islamia, New Delhi. 127 filled Questionnaire were returned back. The Investigator selected 105 Questionnaires for the analysis.

Table 7.1: Frequency of the Visit of the Library

Students	Frequency					
	Daily	2-3 times in a week	Once in a Week	Occasionally	No Response	Total
Economics	11 (39.29%)	15 (53.57%)	–	2 (7.14%)	–	28 (100%)
Pol. Science	8 (38.10%)	9 (42.76%)	1 (4.76%)		3 (14.29%)	21 (100%)
Psychology	19 (55.88%)	12 (35.29%)	3 (8.82%)	–	–	34 (100%)
Social Work	11 (64.71%)	5 (29.41%)	1 (5.88%)	–	–	17 (100%)
Sociology	2 (100%)	–	–	–	–	2 (100)
Commerce & Business Studies	2 (66.67%)	1 (33.33%)	–	–	–	3 (100%)

Frequency of Visit to the Library

In order to assess the frequency of the visit to the library, the time gap has been classified in seven categories as shown in **Table 7.1.** On the analysis, it is observed that 11(39.21%) out of 28 respondents from Economics visited library daily, followed by 15(53.57%) respondents visited 2-3 times in a week and 2(7.14%) respondents visited occasionally.

Similarly, 8(38.10%) out of 21 respondents from Political Science visited library daily, 9(42.86%) respondents visited 2-3 times in a week, and 1(4.76%) respondents once in a week and 3(14.29%) respondents gave no response.

Similarly, 19(55.88%) out of 34 respondents from Psychology visited library daily, 12(35.29%) respondents visited 2-3 times in a week, and 3(8.82%) respondents visited once in a week.

Similarly, 11(64.71%) out of 17 respondents from Social Science visited library daily, 5(29.41%) respondents visited 2-3 times in a week, and 1(5.88%) respondents once in a week.

Similarly, 2(100%) respondents from Sociology visited library daily.

Similarly, 2(66.67%) out of 3 respondents from Commerce & Business Studies visited library daily, 1(33.33%) respondents visited 2-3 times in a week.

Table 7.2: Purpose of Visiting the Library

Students	Borrow Books	Consult Periodicals	Read Newspaper	Others	Total
Economics	16 (57.14%)	8 (23.57%)	1 (3.57%)	3 (10.71%)	28 (100%)
Pol. Science	9 (42.86%)	7 (33.33%)	2 (9.52%)	3 (14.29%)	21 (100%)
Psychology	21 (61.76%)	6 (17.65%)	2 (5.58%)	5 (14.71%)	34 (100%)
Social Work	12 (70.59%)	4 (23.53%)	–	1 (5.88%)	17 (100%)
Sociology	1 (50%)	1 (50%)	–	–	2 (100%)
Commerce & Business Studies	2 (66.67%)	1 (33.33%)	–	–	3 (100%)

Purpose of Visiting the Library

In order to assess the purpose of visiting the library by the students, the purpose have been classified into four different categories as shown in **Table 7.2.** On the analysis, it is observed that 16(57.14%) out of 28

respondents from Economics visited the library to borrow books, 8 (28.57%) respondents consulted periodicals, 1(3.57%) respondents read newspapers and 3(10.71%) respondents visited the library for other purposes.

Similarly, 9 (42.86%) out of 21 respondents from Political Science visited the library to borrow books, 7 (33.33%) respondents consulted the periodicals, 2(9.52%) respondents read newspapers and 3(14.29%) respondents visited the library for other purposes.

Similarly, 21 (61.76%) out of 34 respondents from Psychology visited the library to borrow books, 6 (17.65%) respondents consulted the periodicals, 2(5.88%) respondents read newspapers and 5 (14.71%) respondents visited the library for other purposes.

Similarly, 12 (70.59%) out of 17 respondents from Social Work visited the library to borrow books, 4 (23.53%) respondents consulted the periodicals, 1(5.88%) visited the library for other purpose.

Similarly, 1 (50%) out of 2 respondents from Sociology visited the library to borrow books and 1 (50%) respondents consulted the periodicals.

Similarly, 2 (66.67%) out of 3 respondents from Commerce & Business Studies visited the library to borrow books and 1 (33.33%) respondents visited the library to consulted periodicals.

Table 7.3: Strategy for Searching the Documents

Students	Author	Title	Subject	Other	No Response	Total
Economics	12 (42.86%)	3 (10.71%)	11 (39.29%)	2 (7.14%)	–	28 (100%)
Pol. Science	9 (42.86%)	4 (19.05%)	6 (28.57%)	2 (9.25%)	–	21 (100%)
Psychology	16 (47.06%)	7 (20.59%)	8 (23.53%)	2 (5.88%)	1 (2.94%)	34 (100%)
Social Work	9 (52.94%)	2 (11.76%)	4 (23.53%)	2 (11.76%)	–	17 (100%)
Sociology	1 (50%)	–	1 (50%)	–	–	2 (100%)
Commerce & Business Studies	2 (66.67%)	–	1 (33.33%)	–	–	3 (100%)

Strategy for Searching the Documents

In order to know the strategy for searching the documents within the library, the searching strategy have been classified into four categories as shown in **Table 7.3.** On the analysis, it is observed that 12(42.86%) out of 28 respondents from Economics year search documents by author, 3(10.71%) respondents by title, 11(39.29%) by subject and 2(7.14%) respondents search the documents by other method within the library.

Similarly, 9(42.86%) out of 21 respondents from Political Science search documents by author, 4(19.05%) respondents by title, 6(28.57%) by subject and 2(9.52%) respondents search the documents by other method within the library.

Similarly, 16(47.06%) out of 34 respondents from Psychology search documents by author, 7(20.59%) respondents by title, 8(23.53%) by subject and 2(5.88%) respondents search the documents by other method within the library and 1(2.94%) respondents gave no response. Similarly, 9(52.94%) out of 17 respondents from Social Work search documents by author, 2(11.76%) respondents by title, 4(23.53%) by subject and 2(11.76%) respondents search the documents by other method within the library. Similarly, 1(50%) out of 2 respondents from Sociology search documents by author and 1(50%) respondents by subject within the library.

Similarly, 2(66.67%) out of 3 respondents from Commerce & Business Studies search documents by author and 1(33.33%) respondents by subject within the library.

Table 7.4: Types of Services

Students→			Economics	Pol. Science	Psychology	Social Work	Sociology	Commerce & Business Studies
Lending Services	Books	Yes	28 (100%)	20 (95.24%)	34 (100%)	17 (100%)	2 (100%)	3 (100%)
		No	–	1(4.76%)	–	–	–	–
	Periodicals	Yes	22 (78.57%)	19 (90%)	28 (82.35%)	15 (88.24%)	2 (100%)	3 (100%)
		No	6 (21.43%	9 (42.86%)	6 (17.65%)	2 (11.76%)	–	–
ILL Services		Yes	–	–	–	–	1 (50%)	2 (66.67%)
		No	28 (100%)	21 (100%)	34 (100%)	17 (100%)	1 (50%)	1 (33.33%)
Ref. & Inf. Services		Yes	18 (64.29%)	17 (80.95%)	30 (88.24%)	13 (76.47%)	2 (100%)	3 (100%)
		No	10 (35.71%)	11 (52.38%)	4 (14.29%)	4 (23.53%)	–	–
Bibliographic Services		Yes	14 (50%)	18 (85.71%)	29 (85.29%)	14 (82.35%)	2 (100%)	3 (100%)
		No	14 (50%)	10 (47.62%)	5 (14.71%)	3 (17.64%)	–	–
Internet Services		Yes	21 (75%)	21 (100%)	34 (100%)	17 (100%)	2 (100%)	3 (100%)
		No	7 (25%)	–	–	–	–	–
CD-ROM Services		Yes	12 (42.86%)	15 (71.43%)	13 (38.24%)	14 (82.35%)	1 (50%)	2 (66.67%)

	No	16 (57.14%)	13 (61.90%)	21 (61.76%)	3 (17.64%)	1 (50%)	1 (33.33%)
Reprographic Services	Yes	19 (67.86%)	13 (61.90%)	23 (67.65%)	11 (64.71%)	2 (100%)	3 (100%)
	No	9 (32.14%)	15 (71.43%)	11 (32.35%)	6 (35.29%)	–	–
Microfilm Services	Yes	–	–	–	–	–	–
	No	28 (100%)	21 (100%)	34 (100%)	27 (100%)	2 (100%)	3 (100%)
Online Access to Books & Journals	Yes	17 (60.71%)	20 (95.24%)	27 (79.41%)	10 (58.82%)	2 (100%)	3 (100%)
	No	11 (39.29%)	1 (4.76%)	7 (20.59%)	7 (41.18%)	–	–

Types of Services

Table 7.4 indicates the services provided to various disciplines of students of Faculty of Medicine. It is observed that 28(100%) respondents from Economics gave their responses in Yes to the lending services of books and 22(78.57%) out of 28 respondents gave their responses in Yes to the lending services of periodicals. Similarly, 18(64.29%), 14(50%), 21(75%), 12(42.86%), 19 (67.86%) and 17(60.71%) respondents gave their responses in Yes about the awareness of reference and information services, bibliographic services, Internet services, CD-ROM services, reprographic services and Online access of books & journals of Medical library respectively.

Similarly, 20 (95.24%) out of 21 respondents from Political Science gave their response in Yes to the lending services of books and 19(90%) respondents gave their responses in Yes to the lending services of periodicals. Similarly, 17(80.94%), 18(85.71%), 21(100%), 15(71.43%), 13(69.90%) and 20(95.24%) respondents gave their responses in Yes about the awareness of reference and information services, bibliographic services, Internet services, CD-ROM services, reprographic services and Online access of books & journals of Medical library respectively.

Similarly, 34(100%) respondents from Psychology gave their response in Yes to the lending services of books and 28(82.35%) out of 34 respondents gave their responses in Yes to the lending services of periodicals. Similarly, 30(88.24%), 29(85.29%), 34(100%), 13(38.24%), 12(67.65%) and 27(79.41%) gave their responses in Yes about the awareness of reference and information services, bibliographic services, Internet services, CD-ROM services, reprographic services and Online access of books & journals of Medical library respectively.

Similarly, 17(100%) respondents from Social Work gave their response in Yes to the lending services of books and 15(88.24%) out of 17 respondents gave their responses in Yes to the lending services of periodicals. Similarly, 13(76.47%), 14(82.35%), 17(100%), 14(82.35%),

11(64.71%) and 10(58.82%) gave their responses in Yes about the awareness of reference and information services, bibliographic services, Internet services, CD-ROM services, reprographic services and Online access of books & journals of Medical library respectively.

Similarly, 2(100%) out of 2 respondents from Sociology gave their response in Yes to the lending services of books and 2(100%) out of 2 respondents gave their responses in Yes to the lending services of periodicals. Similarly, 1(50%), 2(100%), 2(100%), 1(50%), 2(100%) and 2(100%) respondents gave their responses in Yes about the awareness of ILL services, reference and information services, bibliographic services, Internet services, CD-ROM services, reprographic services and Online access of books & journals of Medical library respectively.

Similarly, 3(100%) out of 3 respondents from Commerce & Business Studies gave their response in Yes to the lending services of books and 3(100%) out of 3 respondents gave their responses in Yes to the lending services of periodicals. Similarly, 2(66.67%), 3(100%), 3(100%), 2(66.67%), 3(100%) and 3(100%) respondents gave their responses in Yes about the awareness of ILL services, reference and information services, bibliographic services, Internet services, CD-ROM services, reprographic services and Online access of books & journals of library respectively.

Table 7.5: User's Opinion

Students→		Economics	Pol. Science	Psychology	Social Work	Sociology	Commerce & Business Studies
Membership Fee	Yes	26(92.86%)	21(100%)	30(88.24%)	17(100%)	2(100%)	3(100%)
	No	2(7.14%)	_	4(19.05%)	_	_	_
Opening hours	Yes	28(100%)	21(100%)	34(100%)	17(100%)	2(100%)	3(100%)
	No	_	_	_	_	_	_
Reservation facility	Yes	18(64.29%)	20(71.42%)	29(85.29%)	16(94.12%)	2(100%)	3(100%)
	No	10(35.71%)	1(4.76%)	5(14.71%)	1(5.88%)	_	_
Location	Yes	28(100%)	21(100%)	34(100%)	17(100%)	2(100%)	3(100%)
	No	_	_	_	_	_	_
Internet Service	Yes	_	2(7.52%)	_	4(23.53%)	2(100%)	2(66.67%)
	No	28(100%)	19(90.47%)	34(100%)	13(76.47%)	_	1(33.33%)

User's Opinion

In order to know the user's opinion about the membership fee, opening hours, reservation facility, location and Internet services are convenient or not, five categories have been formed as shown in **Table 7.5** On the analysis, it is observed that from Economics, 26(92.86%) respondents out of 28 are satisfied with the library membership fee and 28(100%) respondents are satisfied with location of the library 28(100%) respondents are satisfied with the opening hours of library and 18(64.29%) respondents are satisfied with the reservation facility and no one is satisfied with the Internet services of the library.

From Political Science, 21(100%) respondents out of 21 are satisfied with the library membership fee and 21(100%) respondents are satisfied with the opening hours of library and 21(100%) respondents are satisfied with the location of the library and 20(98.24%) respondents are satisfied with reservation facility and 2(9.52%) respondents are satisfied with the Internet services of the library.

From Psychology, 30(88.24%) respondents out of 34 are satisfied with the library membership fee and 34(100%) respondents are satisfied with the opening hours of library and 34(100%) respondents are satisfied with the location of the library and 29(85.29%) respondents are satisfied with reservation facility and no one is satisfied with the Internet services of the library.

From Social Work, 17(100%) respondents out of 17 are satisfied with the library membership fee and 17(100%) respondents are satisfied with the opening hours of library and 17(100%) respondents are satisfied with the location of the library and 16(94.12%) respondents are satisfied with reservation facility and 4(23.53%) respondents are satisfied with the Internet services of the library.

From Sociology, 2(100%) respondents out of 2 are satisfied with the library membership fee and 2(100%) respondents are satisfied with the opening hours of library and 2(100%) respondents are satisfied with the location of the library and 2(100%) respondents are satisfied with reservation facility and 2(100%) respondents are satisfied with the Internet services of the library.

From Commerce & Business Studies, 3(100%) respondents out of are satisfied with the library membership fee and 3(100%) respondents are satisfied with the opening hours of library and 3(100%) respondents are satisfied with the location of the library and 3(100%) respondents are satisfied with reservation facility and 2(66.67%) respondents are satisfied with the Internet services of the library.

Table 7.6: Internet Café for Literature Search

Students	Yes	No
Economics	19(67.86%)	9(32.14%)
Pol. Science	15(71.43%)	6(28.57%)
Psychology	28(82.35%)	6(17.65%)
Social Work	16(94.12%)	1(5.88%)
Sociology	2(100%)	–
Commerce & Business Studies	3(100%)	–

Internet Café for Literature Search

Table 7.6 indicates the Internet café for literature search by the Social

Scientists. 19% (67.86%) out of 28 respondents Economics visited Internet Café for literature search.

Similarly, 15% (71.43%) out of 21 respondents Political Science visited Internet Café for literature search. Similarly, 28% (82.35%) out of 34 respondents Psychology visited Internet Café for literature search. Similarly, 16% (94.12%) out of 17 respondents Social Work visited Internet Café for literature search. Similarly, 2% (100%) out of 2 respondents Sociology visited Internet Café for literature search. Similarly, 3% (100%) out of 3 respondents Commerce & Business Studies visited Internet Café for literature search.

CONLUSION AND SUGGESTIONS

CONCLUSION

The Study sought to examine the Information Gathering Habits of Social Scientists in Jamia Millia Islamia, New Delhi by taking samples from various disciplines of Faculty of Social Sciences to get an overview of the Information Gathering Habits of the Social Scientists.

Most of the objectives are met within the results. Information Gathering Habits is likely to differ from one discipline to another and among levels of status, such as Economics, Political Science, Psychology, Social Work, Sociology and Commerce & Business Studies.

Based on the analysis of the survey, the following findings can be arrived at:

1. Most of the students from various departments visit the library visit the library daily/ 2-3 times in week, a very small number of students visit the library once in week/ occasionally, as depicted in **Table 7.1**
2. Most of the students from various departments visit the library to borrow the books while less number of students consults periodicals to keep abreast with the latest findings. A very small number of students visit the library to read newspapers and for other purposes, as depicted in **Table 7.2**
3. Approximately 50% students from various departments search the documents by author within the library, as depicted in **Table 7.3**
4. Lending Services of Books and periodical, Internet services, reprographic services and Online access to books and journals are the most well known services among the various departments of the students while the students are not aware of ILL services, CD-ROM services and Microfilm services of the library, as depicted in **Table 7.4**

5. 100% students from various departments are satisfied by the opening hours of the library and 100% students from various disciplines are also satisfied with the location of the library while a very small number of the students are satisfied with the Internet facility of the library, as depicted in **Table 7.5**
6. Most of the students have to go Internet café for Literature search, as depicted in **Table 7.6**

The findings derived from the study are based on a sample of 105 Social Scientists (means Ph.D. students) belongs to various disciplines and differences in the information Gathering Habits among the Social Scientists.

SUGGESTIONS

It is seen that user's awareness of sources and services are less among the Social Scientists (means Ph.D. Students). The poor shape of library and information units, the absence of technological application coupled with the financial and other reasons obviously are the reasons for the lack of users' awareness. So it is suggested that:

1. User education programme must be conducted regularly to train the users about using the different types of information tools and services, so as to put the varied library resources to optional use.
2. In order to remove the ignorance the libraries must come forward to understand the actual needs and exact area of interest of students.
3. Document delivery services and CAS services should be provided.
4. The Library should frequently provide CD-ROM databases, online access to books & journals and Internet services.
5. In order to update and generate knowledge of students, various scientific and professional seminars, conferences, workshops and exhibitions at departmental level levels should be conducted.
6. As it is revealed that journals are the most used sources by the Social Scientists to update their knowledge, library should pay more attention towards subscribing more core journals in various disciplines.
7. As it is realized that library has the most useful collection for various department of Social Scientists, it is necessary to update the collection by adding latest documents.
8. Internet facility should be improved by adding number of computers.
9. Before providing the services, it is essential to maintain the library;

building also plays an important role in extending efficient services.

10. The study can be extended to all the facilities and all the departments of the university.

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Information Seeking Behavior: A Comparative Study

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ABSTRACT

Information seeking behavior is an area of active interest among librarians, information scientists, communication scientists, sociologists and psychologists." Information seeking behavior results from the recognition of some need, perceived by the user, who as a consequence makes demands upon formal systems such as libraries, information centers, on-line services or some other person in order to satisfy the perceived need. Information seeking behavior refers to any activity of an individual that is undertaken to identify a message that satisfies a perceived need".

An attempt has been made in this study to examine the Information-seeking Behavior of three B-Schools library users namely Jaipuria Institute of Management (Noida), IMI (New Delhi) and IMT (Ghaziabad). In this Study, the mode of collection of data, its presentation, analysis and interpretation is also presented. The primary data for this study has been collected through a questionnaire survey of 100 students belonging to three B-Schools. The study reveals the frequency of visits to the library, purpose of visiting the library, types of services, sources used to locate certain documents, strategy for searching the documents sources etc.

INTRODUCTION

Information in all levels remains the life –blood of any organization, and the twenty first century has witness's remarkable evolution as edicient in considerable large increase of technology.

Information seeking behavior is a broad term, which involves a set of actions that an individual takes to express information needs, seek information, evaluate and select information, and finally uses this information to satisfy his/her information needs. Various factors may determine the information seeking behavior of an individual or a group of individuals. It is therefore, desirable to understand the purpose for which information is required, the environment in which the user operates users' skills in identifying the needed information, channels and sources preferred for acquiring information.

The literature is about the information-seeking behavior of the students is extensive. Many studies have been conducted to investigate the information-seeking behavior of library users based on their subject interest, occupation, information environment, and geographical location.

OBJECTIVE

This study attempts to achieve the following objectives:

- To identify the frequency of visits to the library.
- To an existing pattern of information seeking behavior of students.
- To ascertain the information requirement of the students.
- To identify some of the factors influencing information seeking behavior of students.
- To identify what strategy they use for searching the information.
- To find out the information sources and services that exist to satisfy the information needs to the students.

METHODOLOGY OF THE STUDY

Keeping in view the objective in mind, a questionnaire was prepared to collect data form the students of respective B-Schools.100 copy of questionnaire were distributed to each B-School library users .We received fully filled questionnaire form from, JIM library get 78/100, IMT library we get 58/100 and IMI we get 74/100. We discarded half filled questionnaires. The analysis and interpenetration of the data is presented in the following way.

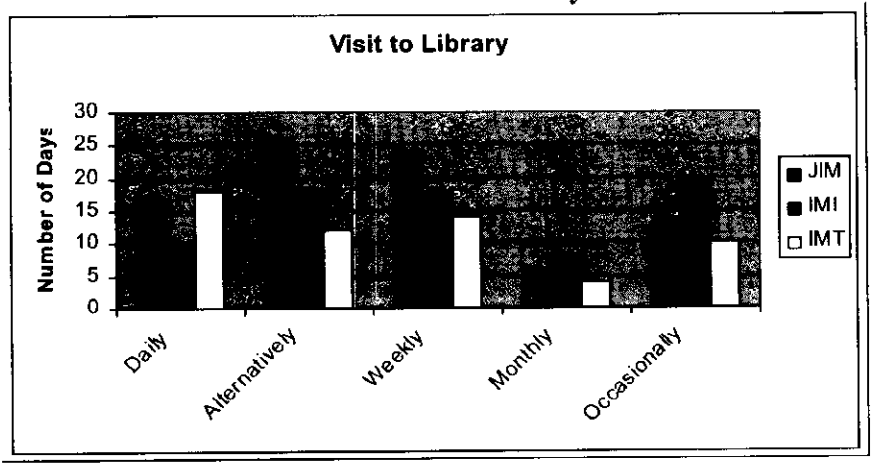
DATA ANALYSIS

Visit to Library – The frequency of visits to library of three B-schools is showing through table 1 and chart 1.It is evident that IMT library users visiting their library daily as comparison to JIM library and IMI Library. Alternatively and weekly JIM library got higher rank. In Monthly and occasionally visits IMI is highest.

Table 1- Visit to library

Visit to Library	JIM	IMI	IMT
Daily	17	10	**18**
Alternatively	**26**	18	12
Weekly	**24**	18	14
Monthly	6	**8**	4
Occasionally	13	**20**	10

Chart -1 Visit to library

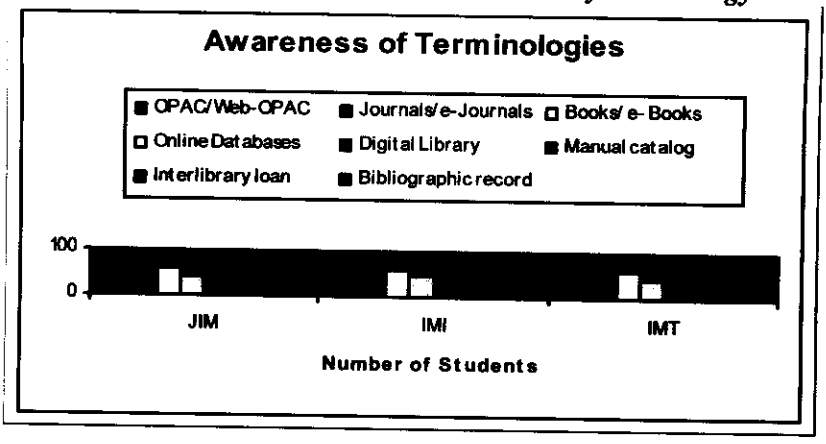


Awareness about the Library terminology –Table 2 shows that JIM Library users are more familiar with the library terminology such as Journals/e-journals, Books/e-books, Online Databases, Digital library, Manual catalogue and ILL etc. as comparison with other Libraries .

Table 2- *Awareness about the Library terminology*

Awareness of following terminologies	JIM	IMI	IMT
OPAC/Web-OPAC	16	4	**36**
Journals/e-Journals	**73**	60	52
Books/ e- Books	**61**	58	56
Online Databases	42	**46**	40
Digital Library	**42**	32	30
Manual catalog	**17**	6	16
Interlibrary loan	**2**	**2**	**2**
Bibliographic record	16	**18**	**18**

Chart 2-- *Awareness about the Library terminology*

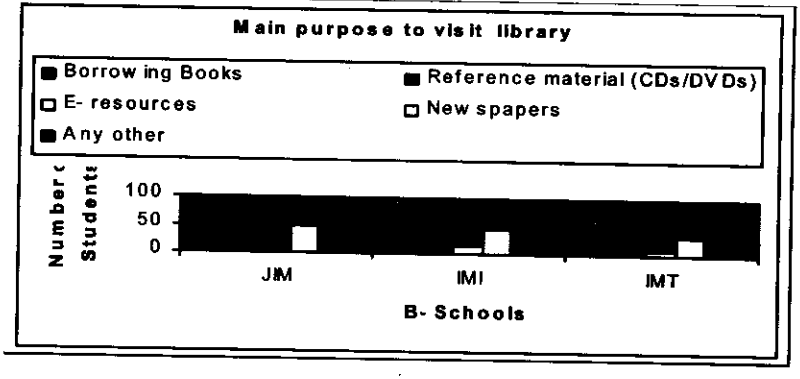


Main purpose to visits the library – Table 3 tells that borrowing books is the main purpose of all three libraries users; second purpose to visit the library is Newspaper among all three libraries and the Reference material last is the last approach. If we talk about the use of e- resources then found that they are highly in use by IMI library users and very less used by Jaipuria library users.

Table 3- Main purpose to visit the library

Main purpose to visit the library	JIM	IMI	IMT
Borrowing Books	**67**	**38**	**36**
Reference material (CDs/DVDs)	**17**	16	14
E- resources	1	**16**	8
Newspapers	**48**	46	32
Any other, please specify.....	14	28	32

Chart 3- Main purpose to visit the library

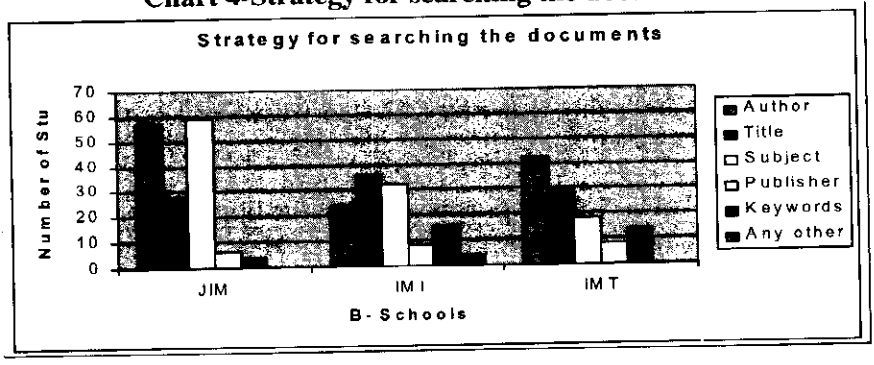


Strategy for searching the documents- Table 4 explains that subject approach is higher than any other approach .It is next followed by author and title.

Table -4 Strategy for searching the documents

Strategy for searching the documents	JIM	IMI	IMT
Author	**57**	24	42
Title	28	**36**	30
Subject	**59**	32	18
Publisher	6	**8**	**8**
Keywords	4	**16**	14
Any other...		4	

Chart 4-Strategy for searching the documents

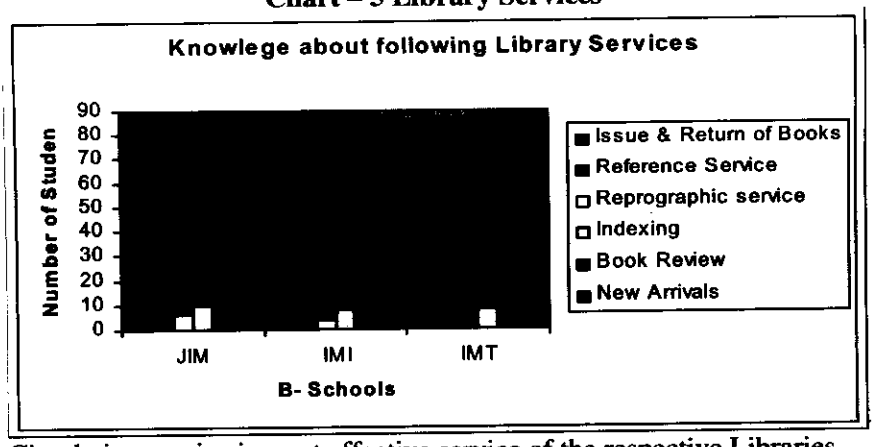


Library services – Table 5 reveals that Circulation services is mostly used by all the three libraries at a high level, followed by New arrivals and Reference service respectively.

Table-5 Library services

Library Service	JIM	IMI	IMT
Issue & Return of Books	**78**	64	56
Reference Service	**29**	16	14
Reprographic service	**6**	4	-
Indexing	**10**	8	8
Book Review	**20**	10	10
New Arrivals	**45**	22	26

Chart – 5 Library Services

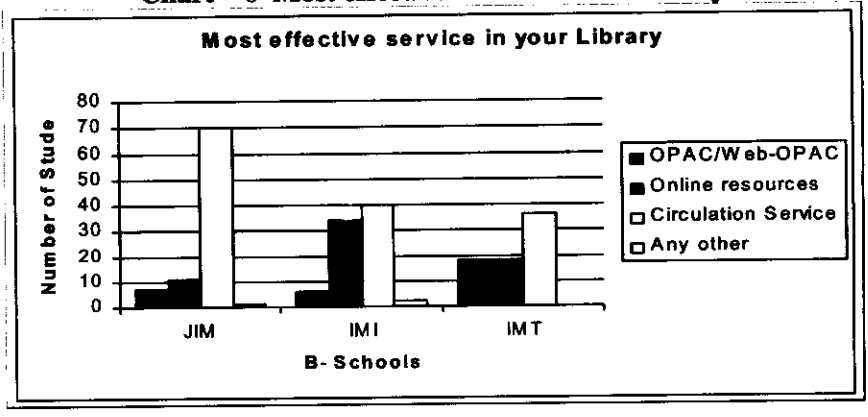


Circulation service is most effective service of the respective Libraries.

Table-6 Most effective service of the Library

Most effective service in your Library	JIM	IMI	IMT
OPAC/Web-OPAC	7	6	**18**
Online resources	11	**34**	18
Circulation Service (Issue and Return)	**70**	40	36
Any other....	1	2	

Chart – 6 Most effective service of the Library

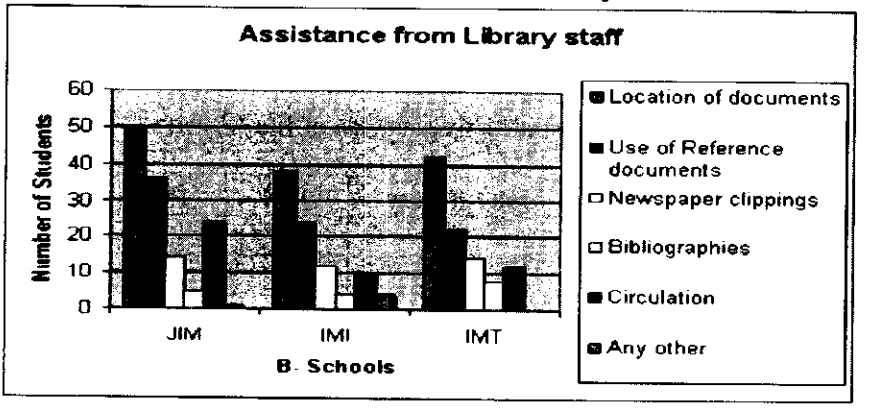


Assistance from Library Staff - Table 7 explores that mostly JIM Library users are taking the help of library staff in respective to the location of documents in the library, use of reference books, circulation etc.

Table 7- Assistance from Library Staff

Assistance from library staff	JIM	IMI	IMT
Location of documents	**50**	38	42
Use of reference documents	**36**	24	22
Newspaper clippings	**14**	12	**14**
Bibliographies	5	4	**8**
Circulation	**24**	10	12
Any other.....	1	**4**	

Chart 7 – Assistance from Library staff

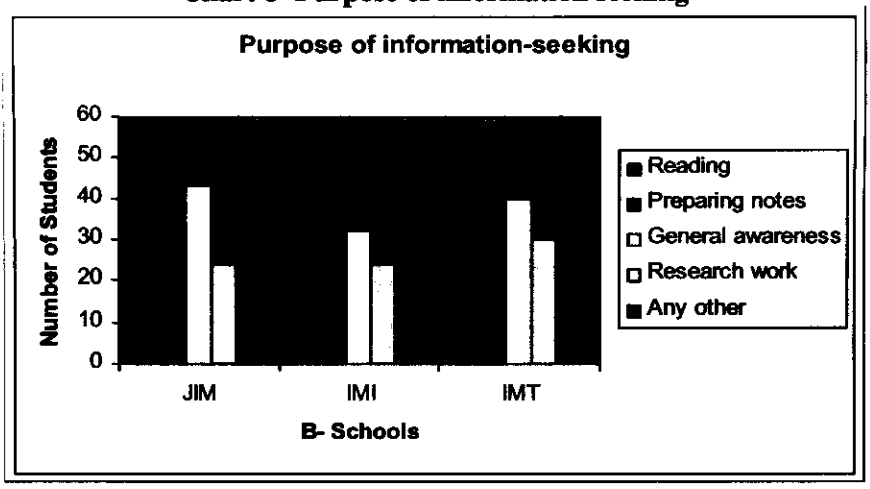


Purpose of information seeking - From the table 8 it has been observe that reading is the top most purpose of information seeking and further followed by general awareness, making notes, research work etc.

Table 8- Purpose of information seeking

Purpose of information-seeking	JIM	IMI	IMT
Reading	53	**54**	46
Preparing notes	**40**	34	28
General awareness	**43**	32	40
Research work	**24**	**24**	30
Any other.....	2	4	2

Chart 8- Purpose of information seeking

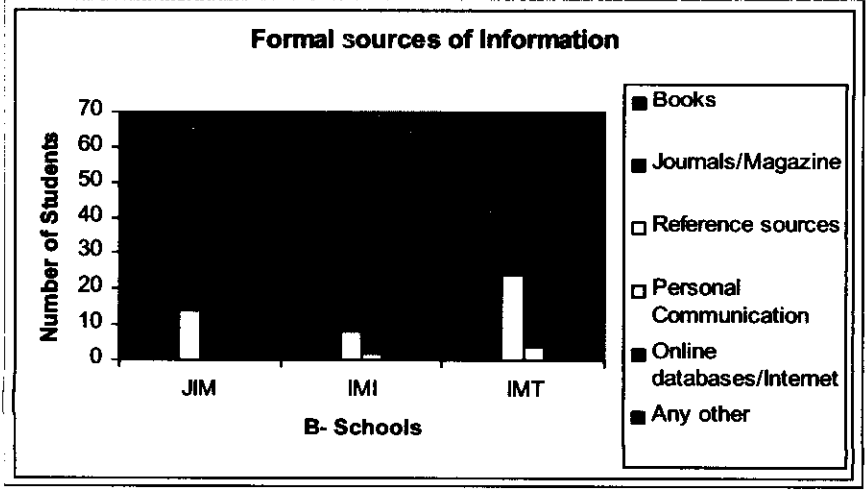


Formal source of information – Table 9 explains that books are the best formal source of information among the respective libraries users.

Table 9-Formal source of information

Your formal sources of Information	JIM	IMI	IMT
Books	**65**	50	54
Journals/Magazine	50	**66**	34
Reference sources	14	8	**24**
Conference proceedings	-	2	4
Online databases/Internet	**33**	32	26
Any other……	1	**2**	-

Chart 9-Formal source of information

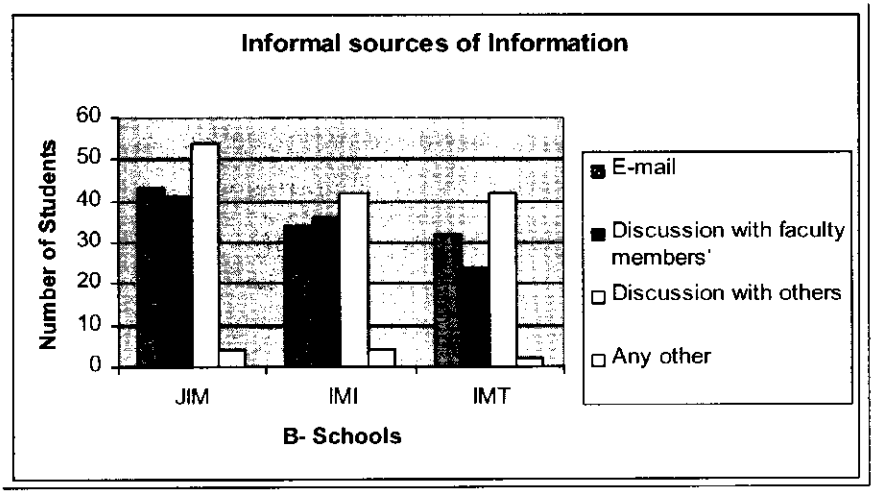


Informal source of information -Table 10 reveals that discussion with the other is the quiet good informal source of information among all three library users.

Table 10- Informal source of information

Your informal sources of Information	JIM	IMI	IMT
E-mail	**43**	34	32
Discussion with faculty members'	**41**	36	24
Discussion with others	**54**	42	42
Any other.....	**4**	**4**	2

Chart 10- Informal source of information

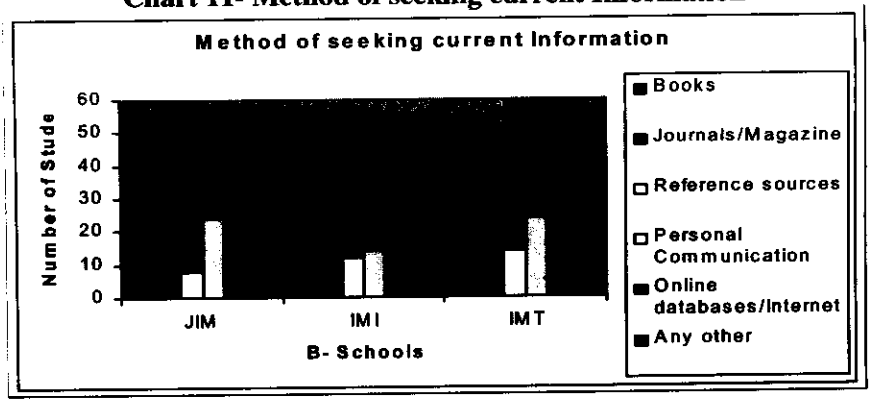


Method of seeking current Information- **Table 11- Method of seeking current Information-** Table 11 presents that journals and magazine are the best media of seeking current information, further followed by online databases and internet among the respective Libraries.

Table 11- Method of seeking current Information

Method of seeking current Information	JIM	IMI	IMT
Books	33	**44**	30
Journals/Magazine	**55**	48	42
Reference sources	8	12	**14**
Personal Communication	**24**	14	**24**
Online databases/Internet	**37**	22	30
Any other.....	6	-	4

Chart 11- Method of seeking current Information

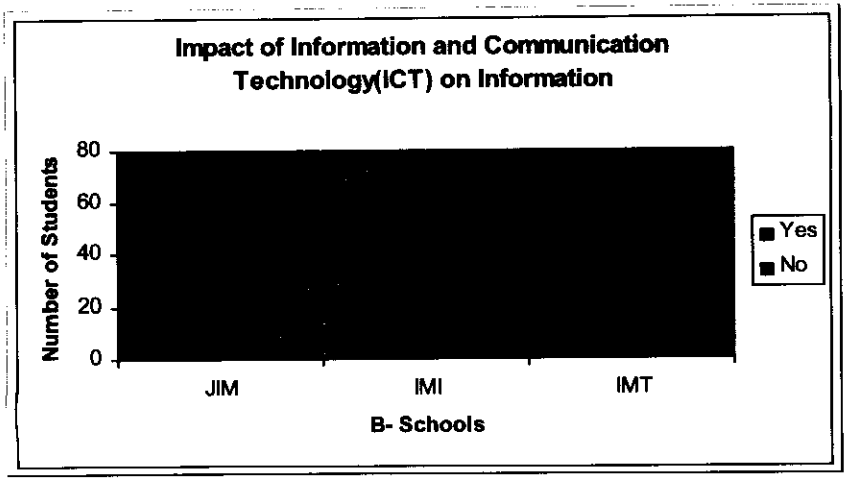


Impact of Information and Communication Technology (ICT) on ISB –Table 12 reflects that every library users are accepting the impact of IT on Information seeking behavior.

Table 12 – Impact of Information and communication technology on ISB

Impact of Information and Communication Technology(ICT) on Information	JIM	IMI	IMT
Yes	72	68	52
No	6	6	6

Chart 12- Impact of Information and communication technology on ISB



SUGESSTIONS

The most important aspect is that there should be proper training for creating awareness and use of existing sources in the respective fields. User education must be conducted regularly to train the users about using the different types of information tools and services, so as to put the varied library resources to optimal use.

CONCLUSION

The core of the library profession remains the same, but methods and tools for information delivery continue to grow and change dramatically. Libraries must understand information seeking behavior of users to re-engineer their services and provide information efficiently. The result of this study shows how to remove ignorance of library services among users. Libraries must understand the actual needs and exact areas of interest of users, so as to increase library services effectively.

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Information Seeking Behaviour: A Human Activity and Consciousness

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ABSTRACT

Information seeking is the process or activity of attempting to obtain information in both human and technological contexts. Information seeking is related to, but yet different from, information retrieval (IR). The information seeking behaviour (ISB) essentially refers to the strategies and actions undertaken to locate discrete knowledge elements. It is concerned with the interactive utilization of the three basic resources namely people, information and system. Information seeking is a human process that requires adaptive and reflective control over the afferent and efferent action of the information seeker. Information seeking behaviour (ISB) resulted from the recognition of some gap in information perceived by the user, who as a consequence makes demand upon from systems such as libraries/ information centers, or some other systems in order to satisfy the perceived information need to fill the gap.

INTRODUCTION

Information is the basic material for the decision making process. The essential purpose of every decision is to transform information into action efficiently and effectively. Line (1974) revealed that information need arises when a person finds a gap in his/her state of knowledge is to be resolved and wisher to resolve the anomaly.

Information seeking is a kind of communication behaviour, which would be influenced by many factors. The information seeking behviour is used

here to include all activities comprising information seeking, information gathering, information retrieving and communication activities performed in the library.

Information seeing behaviour includes aspects like motives and purpose of information seeking, the nature and types of information south, the mode and means to access information, identify, search and acquire information and use of libraries and information system by the user. The process takes place in information seeking behaviour are; identifying, objectives, defining needs, accessing information, establishing sources of information acquisition, satisfaction and dissatisfaction. Now a days information seeking behaviour is an area of active interest among the librarians scientists.

Method of seeking information comprises of formal as well as informal method. Formal methods include consultation of documentary sources e.g. books, research reports, thesis, library catalogue etc. While informal methods included discussion with experts, co-researchers, librarians, attending conferences. etc.

THEORIES OF INFORMATION SEEKING BEHAVIOUR

A variety of theories of information behaviour - eg. Zipf's Principle of Least Effort, Brenda Dervin's Sense Making, Elfreda Chatman's Life in the Round - seek to understand the processes that surround information seeking.

A review of the literature on information seeking behaviour shows that information seeking has generally been accepted as dynamic and non-linear (Foster, 2005; Kuhlthau 2006). People experience the information search process as interplay of thoughts, feelings and actions (Kuhlthau, 2006).

Information seeking has been found to be linked to a variety of interpersonal communication behaviours beyond question-asking, to include strategies such as candidate answers.

INFORMATION SEEKING IN DIFFERENT CONTEXTS

Much LIS research has focused on the information seeking practices of practitioners within various fields of professional work. Studies have been carried out into the information-seeking behaviours of librarians, academics, medical professionals, engineers and lawyers (among others). Much of this research has drawn on the work done by Leckie, Pettigrew (now Fisher) and Sylvain, who in 1996 conducted an extensive review of the Library and Information Science (LIS) literature (as well as the literature of other academic fields) on professionals' information seeking. The authors proposed an analytic model of professionals' information seeking behaviour, intended to be generalizable across the professions,

thus providing a platform for future research in the area. The model was intended to "prompt new insights... and give rise to more refined and applicable theories of information seeking" (1996, p. 188). The model has been adapted by Wilkinson (2001) who proposes a model of the information seeking of lawyers.

INFORMATION RETRIEVAL

Traditionally, IR tools have been designed for IR-professionals to enable them to effectively and efficiently retrieve information from a source. It is assumed that the information exists in the source and that a well-formed query will retrieve it (and nothing else). It has been argued that laypersons' information seeking on the web is very different from information retrieval as performed within the IR discourse. Yet, web search engines are build on IR principles. Since the late 1990s a body of research on how casual users interact with web search engines is beginning to form but the topic is far from fully understood. IR can be said to be technology-oriented, focusing on algorithms and issues such as precision and recall. Information seeking may be understood as a more human-oriented and open-ended process than information retrieval. In information seeking, one does not know whether there exists an answer to one's query, so the process of seeking may provide the learning required to satisfy one's information need.

HUMAN ACTIVITY AND PROCESS

In exploring the applicability of activity theory in this way, I became somewhat dissatisfied by the rather static character of the diagrammatic representations. Certainly, flows of information, action, influence, etc., are represented in the arrowed lines leading to and from the nodes, but the process is not altogether clear.

Knowledge of information seeking strategies or behaviour of Human is very important to each library professional. But, limited work has been done on this aspect in India. Keeping this point in view, efforts have been made to review the information available on this work pertaining to different aspects under following sections.

- Information seeking behaviour
- Expectations of human's
- Satisfaction and Dissatisfaction of human's

(I) Information seeking behaviour

The key to the development of individual and society is information. Our society is gradually changing into information society, which according to Prof. William Martin 'a society in which quality of life as well prospects of social change and economic development depend increasingly upon information and its exploitation.

Information seeking behaviour study is nothing but the study of flow of information among the users and information system. This from starts with purposes and motives and ends with satisfaction or dissatisfaction. An individual may seek information as stimulus and to obtain reaction to his own work. He may provide information in order to advance his won ideas, career of reputation. According to Kriklas (1983) information seeking behaviour begins with a "perceived need" which is like anomalous state of knowledge.

The information seeking behaviour involves activities that will satisfy the information need. When the need is no longer perceived, the individual quit the chosen information seeking process. The process is dynamic and methods of collecting information consume time and demands for immediate results. According to Rouse and Rouse (1984) the ways of selecting and collecting information are related to the personal habits and styles of the information seekers. Brown (1991) have made an efforts on general seeking behaviour and concluded that the information seeking is a goal-driven activity in which needs are satisfied through problem solving.

Installing the reading habits and providing an adequate supply of books to its users are considered as the fundamental duty of any library and information system. Burman and Khan (2004) studied the role of library and information system in order to highlight the reading habits among the users and their problems on various aspects. He also suggests the steps to develop healthy reading habits among the users, through which librarians may ensure maximum user of library collection within the available resources.

In recent times the developing countries like India have realized the importance of information and are investing in the design and development of information infrastructure and enhancing the efficiency and effectiveness of the existing information systems. According to Krishnamutthy (2004) information is the basic material for the decision making process. The essential purpose of every decision is to transform information into action efficiently and effectively. Information seeking is a kind of communication behaviour, which would be influenced by many factors. He were also described various factors of information sources and information seeking behaviours.

EXPECTATIONS OF HUMAN'S

Library is considered to be the most important facilities required for the effective teaching and learning process in higher educational institution and universities are aimed to preparing students for higher levels of studies, research and a variety of jobs. In fact it is the library, which assists the higher educational institutions to obtain their objectives by providing good collection of information resources and services.

Every human will have some expectations about his/her library, and these expectations may be a reflection of what he/she has already received from his/her institution, college, public, medial information sources and other libraries. Assessing the expectation of human's is very difficult job as there is no suitable tool.

Now human's expectation and perceptions are largely analyzed as a pert of measuring service quality in library. The SERVQUAL technique developed by Parasuraman *et al.* (1994) is totally based on customer's expectations and perceptions about a service. It is assumed that quality is equal to the minus of expectations from perceptions (Q=P-E).

(III) Satisfaction & Dissatisfaction of Human's

User is very important factor in the library therefore care should be taken at a right time. Datta (1981) says "As a librarian I suggest that we would care more for the students who do not care for a long time we neglected them and concentrated all our energies for the use of a handful for scholars and students in comparison with the total. This way of centralizing academic energies has its disastrous effect in the long run it is the time to think the problem and change our attitude.

The use of the 'tools' circle may be thought excessive but, in fact, it serves the useful purpose of drawing attention to questions that one might wish to ask. For example, How are the norms that affect this activity transmitted within the community? What tools are used by subjects to communicate with one another their experience in the activity? How do the subjects organize the division of labour between themselves and to what extent is this affected by decisions of the community to which they belong and by the norms of behaviour as they affect this activity?

Although this harmonized diagram was useful in enabling a deeper understanding of activity theory, I still felt that the process element was lacking. Also, Bedny locates 'Goal' in a position that is at variance with all formulations of activity theory, while Engeström omits it from his diagram. 'Goal' is seen by Leont'ev and others as something that promotes activity, not something that is directly affected by activity. Motivation and Goal establish the preconditions for activity. Once this was established, a process model of activity emerged relatively easily.

ACTIVITY THEORY AND INFORMATION BEHAVIOUR

At this point, the reader is likely already to have a fairly clear perception that activity theory can apply to the study of information behaviour; however, some examples of the way it might be applied may be useful. The AIMTech Research Group at Leeds University Business School in the *UK* has adopted activity theory as a framework for its research and

consultancy work. After a number of studies it was felt that the existing framework within which work was being pursued left some things unexplored and activity theory presented itself as potentially useful. AIMTech's work is concerned primarily with the investigation of mobile information systems in the emergency services in the UK - police forces, ambulance services and fire and rescue services. A review of this work suggested that, if activity theory had been adopted as the conceptual framework at the outset, certain aspects of the studies would have been either developed further or would have been included instead of being omitted. As a result, activity theory now provides the framework for evaluating pilot studies and other implementations of mobile information systems and specific questions in the interview process directly address the elements of activity theory. Thus, we will ask about:

- the history of an innovation in the organization, to uncover previous attempts to implement technological change;
- the cultural context of the innovation, for example, the extent to which the advocates of innovation are aware of tensions in the organization that may prevent success and the extent to which the end users of the system are committed to the innovation;
- the rules and conditions under which the technology is to be applied (particularly important in police forces, where legislation guides all activity);
- the informal norms of behaviour in the affected work team(s) and how this might affect the innovation;
- the motivation for the innovation: for example, mobile systems may be introduced into a police force to reduce the time officers must spend in the police station, thereby enabling them to be more visible on the street;
- how the total activity system affects other activity systems in the organization: for example, providing a police officer with information at the point of need has implications for supervision, for the activities of the control room and for the provision of the underlying communications technologies.

In this way a much deeper understanding is gained of the context of the information needs and information uses that are associated with the implementation of the new technology and the evaluation process can bring to the fore aspects of the organizational setting that affect the innovation but might otherwise be missed.

ACTIVITY THEORY: FROM EDUCATION TO INFORMATION SCIENCE

Largely as a consequence of the significance of Vygotsky's work in developmental psychology and the theory of learning, activity theory

first made its appearance in the West in the field of educational research. Here, Vygotsky's concept of the Zone of Proximal Development gained attention, partly by the re-presentation of Russian work and subsequently through independent work, (e.g., Rogoff & Wertsch 1984 ; Exner 1990; Salomon *et al.* 1989).

Education was also the initial field of research of Yrjö Engeström, who is probably the best known of the Western interpreters of activity theory. Engeström's early work was almost entirely in Finnish and concerned to a large degree with ideas on the reform of educational practice, but he has moved from education in the narrow sense to the study of learning in work situations (Engeström 1994, 2000, 2001) and in the application of technology (Mwanza & Engeström 2005). This move has been accompanied by more publication in English.

More recently (and partly through the influence of Engeström's work), activity theory has found a place in human-computer interaction and information systems research. (Bødker 1989; Kuutti 1991; Kaptelinin 1994; Nardi 1996a; Kaptelinin *et al.* 1999; Ditsa 2003). Here, the dominant model of activity theory has been Engeström's, but an alternative representation of the theory (known as systemic-structural activity theory), by Bedny (2000), has also gained support. Bedny's conception of activity theory is derived from the work of successors to Vygotsky, and, in particular, from the work of Rubinshtein (e.g., 1957). Before his move to the USA, Bedny was at Kharkov University, an institution at which both Luria and Leont'ev had worked and he may be considered to be in the direct intellectual line of these founders of activity theory.

To date, information science researchers appear to have been slow to consider the usefulness of activity theory in their work. A search for 'activity theory AND information science' in the Web of Science revealed only one paper (Spasser 1999) and a broader search of LISA revealed eighteen papers, most of which were concerned with communications and information technology applications in education, rather than information science. Spasser's paper is very brief and simply sets out an argument for considering activity theory as an appropriate approach for information science, especially with regard to the interaction of people and computers. He notes: by explicitly recognizing and theorizing three broad classes of complexity-the stratified nature of the social world, the social contextualization and embeddedness of interaction, and the dynamism of development... AT is a promising new direction for the field of information science research. Conceptually, AT registers the shift of focus from the interaction between the isolated user and the stand-alone computer to a larger, more ecologically valid interaction context between human beings with their environment; sensitizes us to the dynamic and evolving nature of human-computer

interaction and IS design and evaluation; and highlights the rich, multifaceted, and multidimensional reality of strips of computer-mediated activity in situ... (Spasser 1999: 1137)

Importantly, from the perspective of information behaviour research, he also points to the need, if an activity-theoretical perspective is adopted, of having a time-frame for research that is long enough to understand information users' behaviour and their motivations.

More recently, Spasser has applied an activity-theoretical analysis in a study of the development of content for the Flora of North America digital library, in which activity theory is employed as a middle-range realist theory to initiate, provisionally order, and govern the ongoing conduct of data collection and analysis. (Spasser 2002: 93) He presents activity theory within the broader conceptual framework of social realism (a perspective advocated by Hjørland 1997) and concludes that, analysis in the present work has demonstrated the utility of a realist activity theory conceptual framework for ecologically evaluating the socio-organizational and institutional embeddedness of computer-based information systems, such as digital libraries, and explaining the contextual conditioning of our experience of them. (Spasser 2002: 103)

Hjørland (1997) has drawn attention to activity theory in his book *Information seeking and subject representation: an activity-theoretical approach to information science.* In spite of the sub-title, however, the author actually devotes very little space to an exposition of activity theory and his work is more concerned with subject representation, information retrieval and information searching than with information seeking as generally understood in the ISIC series of conferences. However, he makes the important point that:

Activity theory stresses the development of cognition as a unity of biological development, cultural development, and individual development. It has a strong ecological and functional-historical orientation. It also stresses the activity of the subject and the object orientation of this activity. (Hjørland 1997: 80)

Activity theory also stresses the ecological and social nature of meaning... A person's use of a term may be determined not by his individual usage, but by the usage of some social group to which he semantically defers. Therefore, the content of a person's thoughts are themselves in part a matter of social facts. (Hjørland 1997: 81)

Clearly, both of these points are of significance for the study of information seeking behaviour and Hjørland, since 1997, has published a number of papers in which he indicates the value of activity theory in underpinning his own philosophical position of

'critical realism' and his theoretical framework of 'domain analysis' (e.g., Hjørland & Albrechtsen 1999; Hjørland 2000, 2004).

ACTIVITY, CONSCIOUSNESS, ACTIONS AND OPERATIONS IN INFORMATION SEEKING

Leont'ev's definitions of these terms have clear application in information seeking research and, if applied rigorously, could help in the formulation of theory. Examining again the colliery spoils search, we can see that the motivation, the external request, stimulated the activity of document preparation, and that, to accomplish the goal of producing a 'best practice' document, it was necessary for the team to engage in information seeking actions. The conditions under which they worked enabled them to accomplish some of these actions themselves; thus, they were able to carry out the operations of search the Web of Knowledge databases, other databases accessible online, as well as the World Wide Web, and to search library resources, but the limitations in those conditions (no access to the commercial databases) induced them (or, rather, through the division of labour, one of them) to undertake the further action of seeking the project's assistance in carrying out a further search. The operations of that search were carried out, not by the individual himself, but by the search intermediary. We can note that the search intermediary was part of another activity system, that of the research project in which he was engaged, which had its own motivation and goals.

Analysis of that particular case brings out the rich contextual framework in which it was set and suggests lines of enquiry that a less-rich analysis would not suggest.

CONCLUSION

The most important issue is not whether you notice a mode of seeking information that fits into one of these categories, but that a range of modes exist. Observe how your users approach information, consider what it means, and design to allow them to achieve what they need. This exploration of activity theory has served to show that it can be quite a powerful analytical tools and conceptual framework for enquiry. It should be noted, however, that, in spite of being termed activity theory. It is not a predictive theory, but rather a framework based upon a particular theory of human consciousness, aiming at explaining the character of human behaviour.

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Information Seeking Behaviour of Learner in Open University Libraries: Issues and Challenges

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ABSTRACT

Information Seeking is the process or activity of attempting to obtain information in both human and technological contexts. Information seeking is related to, but yet different from, information retrieval (IR). Many researchers investigated how people with varying degrees of familiarity with information retrieval systems and varying models of the information retrieval process, interacted in an information retrieval system which did not support exact match retrieval with structured queries, but which did support best match ranked output retrieval with unstructured queries and automatic relevance feedback. In this article the authors are working in the Open University system need to seek the opinion of learners learning in Open University system. This article find outs the information seeking behaviour of online learners with the case study of KSOU, Mysore.

Keywords: Information Seeking behaviour, e-environment, open universities,

INTRODUCTION

The present era is the era of information and knowledge revolution. Many electronic resources are available in the library. The increase in information available on the web has affected information seeking behavior. Information is the product of human in action it may be abstractor concrete when an individual being to think about the variety if image and sensations flash across his/her memory retains some piece of knowledge. That piece of knowledge is the information. Information is an important input or basic resources link between varieties of activities intellectual and material in the practice of any subject. Research stimulated often by new information is

sustained by containing flow of information and when yield new information. Girija Kumar has emphasized that the information seeking behavior is mainly concerned with who needs what kind of information and for what reasons, have information is found evaluated and used, and how there needs can be identified and satisfied. According to him the following the process takes place in the information seeking behavior:

- Identifying objectives
- Defining need
- Accessing information system
- Establishing sources of information
- Information Acquisition
- Use of information
- Satisfaction / Dissatisfaction

INFORMATION SEEKING BEHAVIOUR: CONCEPT AND MEANING

According to T.D. Wilsons information seeking behavior is defined as "those activities a person may engage is when identifying his or her own words for information searching for such information is any way, and using or transferring the information". The concepts of information seeking, information retrieval and information behavior are objects of investigation of information science. Within this scientific discipline a variety of studies has been undertaken analyzing the interaction of an individual with information sources in case of a specific information need, task, and context. The research models developed in these studies vary in their level of scope. Wilson (1999) therefore developed a nested model of conceptual areas. There is a different between information seeking and information behavior. Information seeking is a conscious effort to acquire information in response to a need or gap in your knowledge.

Information seeking in Libraries implies information seeking behavior of academics has been a focus of inquiry within the Library and information science community for decades. The major information seeking study characteristics are:

- study small groups via observation or unstructured interviews
- Moved away from studying large groups via questionnaires and structured interviews
- Attempt to generate information seeking models.

This paper presents a study that began with the aim of further extending our understanding of the context of interdisciplinary information seeking and in doing so looked to consolidate and improve on our interpretation of information seeking behavior.

REVIEW OF LITERATURE

Suriya, Sangeeta and Nambi (2004) carried out a research work on information seeking behavior of faculty members from Government Arts College in Cuddalore District. The purpose of their study was to investigate how faculty members seek information from the library. It mentions that most of the respondent 61 visited the library several time a week to meet their information needs. Regarding the type of search made by the respondent the majority of the respondents 91 made their search by subject. Shokeen and Kushik (2002) studied about information seeking behavior of social scientists working in the universities located in Haryana. They reported most of the social scientist visits the library daily. The first preferred method of searching the required information by the social scientists followed by searching through indexing and abstracting periodicals and citations in articles respectively. The social scientists use current journals followed by books. Challener (1999) investigated artists and art historians teaching in five liberal arts colleges and three universities. Results found that they need information for teaching. The participants almost all subscribe to art journals and many read newspapers. They visit libraries frequently, usually more than one library and unlike previous reports, the majorities are willing to ask the librarian for help. A large percentage of both art historians an artists are using computers for teaching. All 27 participants use slides extensively in the classroom, supplemented in most cases by textbooks. Wengart, S. J. and Anderson, J. A. carried out a study on the awareness of the teaching faculty and administrators towards electronic resources at the Utah State University. The questionnaires were distributed to all teaching faculty and administrators (856). The total of 426 responded. The questionnaire contained 55 databases available at the Utah State University. For each database, each responded was asked to check whether he/she was aware of the available database and also asked to rank its easy of use. Only 62% respondents ranked easy to use and 54% accessed the databases from their home of office, remaining from the library.

Jeevan, V. J. K. reported that libraries in India are progressing well in automation and electronic information services. With each advancing technology the time incurred for users to retrieve information has shown a greater reduction than for print sources. He Examine the difficulties of expressing information and the difficulties of information systems to represent properly these needs and retrieve relevant results. Rogers. S. A. examined the level of awareness and frequency of use of electronic resources and printed journals, attitudes towards replacing printed journals, correlation between age and use of electronic resources at Ohio state university in 1998. The three year study conducted annually from 1998 to 2000 at the university showed the increased use of electronic resources journals and decreased use of printed journals by faculty and graduate students.

OBJECTIVE OF THE STUDY

The specific objectives of the study are:

(a) To examine Information Seeking Behavior of faculty, research scholar, Post graduate students.

(b) To determine the bind of information are used by the library users for seeking information.

(c) To understand the purpose for which the faculty and Post graduate students use information resources and services.

(d) To find out the problems faced by these while accessing the electronic resources and services.

(e) To know the existing technological infrastructures of the Karnataka State Open University library.

(f) To know their view regarding the available on-line resources and suggestions for further development in electronic information services.

(g) To suggest the administrator of the library for improving electronic based resources and services at Karnataka State Open University library for better use of electronic resources.

NEED OF THE STUDY

Information is a national resource and it is necessary for national development. As information becomes a necessary resources and commodity in the digital era, providing information services to all types of libraries. In an university libraries, library are faced the challenge of providing better services. The idea of library co-operation resource sharing and networking is infact, some such efforts in the past. But the recent trend is forming library consortia for sharing of electronic resources. The increasing information technology infrastructure, availability of large number of free text online resources like e-journals, e -books and databases, extension of academic and research programmes necessitate to investigate the optimum utilization of these resources by the faculty members, research scholars and post graduate students in the area of arts in Karnataka State Open University.

METHODOLOGY

This survey is based on information seeking behaviour of our Karnataka State Open University Library students as well as the staffs both Teaching as well as Non – Teaching staffs. The questionnaires were distributed to 623 users. In that 451 learners responded to the questionnaire i.e. 72%. The respondents are Lecturers, Readers, Professors, the Non Teaching staffs and the great good number of Students.

Table 1. Details of Questionnaires distributed to the Employees and Students

Sl. No.	Various Categories of Employees & Students	Distributed Questionnaires	%	Response Received	%
1	Lecturer	48	8	41	9
2	Reader	15	2	12	3
3	Professors	08	1	06	1
4	DR/AR	23	4	18	4
5	SUP/FDA/ SDA	248	40	153	34
6	DEO	23	4	18	4
7	Students/ Learners	258	41	203	45
	Total	**623**		**451**	

The collected data were analyzed and tabulated in different columns with calculated percentages. On the basis of date analysis we got more students were responded the questionnaire.

Table 2. Response Received from Faculties

Sl. No.	Faculty	Details regarding the No. of Respondents			
		Distributed Questionnaires	%	Responses Received	%
1	Education	13	24	12	26
2	Humanity and Social Sciences	34	63	28	61
3	Management	03	06	03	06
4	Information Technology	04	07	03	07

The responses are received from different fields of faculties. On the basis of data collected, maximum respondents are from the area of Humanity and Social Sciences. The other area respondents are also responded very well.

Table 3. Method of Information Seeking

Sl. No.	Method	No. of Respondents	%
1	Discussion with Colleagues	212	20
2	Consult a Knowledgeable Person in the field	108	10

3	Consult Supervisor	89	08
4	Discussion with librarian or reference staff of your Library	68	06
5	Discussion with librarian or reference staff of other Library	32	03
6	Review Articles	18	02
7	Abstracting Journals	67	06
8	Indexing Journals	78	07
9	Library Catalogue	184	18
10	Any other	218	20

The question was asked about the method used by the faculty members for seeking information. Table 3 shows that 20% respondents are discuss with colleagues, 18% respondents are consult the library catalogue and 10% were consult the knowledgeable persons.

Table 4. Purpose of Information Seeking

Sl. No.	Purpose	No. of Respondents	%
1	For preparing class lecturers	106	09
2	For updating knowledge	318	30
3	For doing research work	55	05
4	For writing paper and presenting paper	21	02
5	For doing Ph. D	178	16
6	For guiding researchers	12	01
7	For entertainment	84	08
8	If any other	300	30

As shown in the table 4, respondents indicated the purpose of information seeking. 30% of learners sought information for updating their knowledge, 16% learners were for doing their Ph.D and approximately 9% were for preparing class lectures.

Table 5. Types of Information

Sl. No.	Types of Materials	No. of Respondents	%
1	Text book	312	29
2	Periodicals	212	20
3	Newspapers	87	08
4	Exhibition	30	03
5	Government Publications	04	01
6	Reference books	181	17

7	Pamphlets	08	01
8	General books	111	10
9	Patents	02	01
10	Thesis/Research reports	127	10
11	Any other	-	-

Respondents were asked to indicate the type of information sources which they used to seek information. For seeking information textbooks were the popular type of information sources for all the respondents (29%). 20% users use periodicals and 17% were use the reference materials available in the library.

Table 6. Language Used

Sl. No.	Types of Language	No. of Respondents	%
1	Kannada	253	56
2	English	154	34
3	Hindi	27	06
4	Urdu	13	03
5	Any other	04	01

A question was asked to find out the language of reading materials preferred by the respondents. It is cleared from the analysis that 253 (56%) learners use the regional language like Kannada, 154 (34%) respondents use English.

Table 7. Problems faced by Employees and Learners

Sl. No.	Type of Problems	No. of Respondents	%
1	Unaware of updated Information Technology	14	01
2	Materials is not available	122	10
3	Library staff are unwilling for service	74	07
4	Incomplete Information materials	212	20
5	Information sources are no far located	114	17
6	Lack of time	264	24
7	Do not know how to use the catalogue	28	03
8	Lack of knowledge in using the library	69	06
9	Understanding of English language	10	01
10	Information scattered in too many sources	67	06

11	Information is too vast	08	01
12	Some of information materials are old	92	09
13	Any other	-	-

The respondents were asked to mention the problems they faced while seeking information, that the majority of the learners (20%) faced the same common problems the lack of time because most of our respondents are working students. Our university is a distance education so they mainly face the problem of lack time. 20% of respondents faced the incomplete information materials available in the library and 17% response the information sources are so far located.

Table 8. Search Engines

Sl. No.	Search Engines	No. of Respondents	%
1	Google.Com	408	38
2	Yahoo.Com	378	35
3	Sanook.Com	-	-
4	Excite.Com	-	-
5	Hunsa.Com	12	01
6	Kapook.Com	-	-
7	MSN.Com	148	14
8	Alta vista.Com	126	12
9	Lycos.Com	02	01

All the respondents (38%) use search engines, especially google, followed by yahoo (35%) and so on.

Table 9. Use of CD – ROM's

Sl. No.	Use of Various Types of CD – ROM's	No. of Respondents	%
1	ERIC	12	02
2	DAO	28	05
3	ABI/INFORM	10	02
4	AGRICOLA	02	01
5	LISA	83	14
6	NTIS	01	01
7	Ei- Tech Index	-	-
8	Science Citation Index	-	-
9	H.W.Wilson	-	-
10	Any other	437	76

A question was asked about the use of CD-ROM. 83 respondents (14%) mentioned that they use LISA database, where as 28 members use DAO (Dissertation Abstract Online) and so on.

CONCLUSION

The successful usage of any library depends to a large extent on the choice of library collections. The choice of the collection should meet the need and requirements of the end users. At the same time librarians must be aware of how the Open University / distance education users seek information. The first three preferences given by the learners for seeking information are textbooks, periodicals and newspapers. It is also observed that the majority of learners sought information for updating their knowledge and research work. Some of the export reveals that journals appear to be the most popular source for current awareness purpose. Distance education learners used several methods to seek information. But they preferred to discuss with their colleagues. Majority of the users use Kannada regional language for reading materials.

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Information Use and Information Seeking Behaviour

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ABSTRACT

Now, the digital world serves the purpose of latest updates, world wide medical information for all the students and staff round the clock on all days throughout the year. The different types of strategies or methods of action are planned to achieve, satisfy the need for information is known as Information Seeking Behaviour (ISB). Information use and ISB motivate a person to seek information from various sources in this information society. The type of information needed, the accessibility to information, the socio-economic position of the user, competition among users, availability of the latest information, the working conditions and the amount of time available play a vital role in the field of information use and ISB.

INTRODUCTION

Medicine is among many other sciences an area in which the expansion of information is enormous and which is critically dependent on up-to-date information. These factors have influenced the implementation of problem-based learning (PBL) approach in the medical education. Students can't learn during their formal education all what is needed and therefore skills in problem-solving and independent information seeking are emphasized in the PBL-curriculum.

Although interest in information behavior in the context of health care has increased, the main part of it concerns physicians. Medical students' information behavior has been explored in connection of library user or use studies. In the beginning of 1990's Rankin wrote that few library user or use studies have centered on medical students. According to a study conducted in the beginning of 1980's medical students use most often

textbooks and general or overview material to meet their information needs. Results of Mick's study of information behaviour of medical students indicate that the students were dependent on their personal notes and colleagues.

Due to changes in the medical education interest in medical students' information behavior has grown during the last decade.

NEED FOR THE STUDY

A medical student needs information for 3 purposes namely for preparing for examinations, for research and for clinical treatment. Medical professionals need latest information. The growing Knowledge in medicine with the invention of new drugs, new diagnostic techniques and ultra modern treatment. Therefore medical students need latest development of information that is taking place in their fields.

The present investigation of information needs and information seeking behaviour of medical student's faculty working in Government Medical College of Kurnool is carried out in three dimensions: Studying, and getting information, and analyzing for the development of knowledge and research.

OBJECTIVES OF THE STUDY

Study has been conducted with the following objectives:

1. To study the information needs and Information Seeking Behaviour pattern of medical students of KMC, Kurnool.
2. To study the use of the KMC's Library.
3. To examine the motivating factors of Information Seeking Behaviour among the respondents.
4. To study the facilities and services available in Kurnool Medical College's Library, Kurnool, in seeking information.

METHODOLOGY

There are thirty Medical Colleges in Andhra Pradesh. The investigator has limited the study to Kurnool Medical College; Kurnool as the work not been done elsewhere. The investigator designed a questionnaire for data collection.

DATA ANALYSIS

A total of 140 structured questionnaires were distributed among medical students of Government Medical College, Kurnool. Of the 140 questionnaires distributed 112 questionnaires were received. Received

sample questionnaires were analyzed statistically. This forms 80% and is highly convenient.

INFORMATION SEEKING BEHAVIOUR

Information seeking behaviour (ISB) is an activity of an individual in the process of identifying a message that suits his knowledge pursuit. It is synonymously used with information gathering or information seeking pattern. It is an act of searching or finding or locating information need by an individual as a student, as a professional, academician, researcher, consultant etc. The process of searching information through various channels of communication is termed as information seeking behavior. In this study ISB is related to the medical students of Kurnool Medical Colleges, Kurnool, and Andhra Pradesh. How Medical Students seeks information for their studying and research and for clinical management is the focus of this investigation.

Distribution of students based in their visits to the library in KMC, Kurnool

Visits to the Library	No.of respondents	Percent
Every day	37	33.0
Once in a week	15	13.4
More than once in a week	23	20.5
Once in fore night	3	2.7
Once in a month	2	1.8
Occasionally	27	24.1
Never	5	4.5
Total	**112**	**100.0**

This table shows that 33% of the respondents visit the Library everyday 24.1% of the respondents uses the Library Occasionally and 20.5% users more than once in a week.

Distribution of students based on their visits to any library other than departmental library in KMC, Kurnool

Visit to any Library other than Departmental Library	No. of respondents	Percent
Yes	29	25.9
No	83	74.1
Total	**112**	**100.0**

This table clearly reveals that 83% of the respondents will not visit any other library other than their department and institutional library where as 25.9% of the respondents visit the other libraries.

Distribution of students according to required formal documentary information source "Standard Journal Review" in KMC, Kurnool

Information Required/ Sought	No. of respondents	Percent
Never	22	19.6
Rarely	36	32.1
Occasionally	35	31.3
Frequently	17	15.2
Highly	2	1.8
Total	**112**	**100.0**

This table clearly shows that 32.1% of the respondents use standard journal review rarely but on the contrary 31.3% of the respondent use it occasionally and 1.8% of the respondents use it highly.

Distribution of students according to required formal documentary information source "Therapeutic References" in KMC, Kurnool

Information Required/ Sought	No. of respondents	Percent
Never	30	26.8
Rarely	27	24.1
Occasionally	40	35.7
Frequently	9	8.0
Highly	6	5.4
Total	**112**	**100.0**

This table reveals the information sought through therapeutic reference. 35.7% of them use it occasionally and 5.4% of the respondents use it highly.

Distribution of students according to required formal documentary information source "Online Searching" in KMC, Kurnool

Information Required/ Sought	No. of respondents	Percent
Never	14	12.5
Rarely	22	19.6

Occasionally	47	42.0
Frequently	18	16.1
Highly	11	9.8
Total	**112**	**100.0**

This table clears the information sought through Online searching. 42% of the respondents use it occasionally and 9.8% of the respondents use it highly.

Distribution of students according to required formal documentary information source "Internet Sources" in KMC, Kurnool

Information Required/ Sought	**No.of respondents**	**Percent**
Never	14	12.5
Rarely	16	14.3
Occasionally	40	35.7
Frequently	24	21.4
Highly	18	16.1
Total	**112**	**100.0**

This table shows that 35.7% of the respondent use the Internet Sources for information occasionally and 16.1% of the respondents highly and 12.5% of the respondents never use it.

Distribution of students according to required informal non documentary information source "Mass Media" in KMC, Kurnool

Information Required/ Sought	**No. of respondents**	**Percent**
Never	21	18.8
Rarely	27	24.1
Occasionally	38	33.9
Frequently	18	16.1
Highly	8	7.1
Total	**112**	**100.0**

This table reveals that informal non-documentary resource of information on sought through Mass media 33.9% of the respondents use it occasionally and 7.1% of the respondents use it highly.

Distribution of students according to their levels of motivation seeking information "For General Awareness for New Knowledge" in KMC, Kurnool

General awareness for new knowledge	No. of respondents	Percent
No	9	8.0
Weakest	8	7.1
Average	36	32.1
Fairly	41	36.6
Strongest	18	16.1
Total	**112**	**100.0**

This table reveals the level of, information seeking through General awareness for new knowledge. 36.6% of the respondents feel it as fairly good motivation to seek information.

Distribution of students based on use of abstracting and indexing services of 'Library' in KMC, Kurnool

Use of Abstracting and indexing services	No. of respondents	Percent
Marginally	62	55.4
Substantially	36	32.1
Completely	14	12.5
Total	**112**	**100.0**

This table reveals the use of abstracting and indexing services at library, KMC, Kurnool. 55.4% of the respondents use it marginally 32.1% of them substantially and 12.5% of them completely.

Distribution of students based on use of database services of library in KMC, Kurnool

Use of Data base services	No. of respondents	Percent
None	29	25.9
Marginally	42	37.5
Substantially	30	26.8
Completely	11	9.8
Total	**112**	**100.0**

This table shows that use of Database services at library. 37.5% of the respondents use it marginally. 26.8% use substantially 9.8% use completely and 25.9% never use the Database services.

MAJOR FINDINGS

Kurnool Medical College was one of the biggest and renowned Institutions in Andhra Pradesh. The College Library was started in the year 1961. The College and its Library has imparted Medical Education to many and serving the community at the best.

LIBRARY USE

- It is found that majority (33%) use the Library everyday for one reason or the other. The use of Library is clearly effective for their career.
- It is found that 43.8% of the respondents felt that Library usually possess the needed information.
- It is found that 44.6% revealed other reasons and 24.1% showed they did not have enough time and they have very reasonable ideas.

FORMAL DOCUMENTARY SOURCE

- It is found that "ACP Journal Club, Evidence based medicine forerunners of systematic Abstract Journals" are sought occasionally by the Medical Students..
- The formal documentary information source is sought through "Journal Articles". It is found many of the students use it occasionally and rarely (33.9%)
- It is found that 42% of the respondents go for online searching 12.5% never use sources followed by Internet Sources.
- It is found that the information sought with discussion with students considered by majority.

LIBRARY SERVICES

- It is found that the respondents (38.4%) depend substantially on barrow of books and marginally 48.2% depend on library only.
- It is found that more than half of the respondents depend on library for reference services.
- It is found that services like bibliographic services, current awareness service; distribution of selective dissemination of information services. Inter library loan are used marginally by more than 50% of the students.

- It is found that the services like photocopy services, journal / periodical circulation services Abstracting and indexing services are utilized marginally by more 50% of the respondents.
- It is found that 62.5% of the respondents depend on the Informal Sources of Information.
- It is found that 25.9% respondents depend on other types of databases

SUGGESTIONS

Medical Education and research have drastically changed in their concept and character due to advances in bio-medical sciences. These changes demand support from their respective libraries to collect, sort and recall the wide variety of information.

- It is suggested that the library should subscribe be important medical science data bases and should be a part of medical library consortium.
- It is suggested that the library should create an Institutional Repository and a digital library.
- Use of library services:- To promote the awareness of internet services, the librarians should conduct user education programme for promotion of the availability of various library services and resources.
- It is suggested that user studies should be conduct periodically to find out the extent of non-utilization of library services.
- It is suggested that medical college libraries which information resource and dissemination centers should become a platform for informal information exchange also thus the library should be renamed as "Information Resource Centre".
- The Library of the Medical Colleges should be connected with a common NET as suggested by many of the researchers to make possible the quick processing or all the Medical Databases. A network consortium will be successful so long as each participating library finds it beneficial to it.
- All the Medical College Librarians should be given training and upgrade their talents to reach to the level of saturation and they should be in a position to dual with all the faculty and students with the required information sources for a prospering healthy nation.

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Use of Faceted Classification for Information Retrieval in a Digital Library

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ABSTRACT

Full text search of digital content enhances the recall but gives 'false positives also. This paper describes the effectiveness of controlled vocabulary tools in the information retrieval process, when combined with the full text searching mechanism. As a case study 'Digital Library of Defence Science Journal' developed using Greenstone Digital Library Software was taken into account. We developed and implemented a model for facet analysis based on Ranganathan's theory of facet analysis to enhance the precision in the search results.

INRODUCTION

In the present scenario, the process of full text searching predominates retrieval process. Popular web search engines such as 'Google' and other information retrieval tools provides thousands of articles just with a click of mouse. It allows flexibility, and ease of operation and access to abundance of information. After all, how much time it takes to click a mouse on a keyword of user's choice. But can we rely on these search engines to retrieve pertinent information? Are we sure that we are not missing some relevant articles in abundance of this information. Do we have time to sift through thousands of articles which satisfy our requirement. In case of file formats which represent audio, video, software and other kind of multimedia files, does this kind of search engines fully serve the purpose. Are the metadata elements such as Author, Title, Source and date of publication, contributor, subject terms etc. used to describe a document are sufficient to retrieve the desired information, when required.

An attempt has been made in this paper to address these issues. The solution lies in well tested library science methods of content analysis and its representation combined with full text searching.

As a case study we have taken into consideration 'Digital Library of 'Defence Science Journal' created at DESIDOC using Greenstone Digital Library Software. The articles published in 'Defence Science Journal' cover research and development work of the scientists and researchers working in the area of DRDO related projects. The content of the journal was highly specific in nature and required special consideration for effective retrieval. The metadata elements such as Author, Title, Source etc. combined with full text searching were not found to be sufficient to derive the precise results.

We implemented the facet analysis and subject classification method to improve the precision in the retrieval. Keeping in view the specificity and exhaustivity of the content of digital library we derived and implemented a model of facet analysis. This paper attempts to draw attention towards these Library Science methods in handling the digital content when combined with other metadata elements and full text search of information.

FULL TEXT SEARCH : ISSUES AND CONCERNS

The issues which need to be addressed and analyzed in detail by the information professionals to arrive at a workable solution are given below. These points are illustrated by taking few examples

1. Full Text Searching though it offers high recall--suffers from low precision, which is to say that it tends to retrieve a large number of irrelevant articles. For example, a scientist is interested in 'AN SPY 1A' radar system. Where 'AN' stands for 'Army Navy' radar systems and the term is commonly used as a technical jargon to identify electronic/ military equipment with a radar system. A full text search in a database or on internet will retrieve either irrelevant results or if AN is used as a stop word, it will not retrieve any result which contains both the terms. These kinds of .irrelevant search results are frustrating, especially to the users who wants specific output relevant to their query.

   This kind of low precision and high recall offered by full text keyword searching creates a kind of illusion in the mind of the user where not many documents are relevant to the users needs.

2. If a user wants to enhance the precision by combining all possible terms in the query using Boolean logic, he may retrieve the relevant results but miss certain relevant documents which

use synonyms or homonyms. In the above example if the user searches by the keyword Army*Navy*radar*system. The articles containing the term 'defense' or 'defence' or 'military' with the term 'radar' system will be missed by the system.

3. Worst is the case when user is not able to retrieve the documents on which he is searching the information. For example an article search on 'fire control system' and fighter aircraft' reveals the output as gun fire in a fighter aircraft whereas the user desires to find article on the how to extinguish the fire in case of emergency. In this case user is lost in the process of retrieval of information..

Therefore, full-text keyword searching may give to some extent a global view of information available in a subject area, but it also tend to give 'false positives' and is rather a relatively primitive method of mapping the relevant information.

Therefore one needs to develop and implement well defined systems which maps search terms to their synonyms, distinguishes the search terms from semantically-unrelated homonyms, and suggests links to related documents that do not contain the search terms.

METADATA ELEMENTS : EFFECTIVENESS IN INFORMATION RETRIEVAL

In Dublin Core metadata element set of 15 elements, there are three metadata elements such as Title, Description and Subject field, which tries to describe, what the document is about.

The metadata element 'Title' may include few keywords describing the subject covered in the document, but it may not necessarily give scope of the document completely. Sometimes it may lead us to false or confusing terms which may not have any link with the content of the documents.

The metadata element 'Description' is used to designate a textual description of the content of the resource e.g. 'Table of Content' or 'Abstract'. This may also not be sufficient in some cases to define the subject content in absolute terms. It also suffers from the same problems as described above.

In the metadata element 'Subject' is used to describe the content of the resource. We may use keywords or phrases that describe the subject or content of the resource, Though it allows us to describe the extensive set of keywords considering the relative concepts, synonyms, homonyms etc. but this may also lead us to 'false positives' if the keyword just gives a relative reference.

Therefore, in the cases described above, if we know the exact terms describing the main concept of the document, it is possible to retrieve the document of our choice. But if the term chosen by the user does not describe the main concept of the document, the search results obtained may not fulfill the user's needs. Therefore, if we approach the document with a keyword approach, a user may or may not be able to retrieve the desired results, even if it exists in the database.

The solutions lies in identifying the 'Principal Concepts' of the documents and to bring uniformity in the retrieval process, converting them into standardized terms using controlled vocabulary.

Keeping in view the above factors, we thought of using the SR Ranganathan facet analysis for 'Principal Concept' identification.

FACET ANALYSIS FOR CONCEPT IDENTIFICATION

In Wikipedia the definition of 'Facet' is given as;

A **facet** comprises "clearly defined, mutually exclusive, and collectively exhaustive aspects, properties or characteristics of a class or specific subject".

A faceted system recognizes that any given subject has many aspects, and tries to synthesize these aspects in a way that best describes the subject. This enables a disciplined approach in concept identification for description of subject content of the document.

We performed following three steps for facet analysis and concept identification

1. Examine the article and establish its subject content
2. Identify the principal concept in the subject content
3. Translation of selected concepts into standardised terms.

Examination of document is the preliminary stage of indexing, where the information professional has to analyze and identify the facets which describe the subject content of the document. A methodology need to be defined to identify these facets in a consistent manner, which also helps to identify the principal concept in the document.

S.R. Ranganathan in his model, proposed a universe of discourse, called 'Basic Subject'. With each basic subject, several entities, their properties, and actions can be studied in relation to space and time.

Based on this analysis, he identified a scheme for classification. He postulated categories that gave generalized abstractions. In each instance, a subject may have the presence of one or more of these categories.

Therefore a classified faceted systems can accommodate new knowledge in more flexible and dynamic way.

In Wikipedia the faceted classification is described as

A **faceted classification** system allows the assignment of multiple classifications to an object, enabling the classifications to be ordered in multiple ways, rather than in a single, pre-determined, taxonomic order.

On the basis of these postulates, we performed an analysis of the collection of documents under consideration.

1. The subject area under consideration was highly specific. There was need to derive the precise concepts from the documents as well as accommodate new terms, which found its occurrence in the literature quite frequently.
2. We also wanted to bring a consistent approach in the concept identification method irrespective of whosoever is performing the indexing.

Therefore on the basis of Ranganathan's model of facet analysis, we derived following criteria for facet analysis.

Criteria for Facet Analysis	
1.	Basic Subject : Nucleus of Study
2.	Object of Study : The core entity around which the study is entered in the subject
3.	Qualifier to the Object of Study
4.	Purpose of Study
5.	Properties of the Object of Study
6.	Action Performed on the Object of Study
8.	Methodology/ Techniques for performing Action
9.	Instruments used in Performing Action
10.	Space
11.	Time

The 'Principal concepts' derived from the documents using the above criteria were standardised using Controlled vocabulary 'Thesaurus of Scientific, Technical and Engineering Terms' and INSPEC Thesaurus. These terms were entered in the metadata element 'Subject'. On the basis of above criteria, we were also able to identify and describe the new terms, which do not find occurrence in the controlled vocabularies mentioned above. These terms were also incorporated in the metadata element 'Subject'.

The Basic Subject: Nucleus of Study was identified and classified using UDC and entered in the metadata element Subject : Classification

Faceted classification when used in faceted search systems enables a user to navigate information along multiple paths corresponding to different orderings of the facets. This is in contrast with the traditional taxonomies in which the hierarchy of categories is fixed and unchanging. This feature has an advantage in a digital environment where it is possible to hyperlink all the relevant documents by using different resource locators. It is possible to use the same feature in directing the user from inappropriate subject headings toward the relevant subject headings. We used this feature with faceted classification to help the user in deriving the query for information retrieval. A Single level faceted classification was implemented in the project discussed below.

DIGITAL LIBRARY OF DEFENCE SCIENCE JOURNAL : A CASE STUDY

Defence Science Journal, a scholarly publication of DRDO publishes the result of the basic research and applications derived by the scientists of DRDO as well as from other prestigious R & D organizations. This journal is published by Defence Scientific Information and Documentation Centre (DESIDOC), from 1948 onwards. It is a quarterly publication.

We created a 'Digital Library of Defence Science Journal' publication which is a collection of digitized documents of the articles published in 'Defence Science Journal' from the year 1948 onwards. The articles are contributed by the DRDO scientists as well as the researchers and academicians from other scientific and technical organizations and academic institutes. This collection is build up using Greenstone Digital Library Software (GSDL) .

GREENSTONE DIGITAL LIBRARY SOFTWARE (GSDL)

Greenstone Digital Library Software (GSDL) is a versatile open source multilingual digital library environment which has a user base hailing from over 70 countries, is downloaded 4,500 times a month, runs on all popular operating systems. GSDL software allows you to define the database using Dublin Core metadata set. It is a set of 15 properties applied to the information resources for their description.

- Metadata : It is generally assumed that it describes the content of a document for retrieval purpose. It consists of discrete piece of information. These discrete pieces of information are called metadata. The metadata element set gives us tremendous flexibility in representing the elements for retrieval of information.

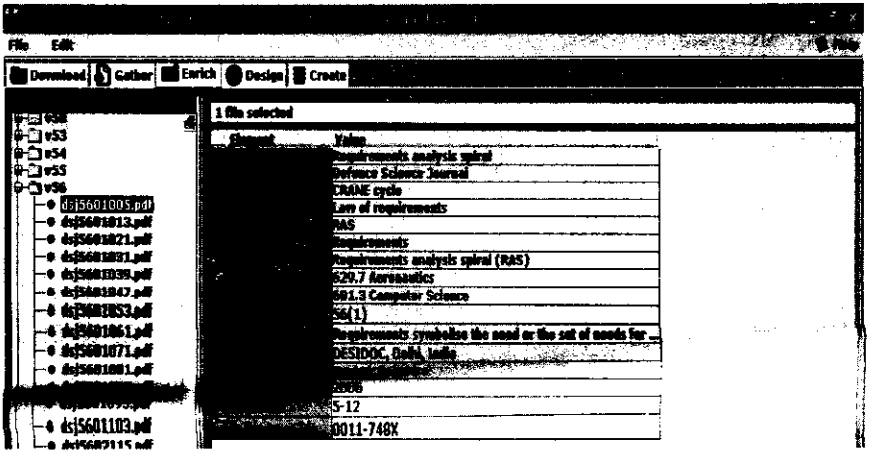
FEATURE OF GSDL

Searching in GSDL is full-text. A user can select and build indexes based on metadata or 'full text' of the document. While searching the information user can browse the indexes such as sorted list of authors, titles, dates; hierarchical classifications; and so on. Structures for both searching and browsing are specified by the users in the configuration file. These indexes can be rebuild automatically. Collections containing millions of documents, and up to several gigabytes, have been built using GSDL. Searching mechanism is flexible and fast, choosing between the indexes or the 'full. Compression is used to reduce the size of the indexes and text. It requires zero maintenance in terms of updation of database and there is no need to bring down the system for maintenance and updation. New documents in the same format can be merged into the collection automatically. No links need be inserted by hand, but existing hypertext links in the original documents, leading both within and outside the collection, are preserved. All structures are built directly from the documents themselves.

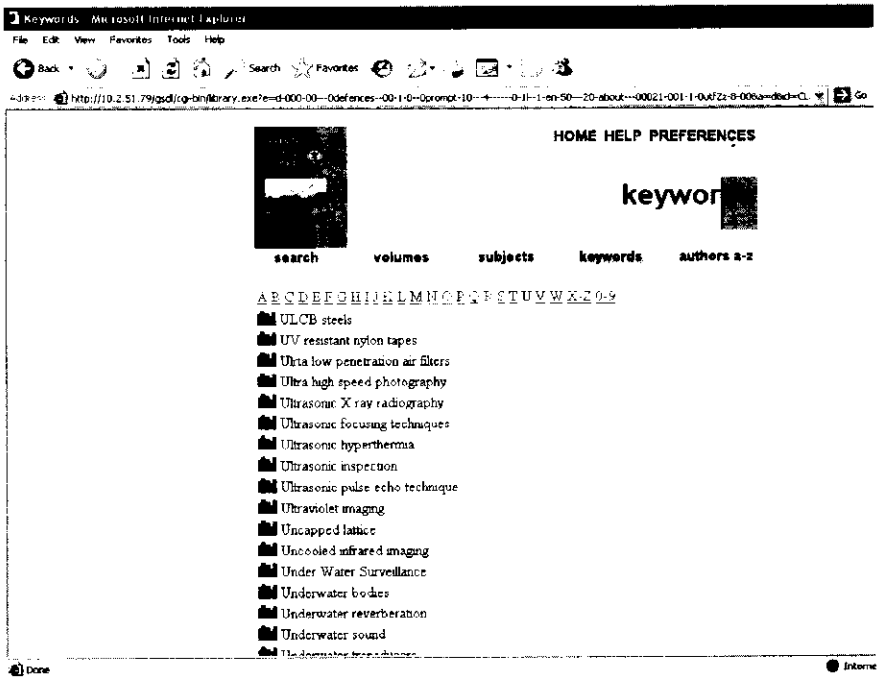
RETRIEVAL BASED ON 'PRINCIPAL CONCEPTS '

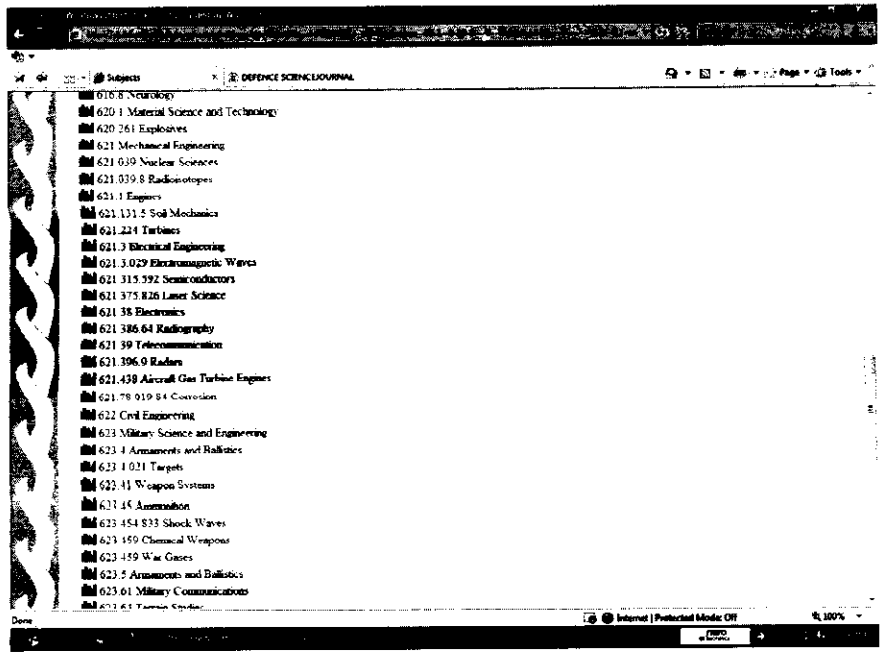
Many a times the metadata element set, as described above one are sufficient to retrieve the desired article. In case, the user is not aware of these elements and search the database with keywords. The keywords in the 'Title' and 'Full Text' provides the results if the terms occurs in the database. The search results retrieved may be random in nature for the reasons as described in the above sections To overcome this issue, we defined two metadata elements 'Subject' describing keywords and 'Subject Classification' for concept identification, its representation and retrieval.

The metadata elements selected to describe the content of the articles as shown below.



We also generated indexes on the subject headings and class numbers alongwith other indexes to enable users to view the content of digtal library and access the documents using GSDL software. This feature guided the users towards those keywords and subject headings which might contain the information of their interest.





This structured knowledge base provided us a network of semantics. If we formulate a search pattern with the help of this index, i.e. if we form a search pattern into a concept, the classification will discover other concepts also that the search query matches.

For example When we searched the database of 'Defence Science Journal' for information on 'Design of Fighter Aircraft'. The keywords formulated were

Fighter aircraft (KW) * Design(KW)

We were able to retrieve those records in which keyword 'Design' occurred explicitly. Another observation was that the keyword 'design' may occur in any context as it is a general term. However, from the query results or from the users experience, we used the 'subject classification' and formulated the query as

Fighter Aircraft (KW) * Aeronautics(SC)

The use of Subject Classification in query helped in enhancing the precision as well as the recall

Another factor is that while performing the search alongwith the Subject Classification, the user always know where they are exactly in the classification scheme. They can move through the classification scheme to narrow down or broaden their search criteria, as all the concepts are hyperlinked.

When searches were performed with standard concepts alongwith a combination of free text searching as provided in GSDL, the recall is enhanced but within the main concept defined in the index

CONCLUSION:

The application of 'facet analysis' combined with 'subject classification' provided a dynamic system in the information retrieval process for the Digital Library of Defence Science. In a networked environment, retrieval based on concepts can greatly enhance the precision thereby saving the time of the user provided the concepts are defined in a uniform manner. It also provides you with a scope to define new concepts, making your system more dynamic in a retrieval process.

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Application of Information & Communication Technologies in Engineering College Libraries:
A study of Engineering College Libraries in Faridabad District, Haryana, India

Helaluddin
Research Scholar

ABSTRACT

The paper describes the current position of libraries in ICT environment in Faridabad district of Haryana state. Various services provided by libraries with support of Information & Communication Technologies to their users have been observed and discussed with the library professionals and their users. It also evaluates the users' attitudes, awareness and satisfaction about the library services is being provided with support of ICT. The data collected with the help of questionnaire have been interpreted and output results have given in this paper.

INTRODUCTION

Since the invention of the computer by Charles Babbage (1791-1871) in 1837, major information centres have tried to make use of this technology. In Indian context this technology was first used by Indian Statistical Institute (ISI) Calcutta in 1957. Till then as its various generations emerged, the extensive use of this technology had been made in every aspect of our life. Now at the present age every intellectual human being has come into the clutch of this technology. Today the internet is providing access to an endless collection of information resources available world wide.

In India the information and communication technologies (computer technology) have boomed in the field of library and information/ documentation centres in 1990s. Now use of information technology in library and information centres has becomes common. Computer technology is the most popular and widely used technology in library and information centres. Computers are used for collection, organisation, storage, analysis and dissemination of information.

Information Communication and Technology shortly known as ICT is not a single technology only, it is the complete system of technologies.

Time to time this term has been defined by many scholars, learners and learned societies in different ways, but literary meanings of comprised terms are giving more appropriate and authentic idea about ICT. It is comprises with two strong technologies, one is information technology which usually deals with the hardware and software elements that allow us to access, store, organize, and manipulate the information by electronic means. The second is communication technology, which deals with the equipment, infrastructure and software through which information can be received, accessed and disseminates, for example phones, faxes, modems, networks, etc.

In 1990s there were also boomed year of engineering institutions in India. There were 1346 engineering institutions till 2004 with an intake of 439689 students. In 2004-05 total engineering institution grown to 1355, admitted 4.6 lakh students. Up to 2006-07 the total number of engineering institutions have increased to 1503, with an intake of 5,83,333. The entire India has been divided into 8 zones. Northern India comes under the zones of North and North West zone. The North Zone covers Bihar, Uttar Pradesh, and Uttaranchal states. In Bihar there were 8 engineering colleges in 2004 with an intake of 1905 students. The Uttar Pradesh has 89 engineering colleges in 2004 with an intake of 28953 students. Uttaranchal has 9 engineering institutions enrolling every year 1440 students. The North West Zone which covers 7 states, and has 153 engineering colleges, with an annual intake of 50645 students. The Haryana state was having 38 engineering colleges with an intake of 12785 students in 2004. In 2006-7 the number of colleges goes up to 46 in Haryana, and enrolments of 17518 students. In Faridabad district there was only one engineering college from 1969 to 1997 with an intake of 444 students. In the year 1997 two new engineering institutions were established. From 1998 to 2009 there were increases of 14 new engineering institutions. Total intake from 444 students goes to 2772 in 2005-6, and up to 2009 it further increased more than 5000 seats.[1]

Discipline wise Growth in Sanctioned Intake in India:[2]

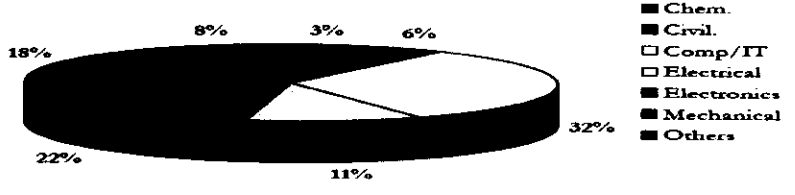


Fig. No.1

India awarded about 2.37 lakh engineering degrees, 20,000 engineering masters degrees and 1000 engineering PhD's in 2006 (a total of 2.58 lakh engineering degrees of all types). India has about 1500 engineering institutions with about 67,000 faculties. India's growth rates for engineering degrees are higher than the other countries. China has high growth rates for the PhD degrees. India's doctorate degrees are less than 1% of its graduate degrees. This is significantly higher for all the other countries.

Share of engineering colleges based on intake:[3]

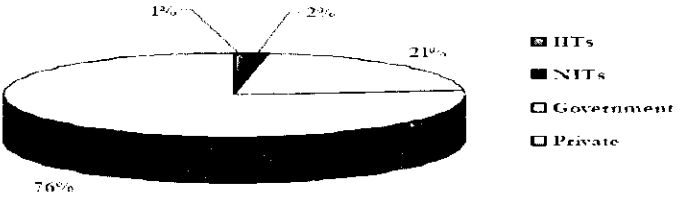


Fig. No.2

Only 24% of engineering educations in India are provided by the government. Private institutions are shares majority by 76% of total engineering education.

Number of engineering libraries in India:

Numbers of libraries are same as the number of institutions. As per AICTE norms there must be a minimum 6 library professionals. So we can say that more than one lakh library professionals are engaged with the engineering institutions. Private engineering colleges are generating 76% employment of library professionals with compares to government engineering colleges are 24% only.

All India shares of engineering colleges libraries of Haryana:[4]

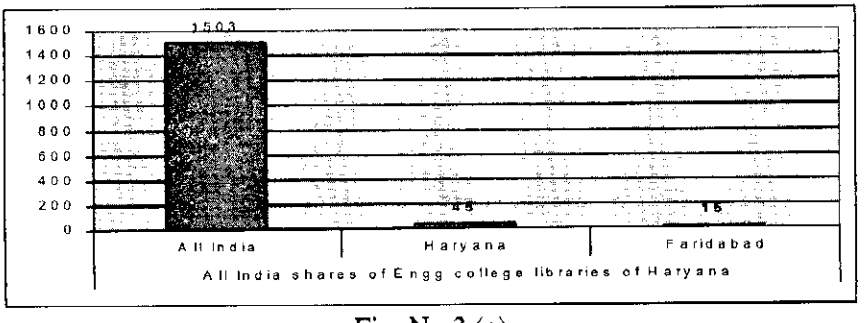


Fig. No.3 (a)

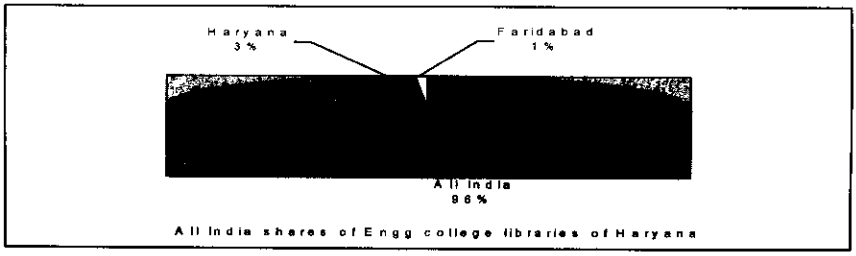


Fig. No.3 (b)

Haryana shares very little ration of all India based engineering institutions. The above figure number-3 (a, & b) shows that Haryana has only 3% of total engineering institutions of India. When we come further narrow, founds that Faridabad district have only 1% of all India engineering colleges.

Faridabad is one of the famous and rich district of Haryana. The district has its boundary with national capital Delhi. The reason behind is the number of rapidly growing engineering institutions taking place. It was the year 1997 when Haryana government opened it technical education policy for private operators. Before 1997 there was only one famous college at Faridabad, named YMCA established in 1969.

NEED OF THE STUDY

There have already been done many studies on the ICT applications in academic libraries in India. In Faridabad district no work has been done yet, as majority of the engineering colleges are established after 1997. Before 1997 there was only one engineering college at Faridabad district, in Haryana state. The investigator wants to find out the various problems faced by the users of Engineering College libraries in ICT environment. And also the problems faced by the library professionals to give their services to the users of the library with the help of the ICT. The study will be the mile stone and a foundation for further researcher.

AIMS AND OBJECTIVES

The main objective of the study includes:

1. to identify level of IT based facilities available
2. to identify IT based services
3. to identify IT based resources
4. to identify user level satisfaction
5. to identify problem faced by users.
6. to identify various problems faced by libraries

METHODOLOGY

Survey method is the best way to know the present situation. Hence a survey was conducted with the help of questionnaires designed for this purpose. Three types of questionnaires was designed, one for users, which are students of engineering of various fields (e.g. Electronics, Mechanical, Computers, Information Technology, etc.) Second for library professionals (library staff), and third based for interview/ observation method for librarians. The majority of questionnaire was of multiple-choice nature to tick appropriate answer. Such questionnaires enhance the response, as they are easy to fill-in, consume less time, and also facilitate efficient, objective and easy analysis of data, tabulation and scoring. In addition, in certain cases, interviews with the heads of libraries were conducted personally to collect the data.

DATA ANALYSIS

400 questionnaires were distributed among the colleges of Faridabad. The response rate was 81.25%. It was a good response suitable for a healthy result. Due to lack of space, total result of the study is not possible to publish here. Therefore some selected data is being revealed here. Some areas covered in the questionnaire are shown in the charts as;

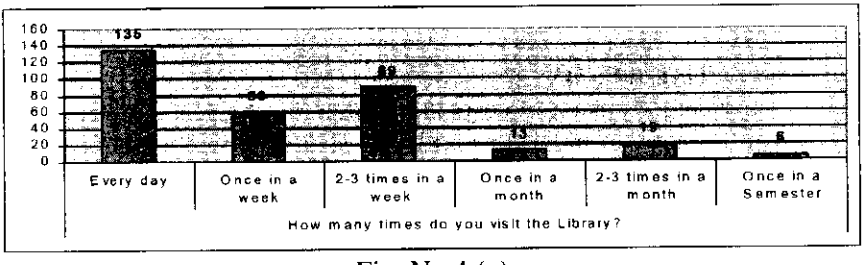


Fig. No.4 (a)

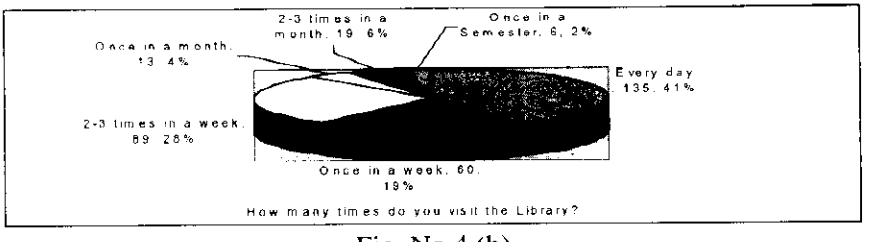


Fig. No.4 (b)

It has been reveled by figure No.4 (a, & b) that 41% respondents use library services daily. 28% visits library frequently as 2 to 3 times in a week. Third response got 19% of library resources use once in a week.

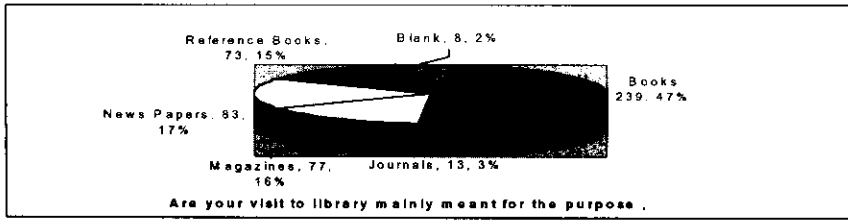


Fig. No.5

Respondents are much depends on library books. The figure number 5 shows that majority of the students as 47% are mainly use the library for books, 17% news papers, 16% magazines, 15% reference book, and journals used by 3% only.

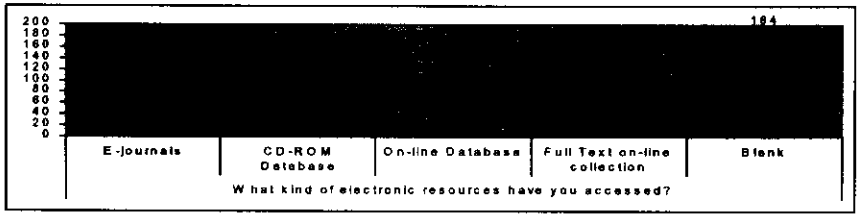


Figure No.-6 (a)

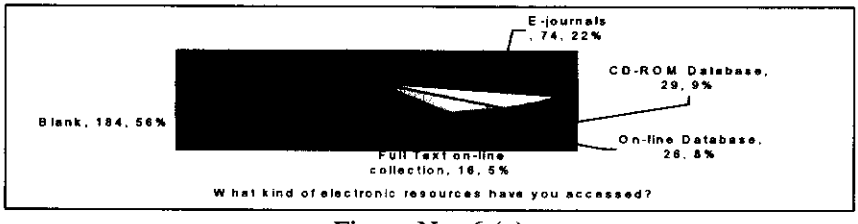


Figure No.-6 (a)

As figure no-6 (a, & b) shows, the ICT based library services are not much used, because students are aimed to their syllabus. The following chart shows that majority of this question 56% left blank. Amongst electronic resources access of e-journals got priority by 74 (22%) students. 2nd place goes to CD-ROM database by 9% students, and on-line database by 8% respondents. Full text on-line data access is very little by 5% respondents.

Figure number 7 represents the electronic data resources based CDs used by 31% respondents. Majority of respondents as 63% do not get issued CDs. 6% not answered this question.

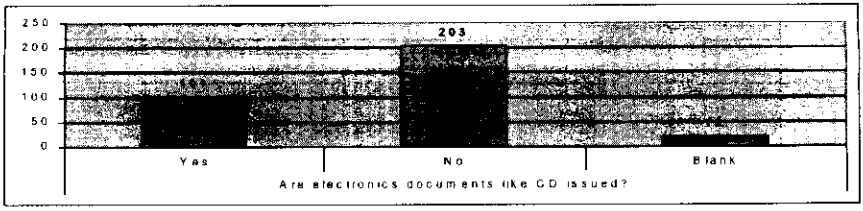


Figure No.-7 (a)

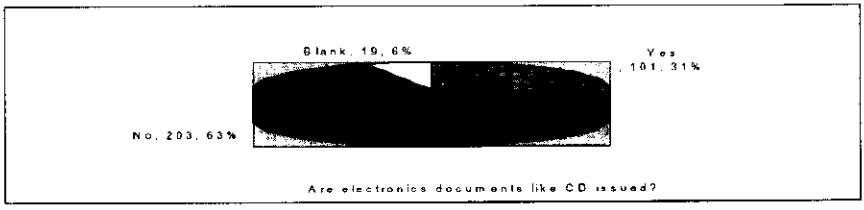


Figure No.-7 (b)

Every library observed is automated. When they questioned about library automation, their response was very interesting. That shows they are much conscious about their time.

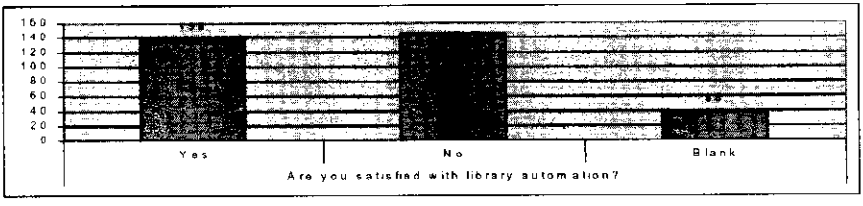


Figure No.-8 (a)

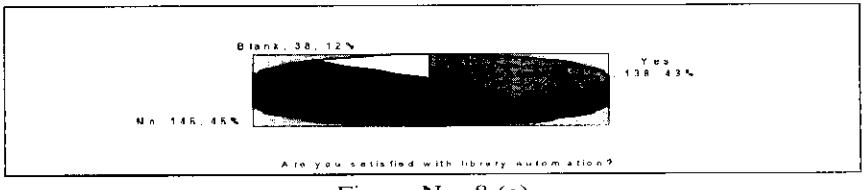


Figure No.-8 (a)

Ranganathan's 4th law of library science is much followed. 'Save the time of the user & library staff' in figure number 8 (a, b, & C). Majority of the students 45% are not satisfied with library automation. The satisfactory ratio is 43%. While 12% were not responded. When they were cross examined, they reveled that due to single issue counter there are always a queue. They demanded more computers be installed at circulation desk for user's services. Their responses are as under;

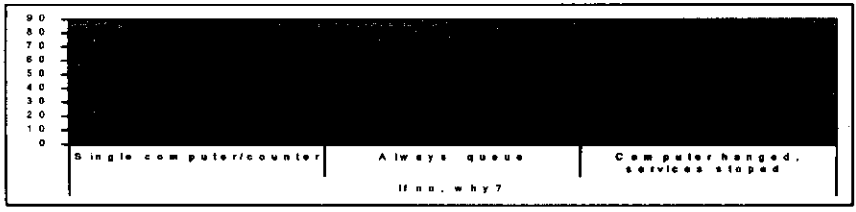


Figure No.-8 (c)

Internet is the most useful & commonly used technology in the world. Students are well versed & using it frequently. Figure number 9 reveled that 68% said their library is connected with Internet. 30% respondents said that their library is not connected with Internet. Remaining 2% have not answered. The following chart shows the responding.

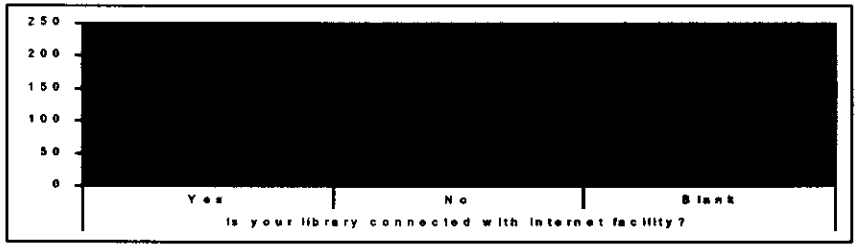


Figure No.-9 (a)

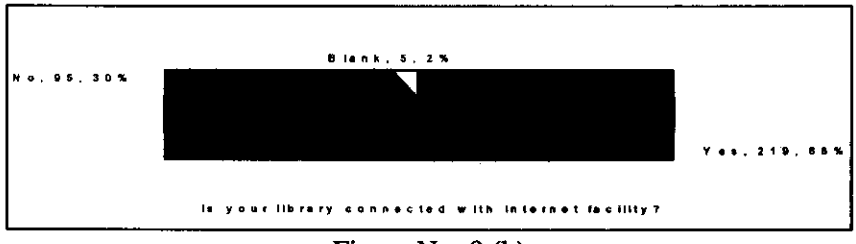


Figure No.-9 (b)

Users are much eager for the Internet access. Few PCs are installed in their library. They need more PCs to be installed to avoid rush for Internet access. The data shows that 55% users are not satisfied with number of terminals. 31% respondents are satisfied.

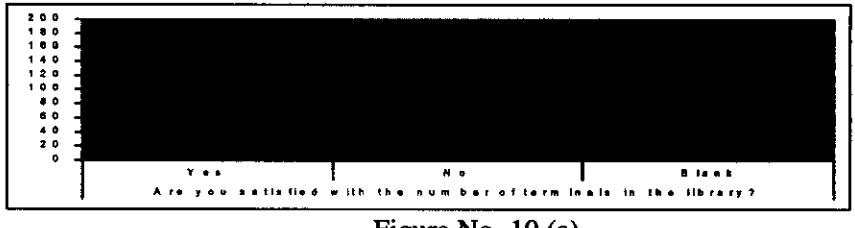


Figure No.-10 (a)

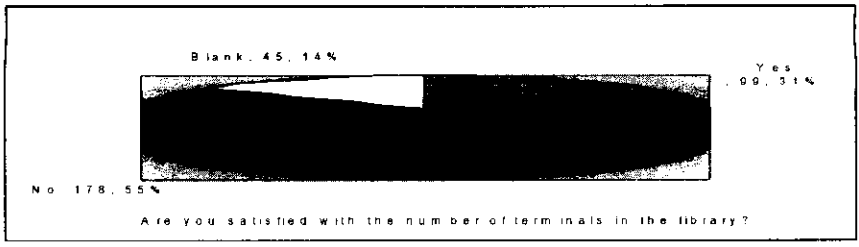


Figure No.-10 (b)

Figure number 11 shows that majority of respondents are using Internet services from the library. 55% accessing Internet services from the library, and 39% browsing this services from out side. 6% have not responded. Details are represented with the help of chart as given below.

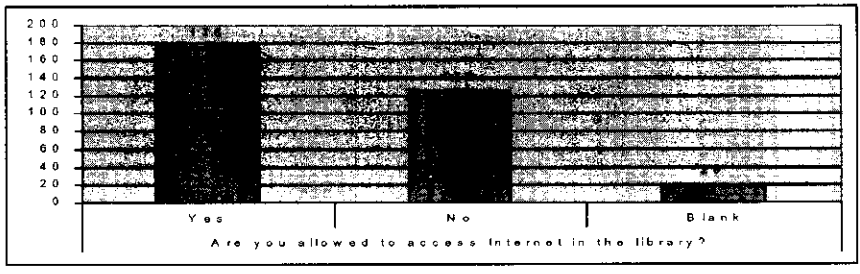


Figure No.-11 (a)

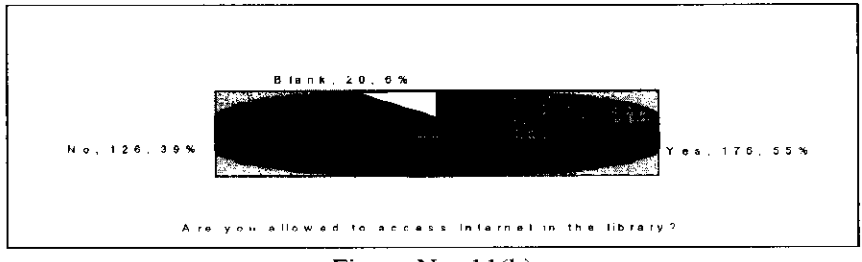


Figure No.-11(b)

Frequencies of Internet use are shown in the following chart (in figure no.12).

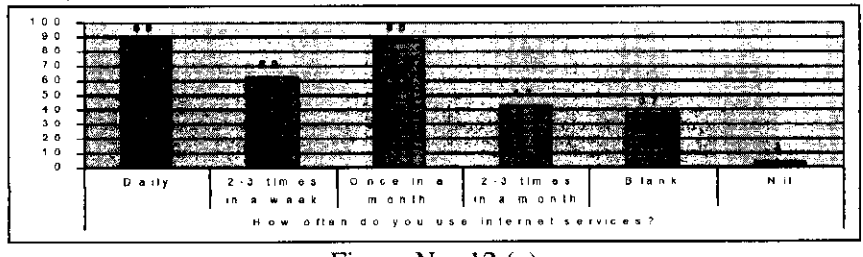


Figure No.-12 (a)

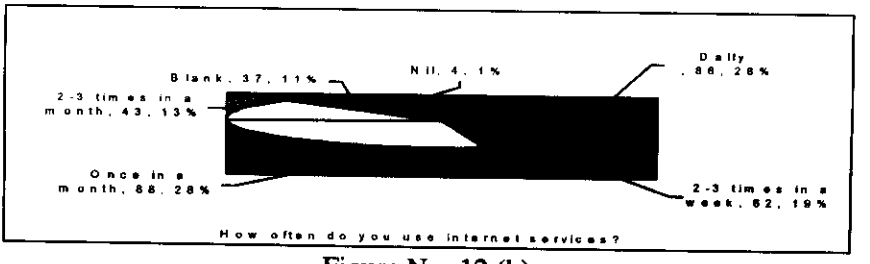


Figure No.-12 (b)

28% respondents are browsing Internet daily, and the same number of 28% are accessing once in a month. 19% are using 2, 3 times in a week. 13% are using 2, 3 times in a month. 11% left the question blank, and only 1% are not using at all.

For which purpose they are browsing Internet? The figure number 13 revealed that

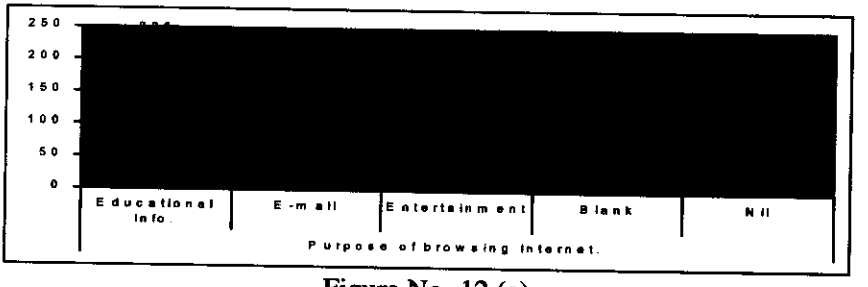


Figure No.-12 (a)

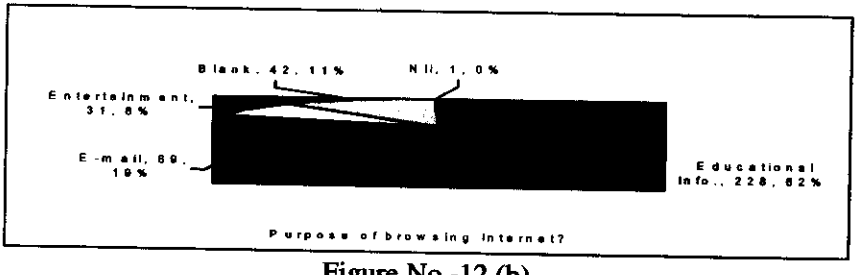


Figure No.-12 (b)

they are utilizing the Internet services for their education purpose. 62% using Internet for educational purpose, 19% for e-mail service, 8% for entertainments.

Users are not satisfied with library Internet services. 58% are not satisfied, 35% are satisfied, and 7% not responded.

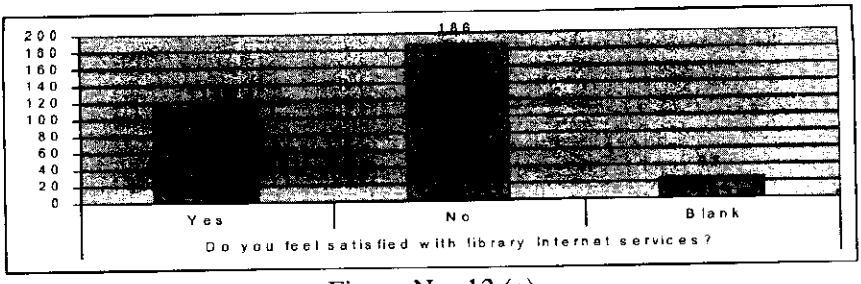


Figure No.-13 (a)

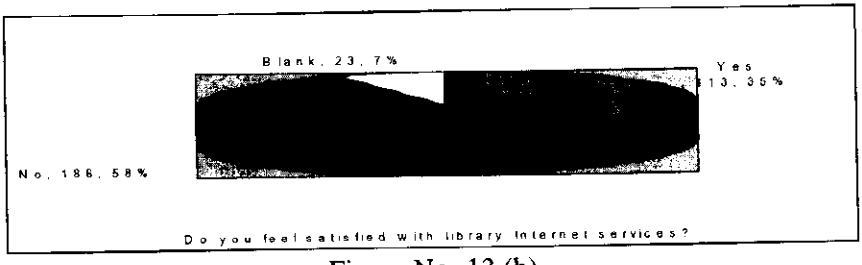


Figure No.-13 (b)

When asked the reason behind dissatisfaction, reasons among them are 55% slow Internet speed, 24% less number of PCs, and 21% said there is no facility. See the figure No. 14.

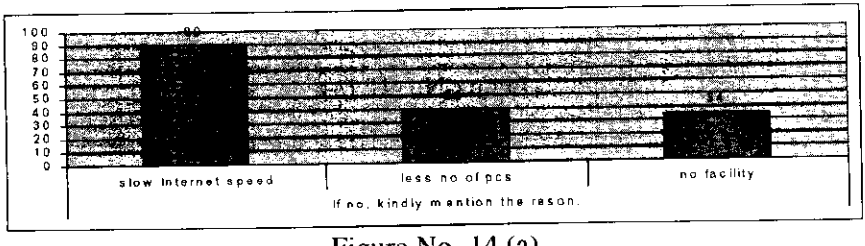


Figure No.-14 (a)

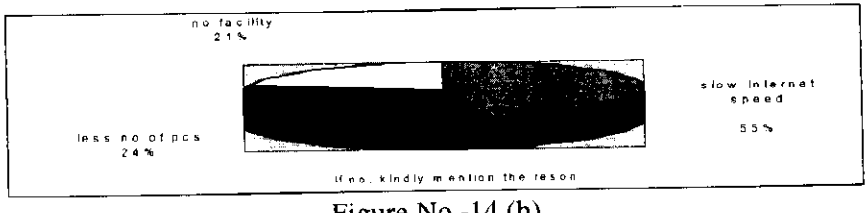


Figure No.-14 (b)

Figure No. 15 (a, b, & c) represent the data of reprographic services. When they were asked for reprographic services, the majority of the students are not satisfied.

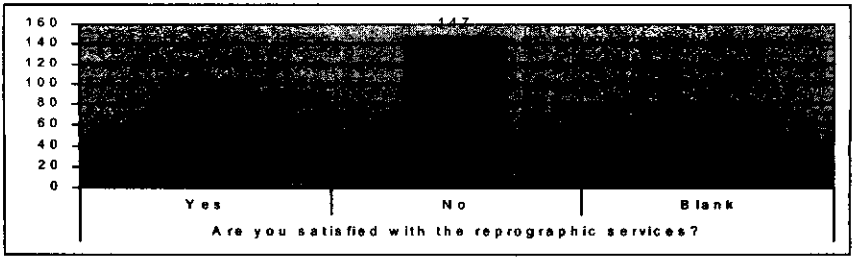


Figure No.-15 (a)

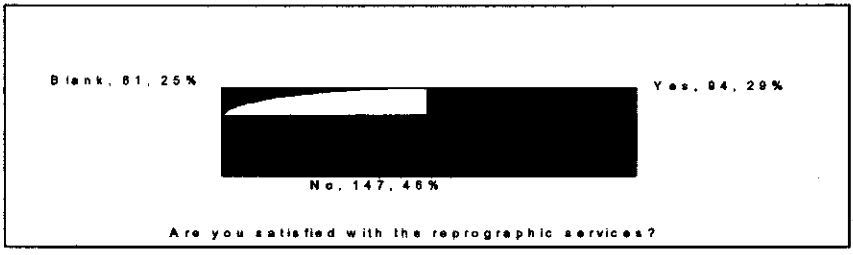


Figure No.-15 (b)

29% of respondents are satisfied, and a big ratio of 46% is not satisfied. The reason is less Xeroxing machines and long queue. 53% have problem with less number of machines, 31% long queue, and 16% want subsidized rate.

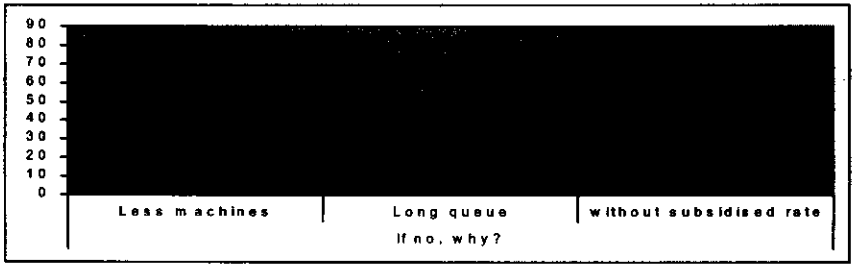


Figure No.-15(c)

Figure No.16 represents the cooperation/ attitude/ manners of library professionals got an average response. Average

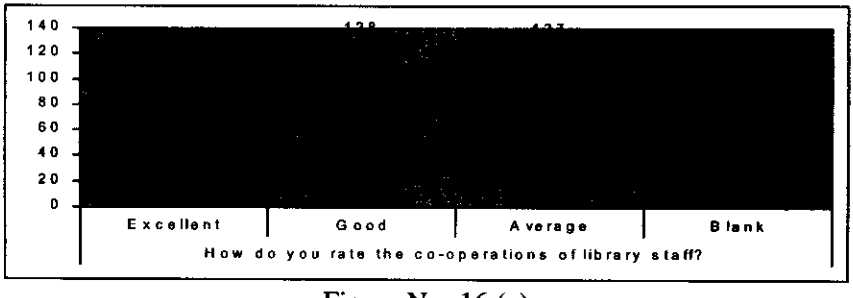


Figure No.-16 (a)

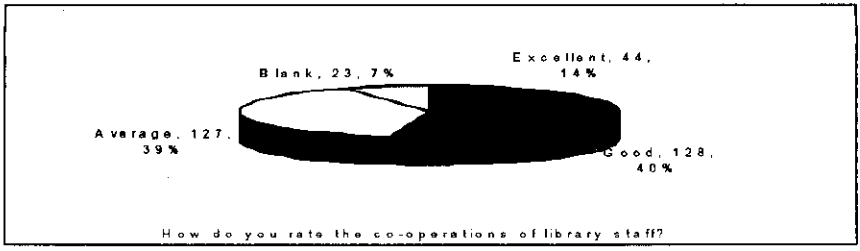


Figure No.-16 (b)

means here is not so good, but so so. There is a strong need of reforms at the stage of training schools. Graph of Excellency must be gone up & up. 40% respondents rated library professionals' cooperation as good. 39% rated as an average, 14% given excellent. 7% did not answer.

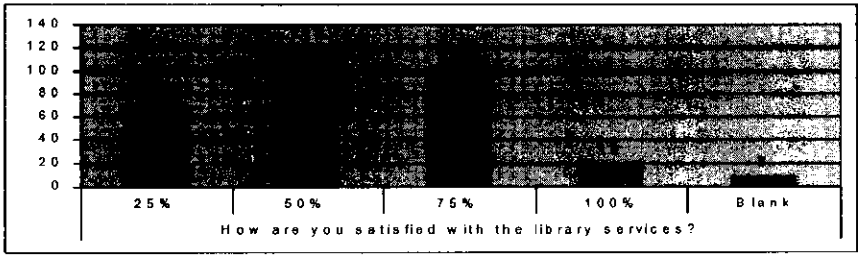


Figure No.-17 (a)

In figure number 17 respondents have not given satisfactory marks to library services. They were asked to give marks from 100 numbers. Four options were given in the questionnaire. The options were 25/100, 50/100, 75/100, and 100/100.

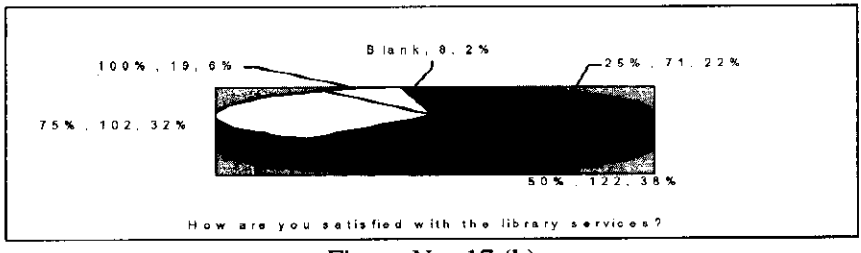


Figure No.-17 (b)

25% marks given by 22% respondents. 50% marks given by 38% respondents, 75% marks given by 32% respondents, and 100% marks given by 6%, while 2% did not answered.

Fig. No. 18 represents the suggestions. 67% of the total respondents have given suggestions to improve library services. 27% maintained silence by not giving suggestions.

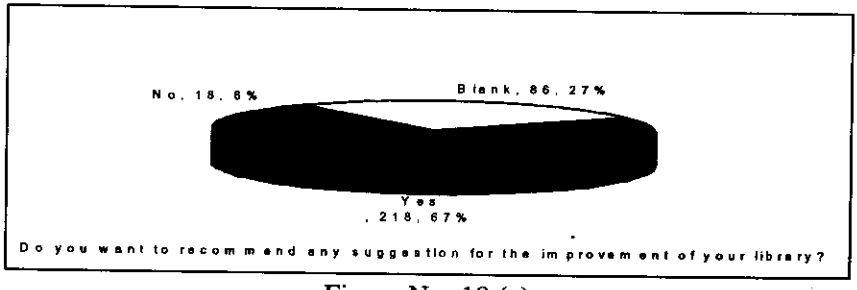


Figure No.-18 (a)

Some major suggestions are shown in the chart 18 (b, & c).

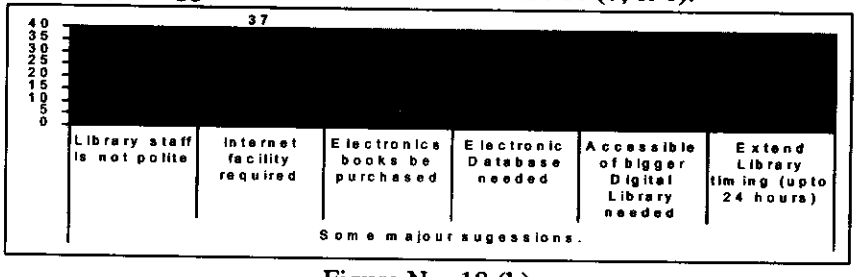


Figure No.-18 (b)

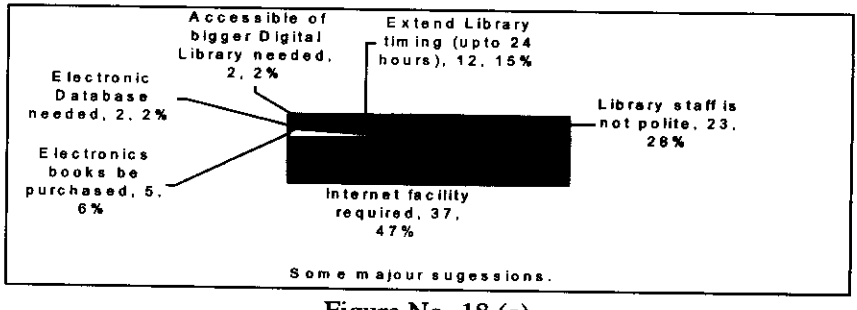


Figure No.-18 (c)

Demand for Internet facility got the top priority among the respondents. 47% demanded Internet facility with high speed, 28% wants reforms of library staff, 15% wants extended hour library services, 6% requires e-books, 2% each wants electronic database, and accessible of bigger digital library.

CONCLUSIONS

- 22% users accessing e-journals, and 31% using CDs based e-data. They are much eager and have demanded for e-books as these are much time saving for preparations of assignments etc.
- 54% are satisfied with ICT based library services, 45% are not satisfied due to single computer at issue counter. They demanded more terminals at lending counter.
- 55% are not satisfied with the number of terminals in the library. They need more terminals with high speed connectivity.
- 62% respondents are browsing Internet daily for educational purpose.
- 40% rated 'Good' to library staff, and 39% rated as average. Library staff some times loose patience due to over load and less number of man power, and lack of other infrastructure.

REFERENCES

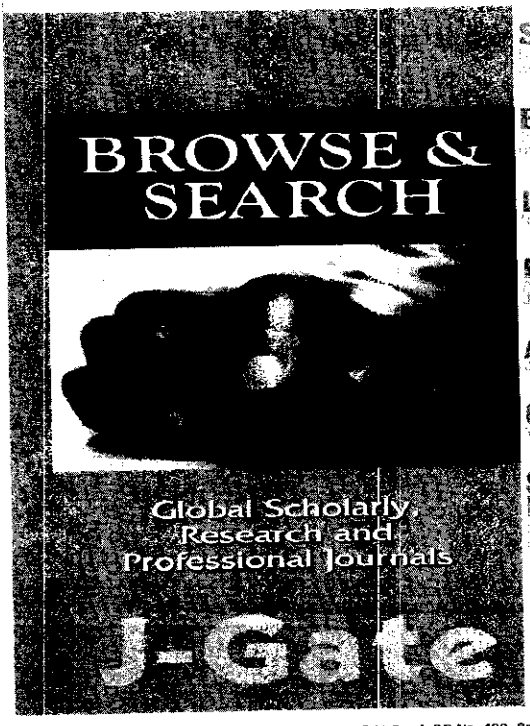
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Technical Session V
The Internet based Resource and Services

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E-Books: Basic Issues, Advantages and Disadvantages

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ABSTRACT

As electronic book content becomes progressively more and more easily available from content providers. The recent years may be seen turning point for the e-book but libraries have been involved in the process of building traditional and e-book collections for almost a decade in a hybrid library and information centres environment. This paper attempts to discuss the present scenario about the libraries and information services in digital era. In this fast changing world users seem to have less time for reading the whole books, articles etc. Therefore, it is essential for library professionals to provide this information to the users within the shortest possible time through e-resources using appropriate information and communication technologies (ICTs)

Key words: E–books, Collection Development, Academic Libraries, India.

INTRODUCTION

Manuscripts formed majority of library collection in ancient libraries. Invention of printing technology in mid- 15th century revolutionized the production of books in printed form. Publication of books and journals on magnetic media microfilms and microfiche- followed suit in the 1930s. In fact, space problems, which the libraries were facing, led to the use of magnetic media publication of books. But this media could not find acceptance of their users due to various factors such as strain on eyes, cumbersome retrieval of information, etc. Meanwhile computing technology was developed in 1960s, and with it, some time later towards the end of 20th century, were invented other media such as optical discs, digital versatile discs for recording of information.

The new media has been found to be highly robust, more reliable, cheaper and helpful in faster retrieval of information in contrast to other media. With these advantages, it has sent the microfilms and micro fiche into oblivion, and now the suzerainty of print media is under threat. Availability of information on websites, dimension to collection development policy. Since information is now available on a variety of media in a variety of forms, the libraries will have to reformulate their collection development policies to incorporate new challenges and concerns into the acquisition process, such as site licensing, copyright issues, procurement of information in all forms on all media, and how access will be provide to various electronic resources.

The most recent trend in the book industry is the development of electronic books (or E-Books), which has the potential to be the most for-reaching change since Guntenberg's invention.

EVOLUTIONAL CONCEPT OF E-BOOKS

A huge amount of articles about of e- books is available in LIS literature. Sinha (2008) traced a brief overview on the evolution of e- books. She described that in the early 90s, electronic content became popular as publishers sent print books accompanied by floppy disk or CD- ROMs. This promised added value for students and researchers' built caused numerous problems for libraries, from processing to circulation. Ultimately, such issues became doubtful since most librarians were double minded that these formats would endure for scientific and scholarly content. With web- based access, however, it's rare to find a library that does not have significant numbers of electronic resources even as it continues to build its print collections. Over the last 15 years or so, both content providers and libraries have overcome, or at least leaned to deal with the many challenges e- books present in terms of pricing, licensing, access and workflow. The electronic book, however, in many respects, seems to be more problematic and more difficult to incorporate into library collections and processes.

The history of electronic publishing dates back to six decades. One of the non- military applications of the computer technology took place with the project of Faher Roberto Busa on the works of St Thomas Aquinas. The American Chemical Society began alerting scholars to new developments through electronic means as far back as 1962. In 1971 MEDLINE was launched and project Gutenberg issued its first electronic text of 'The Declaration of Independence'. In 1970s the large business organizations that focused on electronic publications came to the fore. Dialog and ORBIT emerged in 1972 while LEXIS in 1973. Since then digital products have mushroomed throughout the world.

In 1990s it became for the first time cheaper to publish a reference book on CD- ROM than it did in print format (Lee & Boyle, 2004). Meyers (1996) given a reference of an article written by Lancaster titled as "The Evolution of Electronic Publishing" (Library Trends, Spring, 1995). The international digital publishing Forum (IDPF) reports that wholesale trade E- book sales in the United States have increased from $1.6 million in 2002 to $11.6 million by the second quarter of 2008 (IDPF, 2008). Outside the US, an example, the digital content Association of Japan (DCAJ) reported that sales of electronic books increased almost 70% from 2005 to 2006 (Anime News Network, 2007). The e–library management conducted an international E- book survey in the spring of 2007 to know the e–books subscription by libraries. The survey results showed that of 552 libraries, 88% owned or subscribed of E-books, with 63% responding that they owned or subscribed to over 1,000 e-books (Mularkey, 2007).

COLLECTION DEVELOPMENT OF E-BOOKS IN LIBRARIES

E-Book acquisition counties to increase, though most libraries agree that it will be many years, if ever, before their collections become electronic only. However libraries committed to a long- term electronic only goal. Toward that end, they do not acquire print copies. There are a number of sites published primarily by libraries or library experts like Uta (1998), Herzog (2004) and Twists- Brooks (2007) discussed collection development issues and challenges about e-books in detail. Uta emphasized a clear collection development policy for e-books.

EVALUTION OF PUBLICATIONS

E-Books must be judged with respect to following technical features and usability aspects:

A- Technical Implications

E-Books should be usable with widely available software like internet explorer, mozila fire fox etc. if special hardware or proprietary software is required, like in Ebrary or Taylor & Francis e-books, you need user's training touse this special software for accessing e-books.

B- Technical Standrards

Standards for setting up and maintaining e–resources are evolving and should be applied to e-books in order to allow seamless interconnection with other information systems and to be prepared for technological changes. Standardized location description (SLD), metadata (for describe the e–books), and archiving (to guarantee future access) are the required areas for standardization.

C- **Accuracy and Currency of Maintenance**
The provider of e- books must well- maintained and updated his website regularly. Long term commitment regarding maintenance of the offered e-books is a critical selection criterion for the acquisition librarians.

D- **USAGE CONDITIONS**
In process of selection of e-books we should review the usage conditions carefully. Unacceptable restrictions like no facility of downloading of books or time limit selection for reading of e-books can prevent libraries from buying or subscribing to collection of e- books. During the selection process priority must be given to common as well as potential users.

E- **PRIORITIZATION OF THE PUBLICATION**
Among the available collection of the e- books we must select the collection according to information needs of our library users

F. **PURCHSING/ SUBSCRIBING TO THE PUBLICATION**
Obtaining e- books is much more complex than the purchasing of print books. Access and usage conditions can vary for different publishers and vendors. A number of issues need to be considered:

G. **ACCESS CONDITIONS**
Librarians must be aware that "obtaining e- book or e- books" usually means leasing access rights for a given time rather than obtaining physical items. At the end a leasing period, libraries may be left without anything. Further access to these e- books will depend on the way the librarian archived and made accessible to his/ her users. It is obvious that archiving should be done by institutions with long term commitment to this issue, and librarians should advocate a stable and reliable solution.

H. **USAGE CONDITIONS**
Attention should be paid to the following questions while reviewing the agreement about the use of e- books: How are "use" and "user" defined in the agreement? Will librarians be held accountable for how users are (or misuse) the publication? Can the publication be used for inter- library loan? Will the "fair use" concept be adhered to? Will the publication be archived and if so, who will be responsible for archiving it, librarians or vendors? Is future access to titles published during the subscription period covered by the agreement even if a subscription has been cancelled in the meantime?

I. **COSTS**
Libraries may have an option to choose among various pricing

models based on different access conditions (number of simultaneous users, total number of logins etc.). Access through library consortia seems to be an advantageous solution. In addition, the costs involved in e- books are not limited to the obvious access fee, be it through subscription rates, on a pay-per-view basis, or through consortia. A reliable and fast internet connection with standard telecommunications infrastructure is required to keep up with the rising demand.

ADVANTAGE OF E-BOOKS

1. E-Books take up less space.
2. They are quicker to obtain.
3. E-Books are more updated and upgraded. It can have the most up-to- the – minute information available.
4. E- Books save the time.
5. Usually one gets for more than just the book.
6. Most E-Books are sold with bonuses and related information that usually don't come with the purchase of a traditional book.
7. E- Books help us to save trees and help reduce pollution from pulp mills.
8. E-Book don't use up trees: E-Books use very few natural resources.
9. They are more portable and have quick and easy access.
10. References can be hot- linked: Easy links to websites and other referenced can be placed in an electronic book.
11. It can be custom branded: other people's E- books can be branded with one's name and one can allow others to brand one's E- Books with their name.
12. The technology will get better: this is an emerging technology and people are often slow to change. As the qualities of monitors improve we will be reading electronic books.
13. Authors and editors can create discussion lists on particular topics and data.
14. Progress towards creation of a virtual library.

Disadvantages of E- Books

- E- Books have no life long.
- Lower Sales.

- Requires equipment to be read.
- Low market penetration.
- Different standards currently in use.
- As accessible as print based books.
- e- Books are now available in a variety of forms like 'PDF' for Adobe Acrobat, text formats, HTML and disks for windows. Keep in mind that not everyone has the latest technology. Mac users often encounter compatibility problems as well.
- Some one could buy your E- Book, make copies and distribute them.
- E- Publishers are quick to note that piracy shouldn't prevent an author from publishing their E- Book. Since electronic marketing isn't a lucrative, bootlegging copies isn't a real threat.
- Always dependence on the equipment.
- Difficulty in reading from computer.

THE FUTURE OF E-BOOKS

The Future of E-Books will see a continuing proliferation of platforms with a built in e- reader function. E- reader software has already spread to cell phones, PDAs, portable gaming systems and elsewhere, in addition to residing in dedicated e- trader devices and personal computers. The continuing spread will familiarize more and more people with the e- reading experience and its benefits.

E-reader platforms will evolve in a variety of ways, particularly in their screen technology. The e- paper screens on today's e- reader devices, for example, will grow from today's 5 to 6 inch diagonals to 8, 10c and 14 inches.

The latest sales figures for e- books are out and they look good!13

In the Education Sector: According to Ingram's Education solution unit, e- book sales from January to May surpassed the 2007 figures by 400 percent. Respondents to the survey said there were three key factors that led to purchasing electronic books. They were cost, convenience and interactivity.

In the retail sector: International digital publishing forum, released the October sales figures from the Association of American publishers (AAP). The data shows sales of $5.2 million, a 73% increase over the same period in 2007. Since the figures represent only the 12 to 15 trade book publishers willing to supply their data, these figures could be on the low side.

In Japan: Mobile phone sales of electronic books grew 331.3% from 1.6 billion yen (about US$14 million) to 6.9 billion yen (US$58 million) in

2006. The non phone internet sales of electronic books grew 69.7% from 4.8 billion yen (US$41 million) to 8.1 billion yen (US$68 million). Projects are that mobile phone sales of e- books will increase to 11.7 billion yen (US$99 million) in2007, compared to a projected 9.4 billion yen (US$79 million) for internet sales. (The Digital content Association of Japan)

CONCLUSION

E-Books have bearing on all spheres of library management, and traditional collection management is required to be improved to stay valuable. It is not possible to adopt a uniform set of rules pertaining to electronic publication which can be equally applicable to all libraries; each librarian has to finds indigenous way out to facilitate local users. A relatively market- oriented approach in evaluating information resources has been adopted on account of the electronic environment. Librarians can decide from among an assortment of access conditions while dealing with e- publications. This newly found elasticity paves way for an externally augmented liability for the individual librarian.

Inclusion of e-books as an essential part of library collections ahs turned out to be quite beneficial in recent years. Whereas libraries were initially skeptical about the utility and desirability of this format of library users, and were reluctant to relinquish collection development activities to publishers and aerators offering E-book collections, libraries are more frequently engaged in appraising print and electronic books simultaneous for developing subject collections. Now that the publishers offer the electronic editions along side print editions, the task to develop e-libraries has become easier.

Will the e-book ever replace printed books? No-not any more than online database have replaced reference libraries. The book publishing industry is alive, well, and healthy. When the technology and marketing of e-books become developed and well accepted, they will certainly find a niche and will be attractive to certain type of users. Print has many rights and powers that e- books don't have. We like e- books but we must allow ourselves to be locked into technology or legal/ social paradigms that impair our ability to support open research, teaching, and public discourse of our community. Librarians' motto is to supply the right information, at the right time to the right person any way by obeying the fundamental five laws of library science.

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Google Groups: A New Dimension for Providing Effective Library Services

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ABSTRACT

Applications of Internet and its services have become inevitable in the era of information explosion and effective use of internet will defiantly helps in performing library operations and services more effectively. The paper focuses on how Google groups can be used for providing library services. It also explains how to create library Google groups for providing effective library services to the users. The important features of Kuvempu University Library and Information Science (KULIS) forum are also discussed.

INTRODUCTION

One of the most significant achievements in the information and communication sector is the introduction of advanced communication network. Today Internet has become one of the most important modes of communication and its services are being exploited by people in every walk of life such as education, research, business, defence, medicine, engineering, etc,. Many companies are providing plenty of services on the web to the cyber users. These services are used for a variety of purposes ranging from a sending a mail to library user to selling goods and providing information to customers. E-mail, information search, internet talking, chatting, web forums are major services which available on the web can effectively used for retrieval as well as dissemination of

information. Web forums are a structured way for professional members to discuss topics of interest to the subject. Using these forums members can enter ideas or comments into an easy-to-use template and post them to a specially designed web page. Other members can read each posting and respond online. These forums are useful to provide effective library services in many ways. Library services viz., CAS, SDI, new arrivals in the library, news paper clipping service, etc can be effectively provided to the users of the library.

WEB FORUMS

A web forum is like a message bulletin board where messages are posted on the forum and members visit the forum with their web browsers to read and reply. It is known as discussion forums as well. Web forum is similar to mailing list and newsgroups in many ways. The difference between web forums and mailing lists is that web forum does not push messages into one's boxes; users have to go out and get it. In comparison, if you subscribe to a mailing list, messages will be pushed into your mail box, whether you like it or not. However Web forums and mailing lists (as well as newsgroups) can be used widely to meet different needs of library users. These also help in stimulating debates and reflection on a wide range of topics related to job opportunities, activities in the departments as well as providing answers for library professionals working in specialised areas. Today Web forum has become an online center for ongoing, in-depth discussions of specific topics and issues. It should be noted that the forum is not a "chat room." That is, users cannot participate in real-time discussions. However, users can ask and respond to questions, explain service techniques and strategies, share helpful anecdotes, and lend their expertise to others in the field.

WHAT IS GOOGLE GROUPS?

Google is the most popular service providers on the web providing many services to internet users. Founders Larry Page and Sergey Brin named the search engine they built "Google," a play on the word "googol," the mathematical term for a 1 followed by 100 zeros. The name reflects the immense volume of information that exists, and the scope of Google's mission: to organize the world's information and make it universally accessible and useful. Google is providing many services viz., web search: search billions of web pages; scholar: search scholarly papers; images: search images on the web; Google chrome: a browser built for sped, stability and security, groups: create a mailing list and discussion groups etc.

A Google Group is a user-owned group created using the Google Groups service. Google Groups not only allows you to manage and archive your mailing list, but also provides a method for true communication and collaboration with group members. Unlike other free mailing list

services, Google Groups offers generous storage limits, customizable pages, and unique management options. Google Groups is a service from Google that supports discussion groups, including many Usenet newsgroups, based on common interests. Membership in Google Groups is free of charge and many groups are anonymous. Users can find discussion groups related to their interests and participate in threaded conversations, either through a web interface or by e-mail. They can also start new groups. Google Groups also includes an archive of Usenet newsgroup postings dating back to 1981 and supports reading and posting to Usenet groups. Users can also set up mailing list archives for e-mail lists that are hosted elsewhere.

How Google groups can be used for providing library services?

Google group will play an important role in discharging the functions of libraries. It is changing the ways, the librarians organise, manage and disseminate information. Today all sorts of library services from membership registration to CAS can be offered through the Google groups

- By designing clearly organised and easily accessible Google groups, librarians can extend the traditional librarianship to the use of information technology and seize a leadership role in both fields.
- Google groups can assist library users to discuss specific topics or maintain 'conversations' between users.
- Each member of a group can create a profile, including a picture and quote and users can share information and even find other members using search.
- This can be used to address topics that could not be covered at face-to face meetings, due to time constraints.
- Google groups can also be useful in reference work where Reference librarians use a multitude of information sources to answer the question they are asked, these are called ready reference collection. This can be successfully utilised for providing short-range and long-range reference service because various primary and secondary sources of information are available online from many sites.
- Librarians can have access to the catalogue of various libraries attached to the universities and colleges in the world and accordingly place a request for their users using this group.
- In Current Awareness Service, Google groups can be used to highlight news or resources of interest; and post book reviews from students, faculty and staff members.

- E-CAS services can be effectively provided and newspapers clippings are also to be shared among the library users.
- Librarians can post list of new acquisition, library news, events and they can also seek feedback for ideas about improvements in existing services.

How to create your Google groups?

You need a Google Account to create a group or post comments in the Google Groups service. Google asks for some personal information when you create a Google account, including your email address and a password, which is used to protect your account from unauthorized access. A Google account allows you to access many of Google services that require registration. You may search for and read comments in public groups without registering for an account. The contents of the postings, custom pages and files, including any text, images, photos, videos, and audio, that you submit to Google Groups are stored and maintained on Google servers in order to publish these items and provide the service.

When users view your profile, they will see your profile information as well as links to posts, custom pages, and files that would normally be accessible to them. If you do not create a profile, only a "masked" version of your Google Account email address will show with your submitted content. Information and content you post in a Google Group - including the header information, nickname and email address associated with the posting - will be displayed to users who are able to access the group. Similarly, all information that you enter in your user profile can be viewed by other users. The owners of a Google Group decide who is in the group and whether a discussion is public or restricted. Use care when posting personal information in a group, particularly sensitive information such as social security numbers, financial information or home addresses or phone numbers. Figure-1 shows the home page of Google groups.

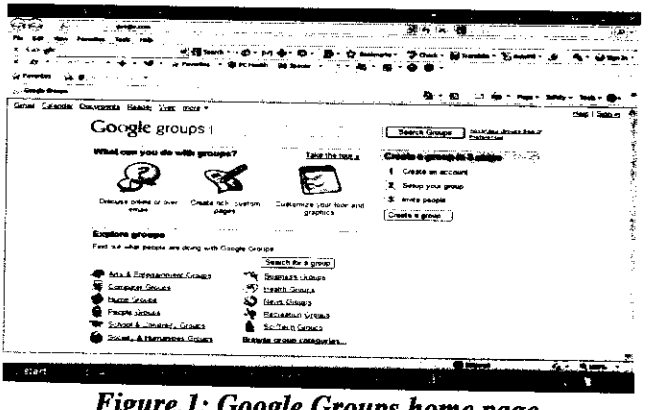


Figure.1: Google Groups home page

KULIS FORUM

Kuvempu University Library and Information Science (KULIS) forum came in to existence on 9th July 2006. This forum has been created for the benefit of students and alumni of Library and Information Science, Kuvempu University. Member of this forum can post mail, interact, discuss on any topic or issues. Members of this forum can also post messages on job openings/opportunities, seminar events, various activities taking place in their libraries etc. The home page of the KULIS forum is http://groups.google.co.in/group/KULIS-forum(figure-2).

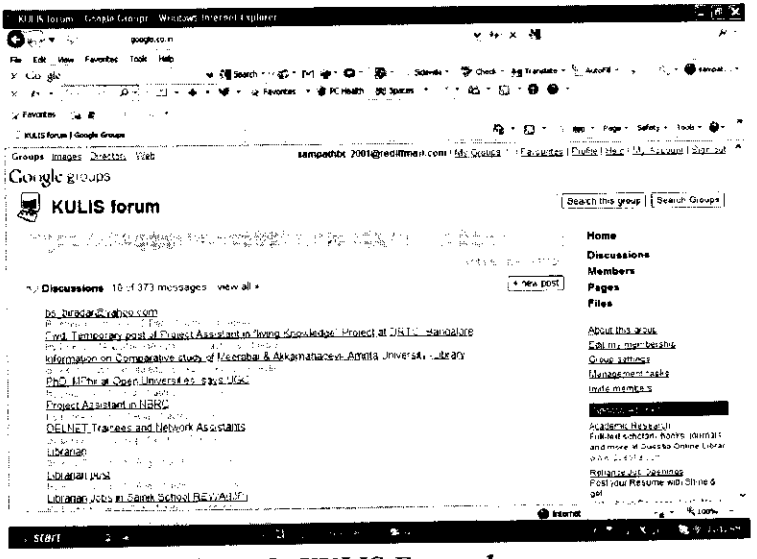


Figure.2: KULIS Forum home page

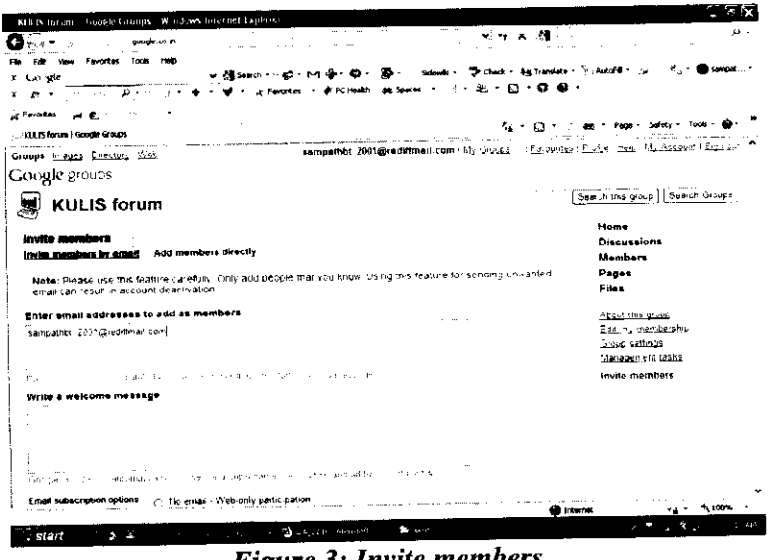


Figure.3: Invite members

Who can participate?

KULIS Forum is not an open discussion board that requires a login registration for users. It is restricted to only students and Alumni's of Library and Information Science, Kuvempu University, Shivamogga, Karnataka. Moderator will invite the members to join in the forum or directly add their e-mail to the groups (figure-3).

Is the forum moderated?

KULIS forum is moderated in the sense that a moderator will see each post and are screened before they are uploaded (figure-4). Therefore, members of the group who submit messages will not immediately see them on the board. Messages that are accepted for discussion will be posted within few minutes/hours. Members of the forum have to send messages to kulis-forum@googlegroups.com.

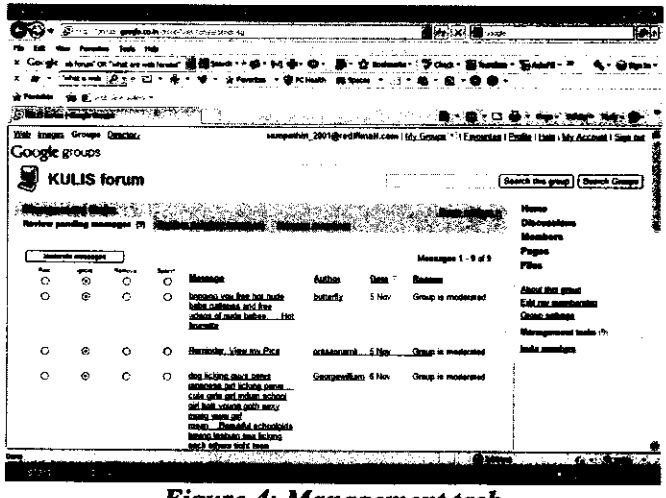


Figure.4: Management task

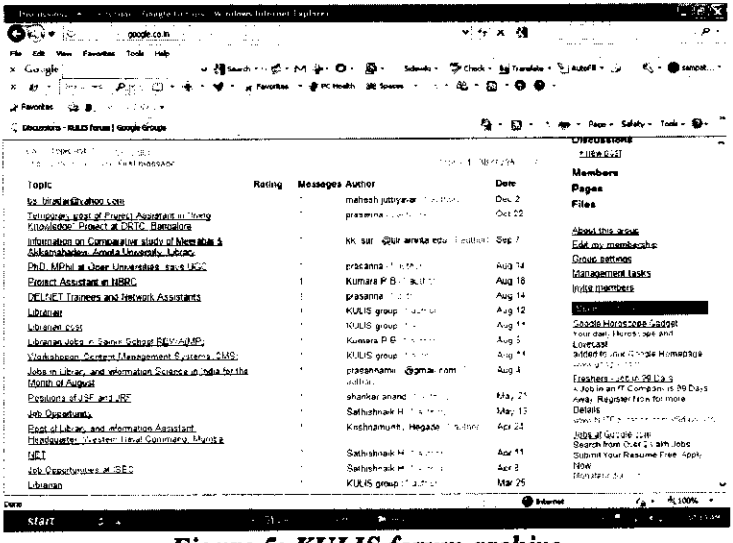


Figure.5: KULIS forum archive

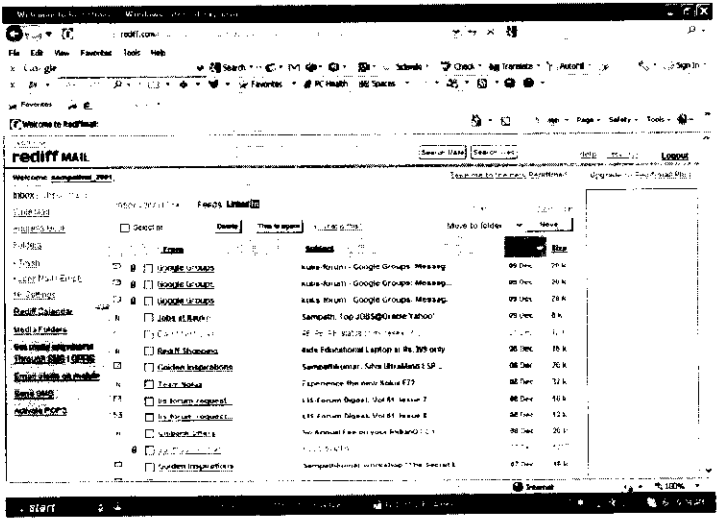


Figure-6: Google groups e-mail

KULIS Forum Archives

All messages can be saved in an archive for later review on the web and the archive can be open to all not limited to members or limited to moderator. Figure-5 illustrates the archive of KULIS forum.

Discuss online or over email?

Members can choose whether they want to read and post messages online, or to just use their current email account to read and respond for

the message. Figure-6 indicates mails received from the KULIS forum to personal e-mail account.

CONCLUSION

Today libraries are shifting their role from the custodian of traditional information resources to the provider of service-oriented digital information resources. Information Communication technology has been one of the major factors causing changes in the dissemination of information. Wide spread use of computers, increased reliance on the computer networks, rapid growth of internet and its services have more impact on library services. Thus Google groups will play a major role in proving various modern library services. However this tool can be the best used only when library professionals try and apply it in their libraries. These kinds of tools will become a platform for all the library users to share, discuss and comment on various issues and topics.

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10. Why are Web forums so popular? http://natalian.org/archives/2005/12/07/why-are-web-forums-so-popular/

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Internet Resources on Library and Information Science

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ABSTRACT

Internet and online information resources provide seamless access to wide variety of information ranging from primary to tertiary sources. It reduces barriers in publication facilities quick revision of documents and makes information easily available universally. The present study aims to explore & evaluate some of the Library and Information resources available on the internet. The study also suggests some remedial measures to improve quality consciousness among the Librarians.

Keywords: Internet, Internet resources, Evaluation, LIS

INTRODUCTION

Internet is becoming an everyday media. Identification and exploration of information resources on internet is an essential function of every organisation for survival in the present fast changing world. In this context, internet has emerged as an important source of current information. The production and dissemination of information through paper media has certain inherent disadvantages, such as publication delays and limited clientele. The electronic access to online sources helps users to overcome the problems. The internet also help scientists, engineers, industrialists and also common man to communicate faster through e-mail, teleconferencing, discussion forums and USENET, news services. The scope of the article is to explore the information resources available through internet for development and growth of the library.

OBJECTIVES

It is important that existing and potential users of Library and Information Science are made aware of major Internet Resources and potentialities of resources in accessing, retrieving and dissemination of data, information and other resources. The main objectives of the present study are to-

1. Identify important resources on library and information science which are available on the internet
2. Review of literature
3. Find out the criteria and evaluate websites for establishing quality and authenticity of information.

SCOPE

Library and information Science is a very vast subject area and contains a large amount of Information. Information in Library and information Science has rapidly increased day by day due to information explosion. However with the advent of internet, locating information resources has become quite easier and time saving because all types of information we can get in one go without running up and down providing we give a correct information (example typing the keyboard correctly) to the computer. All types of information resources are now made available on internet ranging from all kinds of databases to E-journals, E-book and other forms such as table of contents, preprints, technical reports, dictionary, encyclopaedia, library catalogue, Institution associations, directories, newsletters etc. produced by various publishers of the world.

The present study is an indication of developments that are taking place in the generation and dissemination of Library Science information on the internet. Many believe that Internet is a new paradigm in significance to that of the invention paper, printing and computing technologies. Internet is breaking national boundaries, albeit in a virtual environment and bring begun to fundamentally alter the way research and education was being conducted.

METHODOLOGY

For this study literature available in the IIE, IIT-Guwahati, NPTI library were scanned and relevant information available on the internet was also downloaded. There are four methods followed to find out information on internet:

1. By going directly to the site after knowing the address(URL)
2. By accident (sometimes through serendipity while browsing or surfing the net).
3. By using subject directories which are provided.
4. Using both Indian and International search engines.

LIMITATION OF THE STUDY

The study of Internet Resources is unlimited because it provides access to internet globally to the user community. The wider scope of study helps the user community to access information for various purposes. It is not possible to study in detail within limited time period so only selected area of the topic has been chosen for study.

INTERNET RESOURCES

A. DATABASE:

Library and Information Science personnel are increasingly becoming aware of the fruit of information technology as exemplified by the day by day use of such terms as electronic library, electronic journal, teleconferencing, videotext, optical disks, tele-facsimile etc . Another word which is much use, is Database, In simple terms, any centrally controlled, integrated collection of logically organized data can be called Database. The filing cabinet of a personal secretary of a company containing personnel. A record of all of the firm's employs constitutes a database. The *Directory of Online Databases* defines databases as collections of related or textual and/or numeric data in machine readable form that are processed for computerized publishing and/or electronic dissemination. They are the sets of computer held structured records, which can be approached by means of search keys. Online databases are organized collections of computerized information or data such as periodical articles, books, graphics and multimedia that can be searched to retrieve information. Databases can be general or subject oriented with bibliographic citations, abstracts, and or full text. The sources indexed may be written by scholars, professionals or generalists. Online databases that are retrieved on the World Wide Web are generally non-fee based, lack in-depth indexing, and do not index proprietary resources. Subscription or commercial databases are more refined with various types of indexing features, searching capabilities, and help guides.

ADVATAGES OF USING ONLINE DATABASES

1. Millions of records in a subject can be searched within minutes which is virtually impossible in a manual system
2. There can be more access points for a record which make the search all the more easy.
3. The user is actively involved in the search can instantly change the search strategy.
4. A library and information centre can serve more users with this facility.
5. Access to databases which have no printed version like *Toxline* is also possible through on-line searching.
6. The problem posed by the geographical barriers to easy access to information are overcome through this method.
7. The range and diversity of databases are more and through vendors it is easy to switch over from one database to another.
8. Since databases are always kept up-to-date, search, searcher gets earlier access to references than any other method.

EXAMPLES OF SOME LIBRARY SCIENCE DATABASES

A. **Library and Information Science Abstracts(LISA)/1969**

URL: http://www.csa.com/factsheets/lisa-set-c.php

Creator of Database: H.W. Wilson

Nature of Publication: Web

Subject Coverage: Artificial intelligence, Book reviews, CD-ROMs, Computer science applications, Information centres, Information management, Information science, Information storage, Information technology, Internet technology, Knowledge management, Librarianship, Libraries and archives, Library management, Library technology, Library use and users, Medical information, Online information retrieval, Publishing and bookselling, Records management, Telecommunications, Technical services, World Wide Web.

Description: LISA is a valuable reference tool for current awareness in Information Science. Comprehensive coverage allows access to past, present and ongoing developments in Librarianship, information retrieval, online retrieval, new information technology and publishing. LISA includes abstracting and indexing of 500 periodicals from over 60 countries along with unpublished academic and institutional research from the current research.

Scope: Indexing 1969

Information: Citations, Abstracts, Full Text

Update frequency: Every 2 weeks with more than 500 records added per update.

Size: Over 323,938 records as Nov 2009

Thesaurus: An online thesaurus is available.

B. Literature and Information Science Full Text
URL: www.library.pitt.edu/articles/database_infoliblit.html
Creator: H.W. Wilson
Nature of Publication: Web
Subject Coverage: Library Automation • Care & Restoration of Books • Cataloguing • Censorship • Circulation Procedures • Classification • Copyright • Education for Librarianship • Electronic Searching • Government Aid • Indexing • Information Brokers • Internet Software • Library Associations & Conferences • Library Equipment & Supplies • Literature for Children & Young Adults • Personnel Administration •

Preservation of Materials • Public Relations • Publishing • Rare Books • Reference Services • Web Sites.

DESCRIPTION

Library literature and information science is a bibliographic database covering Library and Information Science. It indexes English and foreign language periodicals, selected state journals conference proceeding pamphlets books and library school theses puts over 300 books per year. This invaluable resource delivers full text articles over a hundred selected publications. PDF page images of the full text articles brings researchers charts, graphs, photos and other valuable graphical information providing enhanced access to periodical collection. Its a unique working and teaching tool created by librarians for librarians with quality indexing.

Full text: Over 155 journals.
Equivalent: Library Literature
Records added annually: 12700+
Coverage: Indexing 1984 – present
Full text 1997 – present

C. **Information Science Abstracts (ISA)/ 1969-**
URL:www.library.pitt.edu/articles/database.info/isa.html
Subject Coverage: Information Science, Librarianship.
Description: Information Science Abstracts(ISA) is a valuable reference for current awareness in Information Science. Comprehensive coverage allows – access past, present and ongoing development in librarianship, Information Science, online retrieval, new information technology and publishing.
Scope: Indexing 1969-
Update frequency: Quarterly

D. **ERIC(Cambridge Scientific Abstracts)/1966-**
URL: www.library.pitt.edu/articles/databaseinfo/ericsp.html
Creator: Cambridge Scientific Abstracts
Subject Coverage: Education, Library and Information Science
Description: ERIC, the Educational Resources Information Center is a national information system designed to provide ready access to an extensive body of education-related literature. Among other services, 16 subject-specific clearinghouses produce special publications on current research, programs, and practices. Many of these publications are available full-text on their web sites.

ERIC contains references with summaries from education journals and documents (i.e. books, pamphlets, conference reports, symposia, studies etc.).It contains of two files: Resources and education (RIE) file of documents citations and the current index to journals in Education (CIJE) file of journal articles citation from over 750 professional journals. In addition ERIC contains over 850 ERIC Digest records that features the full text of the original document. ERIC also contains resources on training and development and Library and Information Science.

Scope: 1966-
Updated: monthly
Medium: web
Access: Internet delivered database

Resources Publications: Resources in Education (RIE), and Current Index to Journals in Education.

COMPARISION OF THE LIBRARY SCIENCE DATABASES

DATABASE NAME	LISA	ISA	ERIC	Library Literature
Availability	Networked	Networked	Networked	CD-ROM Information Sciences Lib.
Interface	SilverPlatter	SilverPlatter	SilverPlatter EBSCOhost	WinSPIRS
Date Coverage	1969-	1966-	1966-	1984-
Update Frequency	Quarterly	Quarterly	Monthly	Quarterly
Number of journals	550	450	750	234
Geog. Coverage	60 countries	International	U.S. / Education	International
Significance				
TEXT LEVEL				
Citations	Yes	Yes	Yes	Yes
Abstracts	Yes	Yes	Yes	No
Full Text	No	No	850 Digest Records	No
Images	No	No	No	No
Content Tips & Comments	Research in progress in the Current Research in Library and	Lib Sci records from ERIC; conference proceedings	Research & technical reports as well as education	Library School theses, pamphlets, and

	Information Science (CRLIS) database subset		related journal articles	conference proceedings
SEARCHING				
Display Options	Change Display button, extensive options	Change Display button, extensive options	Change Display button, extensive options	Switch to all fields (button at bottom)
Boolean Operators	And, Or, Not	And, Or, Not	And, Or, Not	And, Or, Not
Truncation & Wildcard Symbols	* for stemming ? one character	* for stemming ? one character	* for stemming ? one character	* for stemming ? one character
Proximity Operators	near# in same sentence with# in same field	near# in same sentence with# in same field	near# in same sentence with# in same field	near# in same sentence with# in same field
Phrase Searching	Is the default No " " needed	Is the default No " " needed	Is the default No " " needed.	Is the default No " " needed
Natural Language Searching	No	No	No	No
Field searching/ limiting	Yes, in Search & Search Builder	Yes, in Search & Search Builder	Yes, in Search & Search Builder	Yes, limit button or Utilities, Field List
Controlled Vocabulary	Index, Thesaurus, descriptors	Index, descriptors, subject classification	Index, Thesaurus, descriptors, identifiers	Index, descriptors
Basic/Advanced	Search/Search Builder	Search/Search Builder	Search/Search Builder	No
Help Available	Yes. See Database Info. button on frame index	Yes. See Database Info. button on frame index	Yes. See Database Info. button on frame index	Help on menubar, select Guide and then Library Literature
Searching tips/comments	Can save searches using "Save History.".	Can save searches using "Save History."	Can save searches using "Save History."	Use hyphens to narrow descriptor search. See Guide for explanation of

			Read guide for information about useful fields such as target audience & document type.	Add to Search feature, lateral searching, save search histories
COPYING				
Printing	Yes	Yes	Yes	Yes
Downloading	Yes	Yes	Yes	Yes
Emailing	Yes	Yes	Yes	No

EVALUATION FOR CAPABILITY OF A DATABASE IN LIBRARY

The database is evaluated on the same criterion on which the printed reference sources are evaluated. In addition to those, there are some other measures are considerable in evaluating online databases, such as storage of materials in the databases and their forms, deep and quick knowledge of information, the common and specific types of need of the users that differs in each database. How and in how many quantity databases can be update, and which type hardware and software be needed?

Therefore the following points can be considered for evaluation of a database.

Scope:

1. For the scope of database, it is considered that all the periodicals, reports, documents etc which are indexed and abstracted in printed forms, are included in the database or not.
2. Whether the manufacturer or the vendor has clarified that which periodicals are indexed in the database and which are indexed on selection basis? The publishers, who print the index, use this method occasionally, but manufacturers of the databases never use this method.
3. The periodicals which are indexed in the database, whether their publication addresses along with short name of the publisher are given in the database or not?
4. Whether ISSN has been used or not?
5. Whether the database represents reference only or represents the abstract also?

6. Whether the full bibliographical details of the periodicals given in the database or not?
7. Which method is used in indexing? The method used should be in that position, so that the retrieval of information may possible from the points such as year, language, geographical location and other items.
8. Whether in indexing the specific terminology for online database is used or not? The simple terminology cannot be used to represent the micro and extensive thoughts of the subject.
9. How much is the effectiveness of the access points in the databases which are represented for search? Whether the number of search terms and Boolean operators has been used properly?
10. Whether the vendor of database has provided rules, regulation and guidance for using the database or not?

DICTIONARY AND ENCYCLOPAEDIA

Very often, the first step in answering a query is to define the term .For this purpose a dictionary is considered as a excellent source of information. A dictionary contain the words of a language or a term of a subject profession or vocation arrange according to some definite order, is usually alphabetical one giving there meaning, pronunciation, spelling, syllabication, use etc.

EXAMPLE OF ONLINE LIBRARY SCIENCE DICTIONARY AND ENCYCLOPAEDIA

A. **ODLIS: Online Dictionary for Library and Information Science**

URL: http://lu.com/odlis

Creator: Joan M. Reitz, Associate Librarian for Instruction Ruth A. Haas Library, Western Connecticut State University

Subject Coverage: Library Science including academic library, public library etc.

Purpose of the Dictionary: ODLIS is designed to be a hypertext reference resource for library and information science professionals, university students and faculty, and users of all types of libraries. Expansion of the dictionary is an ongoing process. The dictionary includes some slang terms and idioms and a few absolute terms, often as broad in scope, ODLIS includes not only the terminology of the various specializations within library science and information studies but also the vocabulary of publishing, printing, binding, the book trade, graphic arts, book history, literature, bibliography, telecommunications, and computer

science The dictionary includes some slang terms and idioms, and a few obsolete terms, often as See references to the term in current use. Definitions unrelated to library and information science are generally omitted.

B. **Online Encyclopaedia of Library and Information Science**

URL: http://sites.google.com/site/lisencyclo/

Creator: Badan Barman

Subject Coverage: Library and Information Science

Description: Articles of Online Encyclopaedia of Library and Information Science are arranged alphabetically for easy browsing according to the name of the article(s) avoiding articles (A, An, The), in case of abbreviation, please use full form of the terminology for browsing as they are arranged accordingly in the "Sitemap".

E-JOURNALS

Electronic journals are defined in the heralds librarians glossary as' journals in which all aspects of preparation, refereeing, assembly and distribution are carried out electronically.' The phrase 'electronic journal 'is used to describe any journal published in some kind of digital format. Electronic journals provide desktop access- unlimited by time or geography.

Advantages:

1. Article text can be enhanced by hypertext and multimedia links.
2. Electronic journals demands neither library space nor shelving cost.
3. Enables searching articles contents by words/phrases
4. E-journals are available 24hours a day, seven days a week.
5. Many users able to consult the same article at the same time.

LIBRARY AND INFORMATION SCIENCE E-JOURNALS

The e-journals on Library and information science has been categorized into following subject categories:

1. **General librarianship and information management**

Title	URL
Ariadne	http://www.ariadne.ac.uk
Bibliotheck	http:www.pmpc.napier.ac.uk/scob/bibliotthk.html
International information and library review	http://www.academic press.com

Library journal	http://library journal.reviewsnews.com
Library quarterly	http://www.journalsuchicago.edu/LQ/home.html
Marketing library services	http://www.infotoday.com/mls/mls.html
Managing information	http://www.managing information.com
Progressive librarian	http:// www.libr.org/PL/

2. **Information Science and Research**

Title	URL
Active learning	http://www.ilt.ac.uk/public/cti/activelearning/index.html
Inform	http:www.iis.org.uk/inform
Information Research	http://www.informationr.net/ir/
Journal of American society for information Science and technology	http://asis.org/publications/jasis.html
Library and information Science Research	http://www.elsevier.nl/inca/publications/store/6/2/0/2/1/1/index.html
LIBRES	http://www.aztec.lib.utk.edu/libres/
Mini-annals of Improbable Research	http://www.improb.com

3. **Acquisitions**

Title	URL
Library Collections, Acquisitions and technical Services	http://www.elsevier.nl/inca/publications/store/2/9/3
Against the Grain	http:www.against-the-grain.com/

4. **Cataloguing and Indexing**

Title	URL
CONSERline	http://www.loc.gov/acq/conser/consrlin.html

5. Computing and Information technology

Title	URL
Biblio Tech Review	http://www. biblio-tech.com/
E-media	http:www.emediapro.net/
Information and software technology	http://www.elsevier.nl/inca/publications/store/5/2/5/4/4/4/index.html
Link-up	http://www.infotoday.com/lu/lunew.html

6. Document Management and supply

Title	URL
Journal of Documentation	http://www.aslib.co.uk/jdoc/

7. Electronic Information and the Internet

Title	URL
Information Today	http://www.infotoday.com/it/itnew.html
Internet on a Disk	http:www.samizdat.com/ioad.html
Journal of Electronic Publishing	http://www.press.umich.edu/jep/
Web Net Jrl: Internet Technologies, Applications and issues	http://www.aace.org/pubs/webnet/

8. Library Systems and Technology

Title	URL
Program	http://www.aslib.co.uk/program/

9. National and Regional Libraries

Title	URL
American Libraries	http://www.ala.org/alonline/

10. Societies and Associations

Title	URL
Aslib Proceedings	http://www.aslib.co.uk/proceedings/index.html

E-BOOK

Some confusion persists about the term e-book refers to: is it a piece of hardware, or the word and images on a piece of hardware, or both. The term book denotes both the message (word and images) and the medium(bound paper). The one without the other is not a book. An e-book is a term used to describe a text analogous to book that is in digital form to be displayed in a computer screen (*Cox and Mohammed,2001*).

Text in digital form, or a book converted into digital form, or digital reading material, or book in the computer file format, or an electronic file of words and images displayed on a desktop note book computer, or portable device, or formatted for dedicated e-book readers.

IMPACT OF E-BOOK ON LIBRARIES/LIBRARIANS

E-book technology created circulation challenges for libraries/librarian. E-book when downloaded, are lacked into a specific device due to encryption and each title on each has to paired for, so user can't select specific titles to take home on a readers this can be overcome by creating theme readers on which various titles can be loaded. This issuing and returning of e-book readers in time consuming. New users must be familiarized with the hardware during the checkout process. Libraries also have to have credit cards to purchase e-book instantaneously. The e-book market is aimed at the individual customer and vendors have no concept and little interest in library market. Replacing the readers lost or damages by users and cataloguing the devices the title on the devices remained a challenge.

E-BOOKS ON LIBRARY AND INFORMATION SCIENCE

1. **Assessing Information Needs: Tools, Techniques and Concepts for the Internet Age**

URL: http://www.ebooks.com/ebooks/book_display.asp?IID=178915

By:Nicholas,David
Published By: Europa Publications

Provides a systematic method of identifying, evaluating and comparing information needs, and examines the role of the Internet in meeting these needs.

2. **100 More Library Lifesavers: A Survival Guide for School Library Media Specialists**

URL: http://www.ebooks.com/ebooks/book_display.asp?IID=320736

By:Bacon,Pamela,S.
Published By: Greenwood Publishing Group

Writing for librarians working in elementary, intermediate, and high school settings, the author offers advice and activities in the form of 100 "lifesavers." The "lifesavers" are organized into ten "survival strategies," which cover such topics as distance learning, dealing with standards

3. **Learn Dewey Decimal Classification (Edition 22) First North American Edition (Library Education Series)** By Mortimer, Mary
URL: http://www.diesel-ebooks.com/cgi-bin/item/5551633969/Learn-Dewey-Decimal-Classification-Edition-22-First-North-American-Edition-Library-Education-Series-eBook.html

Both professionals and paraprofessionals can brush up their classification skills, how to build a call number, classification tables, the electronic version of the schedules and shelving.

4. **Integrating Geographic Information Systems into Library Services: A Guide for Academic Libraries** By Abresch, John /Hanson Ardis
URL: http://www.diesel-ebooks.com/cgi-bin/category/LAN025000/Library-&-Information-Science-ebooks.html

integrates traditional map librarianship and contemporary issues in digital librarianship within a framework of a global embedded information infrastructure. Coverage includes technical, legal, and institutional factors such as collection development, reference and research services, and cataloging/metadata, as well as issues in accessibility and standards.

5. **DLIST(Digital Library and Information Science and Technology)**
URL: http://dlist.sir.ariazona.edu

EVALUATION

1. Authority: a) Is it clear who is responsible for the contents of the page.?

b) Is there a link to a page describing the purpose of the sponsoring organisation?

c) Is it clear who wrote the material and are the author's qualification for writing on this topic clearly stated?

c) If the material is protected by copyright, is the name of the copyright holder given?

2. Accuracy:

a) are the sources for any factual information clearly listed so that it can be verified in another source?

b) is the information free of grammatical, spelling and other typographical errors ? if there are charts/graphs containing statistical data are the charts /graphs labelled and easy to read?

3. Objectivity: a) is the information provided as a public service?
b) is the information free of advertising?

4. Currency:
   I. Are there dates on the page to indicate:
      a) when the page was written?
      b) when the page was first placed on the web?
      c) when the page was last revised?
   II. are there any other indications that the material is kept current?
   III. If materials is presented in graphs and or charts, is it clearly stated when the data was gathered?

5. Coverage:
   I. it there an indication that the page has been completed, and is not still under construction?
   II. if there is a print equivalent to the web page, is there a clear indication of whether the entire work is available on the web or only parts of it?
   III. Time: Is the information in the resource limited to certain time periods?
   Breadth: what aspects of the subject are covered?
   Depth: what is the level of detail provided about the subject? are breath and depth appropriate for the purpose and targeted audience of the resource? Purpose: what is the purpose of the resource? Is it clearly stated? Does the resource fulfill the stated purpose? The purpose needs to fit the intended audience for the resource.
   Format: does the user group at which the site is aimed have the connectivity to access the resource?

6. Uniqueness:
I. what advantages do this particular resource have? What does this source offer that others do not?
II. is the content of the resource available in other forms?
III. if the resource is derived from another format, does it have all features of the original?
Have extra features been added? Does it complement another source?

7. Access & connectivity:
I. can web users access the website easily and view the information properly- without restrictive fees and given variations of different browser technologies or software?

8. Userfriendliness & organisation:

I. Is the resource easy to use and navigate? Are any necessary special commands made clear?
II. how effectively can information be retrieved from the resource?
III. Is the resource organised in a logical manner to facilitate the location of information?
iv. is the organizational scheme appropriate(e.g. chronological for a historical resource)

9. Quality of writing:
Is the text well written? While hypertext linking and multimedia are important elements of the web, bulk of the information content on the web still lies in text, and quality of writing is important for the content to be communicated clearly.

10. Graphic and multimedia design

I. is the resource interesting to look at?
II do the visual effects enhance the resource, if the audio video, virtual reality modelling, or there effects used, are they appropriate to the purpose of source? In this way, the resources which are evaluated on the measures and criteria that have been stated above are most useful to the users.

CONCLUSION & SUGGESTION

Internet is the ideal solution to the developing countries information needs. The vast resources and services of the internet is very particularly for the developing countries as the printed materials i.e. information sources are expensive and are not easily available in time. The present author suggests the following to improve awareness among the users:

1. Formal training on how to browse from the internet and online sources
2. More workshop, seminars and short-term training programs are required to be organized in order to promote and develop internet services.
3. In IT oriented Orientation Courses part of the curriculum may be centred on step by step of browsing and conducting search strategy and how to filter the information may be included.
4. Day to Day activities of the Librarian in a Library must be cantered on the quality of internet information sources.

Internet potential should be fully exploited to derive maximum benefit from the world wide network based resources and services by all types of user.

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Literature on Online Information Retrieval: A Bibliometric Study

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ABSTRACT

This paper deals with the bibliometric study on Online Information Retrieval. The aim of this study was to identify country, language, form, year wise distribution and ranking of authors and journals. Data was collected from two volumes of LISA (Library and Information Science Abstracts) for the year- 2004-2005. The study reveals that USA has contributed highest number of papers, and English was the most dominant language. Most productive Journal was 'Information World Review' and maximum number of article were published in 2004 with 594 items.

Keywords: Online information, Retrieval Literature, Bibliometric,

INTRODUCTION:

Online Information Retrieval (or online searching) is thee acquisition of information from a distant computer via a terminal or PC, involving an interactive dialogue between a computer and enquirer. Thee computer handles a number of databases stored in electronic form, consisting of references to journal, articles, conferences papers, reports, books etc., which the information retrieval services (IRS) or (host) makes available to interested parties such as University Libraries, on a commercial basis. The computer matches any input search terms against its files and displays any resulting matches, which can then be printed out or download by the searcher. The choice of database depends on search topic. If, for example, the student is interested in thee chemical aspects of a dielectric material he might choose to access the online version of CAS (Chemical Abstracts Services.)

BIBLIOMETRIC STUDY:

This is the era of information explosion. Every time a new information comes. Due to rapid growth of information, a library faces so many problems in acquisition, collection, selection and organization of relevant documents within limited financial assistance and resources. To overcome these problems they need some techniques by which they can use the limited financial resources to the optimum, one of these techniques is Bibliometrics.

Bibliometrics is a quantitative study based on statistical and mathematical methods. This study is helpful in management of scientific literature measuring the utility of periodicals and relationship between journals and subject area and also in knowing the most productive contribution in a given field. Therefore, to overcome the above problems there is need for such type of study i.e. Bibliometires study.

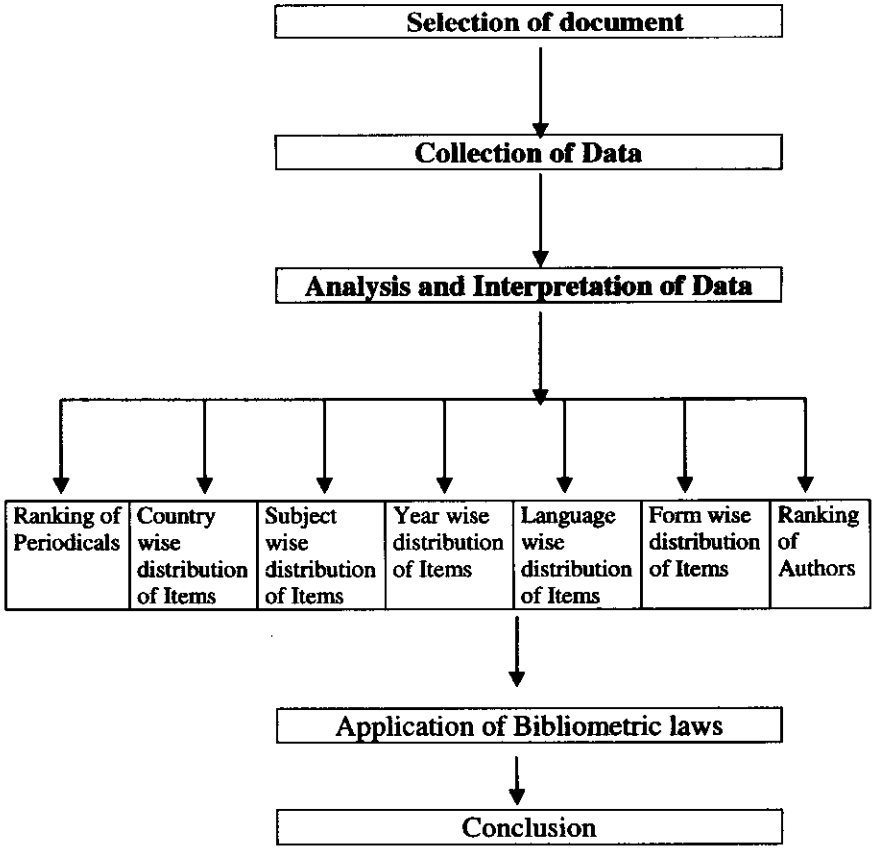
OBJECTIVES:

Before starting any study, the objective of the study should be kept in mind by the researcher. The present study aims to identification and describing some of the characteristics of literature published in the field of online Information Retrieval over the period of 2 years 2004-2005 with the view of identifying the place, language, year, subject, forms of documents country of origin, from where the documents is published. More precisely the main objectives of the present study are:

- To know the most productive country in the field of Online Information Retrieval
- To know the language in which the most of literature on the subject has been published
- To know the eminent authors in the filed of Online Information Retrieval.
- To know the rate off collaborative research
- To identify the scattering of subjects
- To prepare a ranked list of journals and to find out the core journals in the field of Online Information Retrieval
- To find out chronological distribution of items

METHODOLOGY:

Research in any area calls the systematic methodologies. The methodology for conducting the bibliometric study can be diagrammatically presented in the following ways:



Data Analysis Interpretation and Representation:

In this study two volumes of LISA (Library and Information Science Abstracts)
For the year- 2004-2005 were consulted for collecting the required data on thee topics, Online Information Retrieval, the two volumes covered 1491 items on thee Subject. The data, so collected was analyzed as follows:

Subject wise distribution:

According to the Law of scattering as explained earlier, most of the material on a given subject appears in certain core journals. However, a significant amount of Literature of published in the journals of other related or marginal subject. The analysis pertaining to subject use distribution of items has been done on the basis to subject and field of the journal, in which the literature on subject is published. To find out the subject field of journals "Ulrich International Periodicals Directory, 42nd edition" has been consulted.

The table shows that the total number of 1491 items appearing in 215 journals, which belong to 14 different subjects. Thee most dominant subject area was Networks in which 684 items contributed 45.87%.The second Rank goes to Searching in which 382 items contributes 25.62%. The third rank goes to Economic aspect –Information Industry. In which 75 items constitutes 5.03%.

Table: 1

S. No.	Rank	Subject Area	Frequency Occurrence	Frequency %	Cumulative Frequency
	1.	Networks	684	45.87	45.87
	2.	Searching	382	25.62	71.49
	3.	Economic aspects information Industry	75	5.03	76.52
	4.	Online Information	66	4.42	80.94
	5.	Information Services	57	3.82	84.76
	6.	User training	39	2.61	87.37
	7.	Computer Application	34	2.28	89.65
	8.	Database	28	1.87	91.52
	8	Online health information	28	1.87	93.39
	9.	Electronic Resources	27	1.81	95.02
	10.	Electronic Publications	25	1.67	96.87
	11.	Virtual Library	19	1.27	98.14
	12.	Online information works	18	1.20	99.34
	13.	Information Communications	9	0.60	99.94
		Total	**1491**	**99.947**	

Form wise Distribution of Items

The analysis of Table No.2 shows that the literature on this subject is published only in on form. It is evident from the data that 1491 items constituting 100 % of the total data was published in the form of Articles. This may be consulted that the Articles published in journals are most vital forms of media of communication among scientists belonging to the subject **"Online Information Retrieval"**.

Table: 2

S.No.	Rank	Subject Area	Frequency Occurrence	Frequency %	Cumulative Frequency
1	1	Articles	1491	100	100%

Year wise Distribution:

This study is useful in knowing the currency of information in the secondary sources. It may also be useful to know the most productive year of the Literature on **Online Information Retrieval**. The Information about the period of origin can be easily find out thee its bibliographical Information. As, mentioned two volumes of LISA 2004-2005 were taken to collect data on Online Information Retrieval.

Table 3 shows the Chronological scattering of all literature on Online Information Retrieval analysis shows that 30.18% literature on the subject were published in 2005, 39383% in 2004, 24.07% in 2003.

Table-3

S.No.	Period	Total Frequency	% Frequency	Cumulative % Frequency
1	2005	450	30.18	30.18
2	2004	594	39.83	70.01
3	2003	359	24.07	94.08
4	2002	54	3.64	97.72
5	2001	28	1.87	99.59
6	2000	6	0.40	99.99

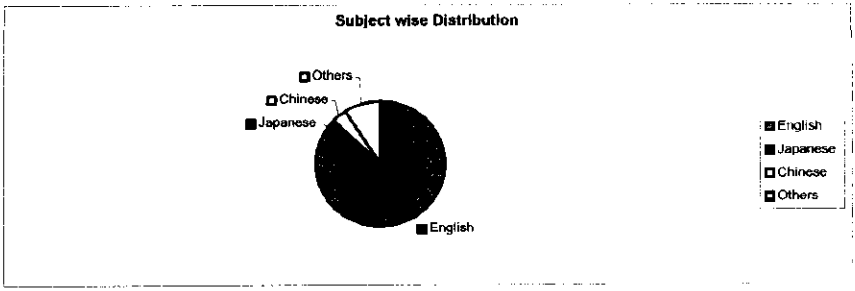
Language wise Distribution

It is always useful for the researchers to know the language in which materials in their areas of specialization is published. This type of study provides information about the most dominant language or languages in which the literature on the subject **Online Information Retrieval** is being produced.

Below table shows that distribution of Items according to the language of their publication out of a total 1491 items 1230(82.49%) were published in English Language. The second and Third rank goes to Japanese and Chinese with 61 (4.09) and 56 (3.75) besides contributions of other languages are about 134 (8.98) of the total Items.

Table-4

S.No.	Rank	Subject Area	Frequency Occurrence	Frequency %	Cumulative Frequency
1	1	English	1230	82.49	82.49
2	2	Japanese	61	4.09	86.58
3	3	Chinese	56	3.75	90.33
4	4	Others	134	8.98	99.31

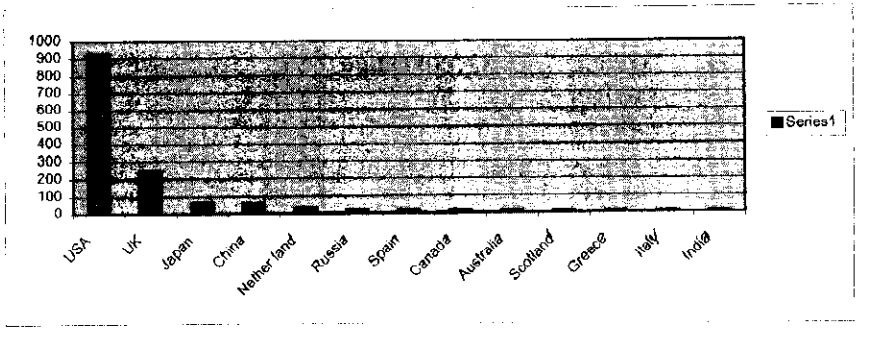


Geographical Distribution

Below Table shows list of Countries according to their rank. It was observed that 62.37% o f total no. of journals were published from USA, UK and Japan produce 16.36% and 4.09% respectively. It was found that literature output of USA accounted for 930 of total items.

Table-5

S.No.	Rank	Name of Country	Frequency	%
1	1	USA	930	62.37
2	2	UK	244	16.36
3	3	Japan	61	4.09
4	4	China	56	3.75
5	5	Nether land	33	2.21
6	6	Russia	19	1.27
7	6	Spain	19	1.27
8	7	Canada	16	1.07
9	8	Australia	15	1.00
10	9	Scotland	10	0.67
11	9	Greece	10	0.67
12	10	Italy	9	0.60
13	10	India	9	0.60
		Total	**1491**	



Ranking of Journals:

In the collected data of all the 1491 references were found to be in 215 Journals, which have been ranked on the basis of their decreasing frequency. Only up to 10^{th}

In this study the first rank was occupied by the Journal titled **'Information World Review'** with the frequency of 106 which accounts for 7.10% of the total references. Next to the positions are occupied by Journallike **'Journal of American Society for Information Science and Technology'** with the frequency 86, which accounts for 5.76% and **Advance Technology Libraries** with the frequency 69, which about 4.62% of the total references.

Table-6

S. No.	Rank	Name of the Journals	Place	Frequency	Cumulative Frequency
1	1	Information World Review	USA	106	106
2	2	Journal of American Society for Information Science and Technology	USA	86	192
3	3	Advance Technology Libraries	USA	69	261
4	4	Searcher	USA	59	320
5	5	Information Today	USA	48	368
6	6	Journal of the China Society for Scientific and Technical Information.	China	44	412
7	7	Online	USA	43	455
8	8	Assignation	UK	37	492
9	9	Medicine on Net	USA	34	526
10	10	Journals of Information processing & Management	Japan	30	556

Ranking of Authors:

Table-7

S. No.	Rank	Name of Authors	Frequency %	Cumulative Frequency
1.	1	Chilling Worth, M	30	30
2.	2	Grogg, J.E.	22	52
3.	3	Dickering, B	20	72

4.	3	Marfleet, J	20	92
5.	4	Wikgren, M	15	107
6.	5	Leech, H	14	121
7.	5	Lampert, L.O.	14	135
8.	6	Leroy, G.	13	148
9.	6	McDermott, I.E.	13	161
10.	6	Mark Land, M	13	174
11.	7	Karhula, P	12	186
12.	7	Linceeum, M	12	198
13.	7	Alper, B.S.	12	210

Application of Bradford's Law:

This law states that if scientific periodicals are arranged in order of decreasing productivity of articles on a given subject they may be divided into a nucleus, of periodicals more particularly developed to the subject and several groups, or zones containing when the number of periodical in the nucleus and succeeding zones will begin as:

1: n: n2

Where '1' is the number of periodicals in the nucleus and 'n' is a multiplier. To check the validity of this law 215 periodical were divided into 3 zones according to their productivity. In first zone 8 journals contained 492 items. In second zone, 33 journals contained 499 items and remaining 174 Journals contained 500 items in third zone. Three zones thus identified will form an approximately geometric series as given below:

8: 33: 174

33 = 32 = 8 X 4 (Approx)

174 = 128 = 8 X 4 X 4 (Approx)

Therefore, now the series is:

8: 8X4: 8X4X4

on substituting 4 = n

8: 8n: $8n^2$

Thus bradford's law is proved.

Below table shows here only first and second zone:

Table 8

S.No.	Number of Journals	Cumulative No. of Journals	No. of Items	Cumulative no. of Items
1.	1	1.	106	106
2.	1	2.	86	192

3.	1	3.	69	261
4.	1	4.	59	320
5.	1	5.	48	368
6.	1	6.	44	412
7.	1	7.	43	155
8.	1	8.	37	492
Total	**8**	**Total**	**492**	
9.	1	9.	34	526
10.	1	10.	30	556
11.	1	11.	27	583
12.	1	12.	25	608
13.	1	13.	23	631
14.	1	14.	20	651
15.	1	15.	20	671
16.	1	16.	19	690
17.	1	17.	19	709
18.	1	18.	19	728
19.	1	19.	18	746
20.	1	20.	17	763
21.	1	21.	16	779
22.	1	22.	15	794
23.	1	23.	15	809
24.	1	24.	14	823
25.	1	25.	13	836
26.	1	26.	13	862
27.	1	27.	12	874
28.	1	28.	12	886
29.	1	29.	11	897
30.	1	30.	10	907
31.	1	31.	10	917
32.	1	32.	10	927
33.	1	33.	10	937
34.	1	34.	9	946
35.	1	35.	9	955
36.	1	36.	9	964
37.	1	37.	8	972
38.	1	38.	8	980
39.	1	39.	8	988
40.	1	40.	8	996
41.	1	41.	8	1004

Conclusion and Implication

The prime objective of the Bibliometric Study i.e. quantitative or numerical or statistical analysis of recorded communication is to know the subjects, forms, contributors, languages, countries, and years, leading core journals etc. in the subject "Online Information Retrieval". After the collection of data from 'LISA' (Library and Information Science

Abstract), it was analyzed according to bibliometric technique and results were drawn in the form of table pie chart and graphs. At last Bradfor's and Lotka"s laws were tested comprehensively. On the basis of this study major findings may be concluded as follows:

1. The Subject description analysis shows the scattering of subject i.e. due to explosion of knowledge and new subjects were developed and that may lead to scattering of subjects. The most dominant subject field in which literature on "Online Information Retrieval" was produced is 'Networks' with 684 items i.e. "Searching 382 items, i.e. 25.62% 'Economic Aspect into Industry' with 75 items 5.03 ' Online Information' with 66 items i.e. 4.42%.

2. From the form wise distribution it is found that 'Articles' are the most popular form it is evident from the data, 1491 items contribute 100% of total literature is published the form of articles. From the form wise distribution, it is found that Article are to most popular form, it is evident from the data that 1491 items contribution 100% of total data is published in the form of articles.

3. In author wise analysis, it is found that 912 items i.e 61.17 % were written by single authors and 579 items 38.83% were written by more than one authors the most productive authors in this field of "Online Information Retrieval".
   a) Chillingworth, M
   b) Grogg, J E
   c) Pickering, B

4. Language wise distribution analysis shows that 82.49% literature is this field is published in English Language, 4.09% in Japanese 3.75% in Chinese English is the most dominant language in this field. This analysis suggested that researchers should know atleast one foreign language other than English.

5. From geographical study, it was found that USA is the biggest producer of new literary warrant in the field of "Online Information Retrieval". It accounts for 60.56% of the total literature, the second and third leading countries include UK (16.36%) and Japan (4.09%).

6. From the study dealing in the year wise distribution of items, it is found that the largest amount of document were produced in the year 2004 with 594 items i.e. 39.83% on the subject " Online Information Retrieval." The author most productive years are 2005 and 2003.

7. From the table No. 7, it was found that the journal title "Information World Review" published from USA is most productive, reporting 106 items i.e. 7.10% of the total, followed by "Journal of the American Society for Information Science & Technology "published from USA with 86(5.76%) items and "Advanced Technology Library" with 69(4.62) items. The information of core journal in various subjects will go a long way in preparing the subscription list of journals by the librarian and information scientist.
8. At last Braford's law was applied to the collected data to testify the validity of laws in the present context.
9. Finally, it may be concluded that Bibliometric study is very well established technique of identification and describing some characteristic of literature. This study will help the librarian or information scientists in making subscription and taking certain fruitful steps in the smooth functioning of library and also will help in satisfying the need of the users to a great extent. Now a days bibliometic studies are becoming very popular because of explosion of the knowledge.

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Scholastic Use of Internet by Business School Students of Orissa: A Survey

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ABSTRACT

Evaluates the students' use patterns of internet in the academic setting of business schools in Orissa (India) and examines the current trends in locating and accessing information on the internet. Unfolds that students pay almost equal importance in the use of PCs and laptops, whereas, the use of palmtops is found quite negligible. Further reveals that premier search engines like, Google and Yahoo! are used by the majority of students, followed by MSN. However, there is a decreased trend in the use of other search engines likes Dogpile, Alta Vista, and Infoseek and reflects that majority of respondents use internet for accessing e-news, and searching open web. While, the use of internet for accessing OPAC and online databases is found moderate, the use of internet in accessing course specific web pages, and blogs/wikis is found quite insignificant. Succinctly unmasks some of the key problems and constraints encountered by students in accessing and using internet services with some useful recommendations for upgrading the usage of internet for effective promotion of scholastic merit. Used SPSS in data analysis.

Keywords: Web resources, Search Engines, OPACs, Blogs, Wikis, ICT.

INTRODUCTION

Internet has become a vital information resource and the most extensively used communication tool. For students, teachers and professionals, it has transformed information access, use, exchange and application in academic sphere over last few years besides influencing the patterns of communication and use of global resources and facilities. When the users can access OPACs, library databases and other resources

any where on campuses, offices, hostels, and homes, they are less likely to visit the library in person[1] and their visits to library have become passive. Therefore, it has become imperative for the library professionals to reshuffle and revamp the existing library services through precise and appropriate strategies and policies so that the resources of libraries can be digitally designed and subsequently transmitted to the academic community for the sake of their scholastic goals. The present study is an attempt in the aforesaid direction which examines the extent of use of internet by the students of business schools of Orissa (India) for accessing scholarly e-resources, highlighting problems and constraints faced by them with some useful recommendations for promoting use patterns of internet leading to academic excellence.

REVIEW OF LITERATURE

Ridzaun, et al.(2003) in their study found that the students' basic skills in the Internet and their perceptions of the learning environment were related to their use of the Internet to supplement their learning requirements. Students with better basic skills in the Internet and perceived the learning environment to be supportive of using the Internet for their learning tasks to improve their studies. [2] Mishra, et al. (2005) in their survey reported that majority of GB Pant Agricultural University students use internet. [3] Akporido (2005) in his study revealed the different personal characteristics associated with various aspects of internet use. [4] Al-Ansari (2006) in his study unfolded that internet use by a large majority of faculty members of Kuwait University are mostly focused on e-mails, search engines, and web resources exclusively for communication, research and publication. [5] Kanungo (2007), on the other hand, highlighted the purposes and frequency of use of internet by social scientists, and their methods of using information on internet at IGNOU. [6] Nikam and Pramodini (2007) in their joint study presented a succinct view on the use of internet by the users of University of Mysore unfolding the usage trend. [7] Johnson (2008) who made similar study on the internet use pattern found that extensive and appropriate use of the internet is primarily associated with an increased human capacity to reason. [8] The findings of Tan, et al (2009) suggested that internet- based ICT adoption provides a low cost yet effective communication tool for customers. [9] Swain and Panda (2009) in the process of evaluating opinions of business school librarians found that internet-based e-resources are being well used compared with CD-ROM databases. [10] However, the findings of the present study unveil some other details.

METHODOLOGY

This survey adopted quantitative method and in order to test the internet use patterns of students of business schools of Orissa (India), a predetermined sample of 200 questionnaires were personally distributed

among students of 20 business schools of Orissa at their respective schools with an average of 10 questions per each school and a total number of 192 filled in questionnaires, with a high response rate of 96% were collected. The gathered data was processed through SPSS package for cross tabulation, analysis. The vivid interpretations of the data are depicted below:

TYPE OF ICT DEVICES USED FOR INTERNET ACCESS

Students access electronic information via internet through ICT devices in the form of personal computers, laptops, and palmtops for supplementing their academic and research pursuits as well as for improving their knowledge and experiences. Thus, it is vital to understand the extent to which the users of business school libraries in Orissa are accustomed with the use of such ICT devices. The views of the respondents relating to this question are depicted in Table I.

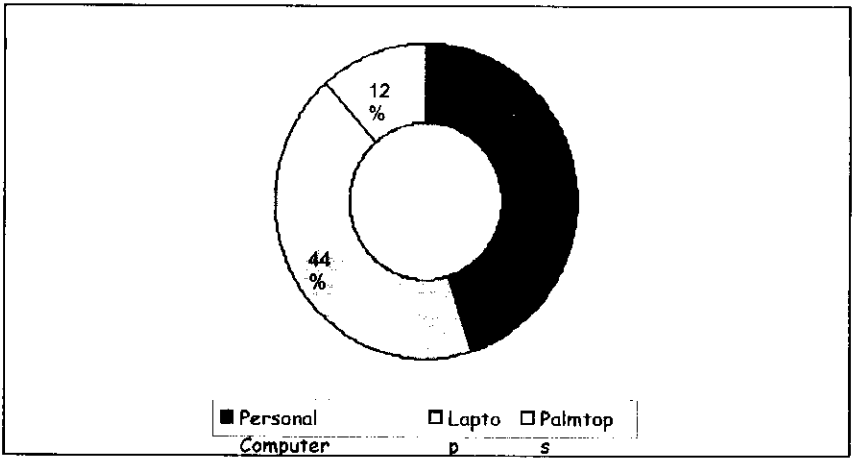
Table I type of ICT devices used for internet access

				Gender			
				Male		Female	
Type	Yes/No	N	%	N	%	N	%
Personal Computer	Yes	105	54.7	74	72.1	31	42.5
	No	87	45.3	45	37.8	42	57.5
	Total	192	100	119	100	73	100
	Pearson Chi-Square			$\chi^2 = 7.473$*		p =.024	
Laptop	Yes	102	53.1	46	38.7	17	23.3
	No	90	46.9	73	61.3	56	76.7
	Total	192	100	119	100	73	100
	Pearson Chi-Square			$\chi^2 = 26.314$*		p =.000	
Palmtop	Yes	27	14.1	17	14.3	10	13.7
	No	165	85.9	102	85.7	63	86.3
	Total	192	100	119	100	73	100
	Pearson Chi-Square			$\chi^2 = .013$		p =.910	

* Significant at 0.5 level

Chi-square output ($p<0.05$) in Table I shows that there is significant difference in the opinions of males and females with regard to use of personal computers and laptops. However, the overall data reveal that students pay almost equal importance towards the use of personal computers (54.7%) and laptops (53.1%), whereas the use of palmtops (14.1%) was found quite negligible (Fig 1). Thus, it provides considerable evidence that palmtops have failed in execution of scholarly use of internet by the users of business school libraries in Orissa.

Fig 1 use of type of ICT devices



INTERNET ACCESS AT DIFFERENT VENUES

Students prefer to access internet at different spots owing to their privacies and relative convenience in accessing academic information. The opinions of the respondents regarding use of internet at different venues are presented in Table II.

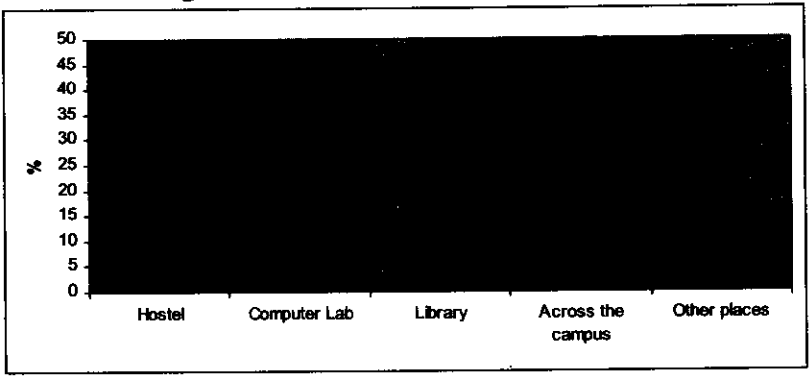
Table II Internet access at different venues

				Gender			
				Male		Female	
Places	Yes/No	N	%	N	%	N	%
Hostel	Yes	55	28.6	25	21	30	41.1
	No	137	71.4	94	79	43	58.9
	Total	192	100	119	100	73	100
Computer lab	Yes	86	44.8	46	38.7	40	54.8
	No	106	55.2	73	61.3	33	45.2
	Total	192	100	119	100	73	100
Library	Yes	69	35.9	41	34.5	28	38.4
	No	123	64.1	78	65.5	45	61.6
	Total	192	100	119	100	73	100
Across the campus	Yes	81	42.2	56	47.1	25	34.2
	No	111	57.8	63	52.9	48	65.8
	Total	192	100	119	100	73	100
Other places	Yes	14	7.3	9	7.6	05	6.8
	No	178	92.7	110	92.4	68	93.2
	Total	192	100	119	100	73	100

Table II (Fig 2) reveals that a good number of students access internet in computer labs (44.8%), followed by 'across the campus' (42.2%)

through laptops, and libraries (35.9%), while, use of internet in other different places is found quite negligible (7.3%). It is evident that students could be using laptops via Wi-Fi internet network at their preferred places. Cross sectional analysis reveals that the use of internet across the campus is found more among the male respondents (47.1%) compared to their female counterparts may be due their extra roaming characteristics. Concomitantly, use of internet in computer labs is observed more among the female respondents (54.8%) than male respondents (38.7%). Therefore, it is inferred that personal choices matter quite substantially in use of internet at various places.

Fig 2 Internet access at different venues



TIME SPENT ON USE OF INTERNET

The respondents were further asked, "what amount of time do you spend daily for the use of internet on an average?' The answers to this query are depicted in Table III.

Table III Time spent in use of internet

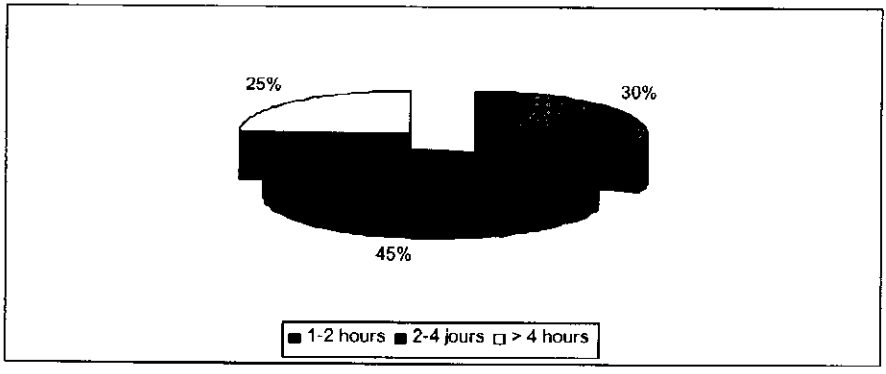
Time spent	N	%	Gender			
			Male		Female	
			N	%	N	%
1-2 hrs	55	28.6	43	36.1	12	16.4
2-4 hrs	91	47.4	58	48.7	33	45.2
> 4 hrs	46	24	18	15.1	28	38.4
Total	192	100	119	100	73	100
Pearson Chi-Square				χ^2 =16.437*		p =.000

* Significant at 0.5 level

Table III (Fig 3) depicts that less than half of the total respondents (47.4%) spend, on an average, 2-4 hours on use of internet. At the same time 29.6% of respondents, seemingly day scholars, spend 1-2 hours.

However, only 24% of respondents who are presumably hostel students, express that they use internet more than 4 hours. It is implied that day scholars might be hardly finding time for using internet during college hours, may be they are losing a valuable chunk of their time in their journey to attend their classes. The overall analysis indicates that the aggregate internet use by the students' community as a whole needs to be further enhanced.

Fig 3 Time spent on use of internet



FREQUENCY OF USE OF INTERNET

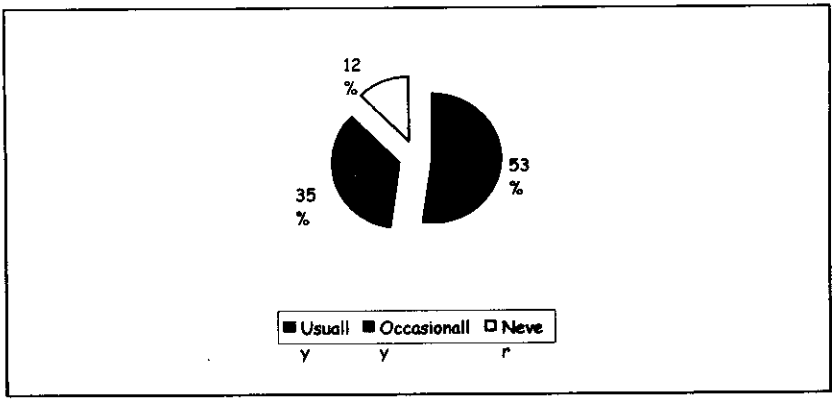
The respondents were asked to mention the frequency of use of internet; as such a study often reveals the web-love attitude of a user, but also the potentiality of the user and his necessity in browsing. Their views relating to such question are presented in Table IV for analysis.

Table IV Frequency of use of internet

Frequency of use			Gender			
			Male		Female	
	N	%	N	%	N	%
Usually	100	52.1	55	46.2	45	61.6
Occasionally	68	35.5	49	41.2	19	26
Never	24	12.5	15	12.6	9	12.3
Total	192	100	119	100	73	100

It is understood from Table IV that more than half of the total respondents (52.1%) use internet usually, and 35% of respondents use occasionally. Concurrently, only 12.5% of the total respondents are found to be not at all using internet (Fig 4), which is quite insignificant. Thus, it is implied that still there are some students who are yet to rely on the credibility of web resources or they are reluctant to use internet because of their lack of exposure to cyber world communications.

Fig 4 Frequency of use of internet



USE OF SEARCH ENGINES

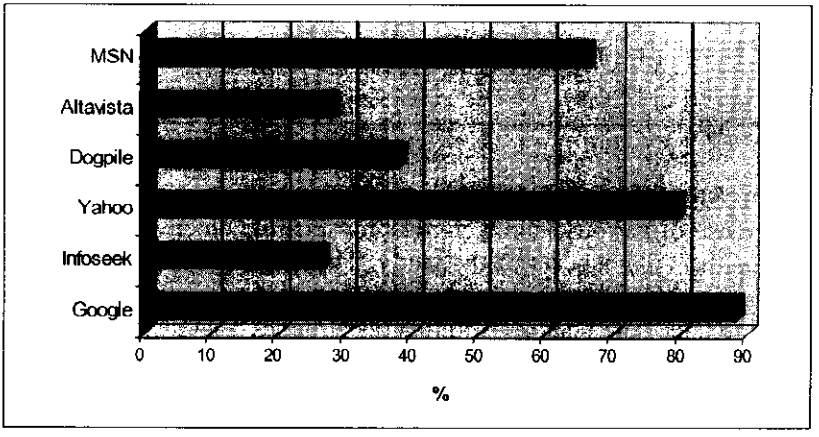
Relative use of various search engines for locating electronic information is one of the vital aspects of the study. The respondents, therefore, were asked to express their views as to what extent they make use of various search engines. The responses to this question are succinctly presented in Table V for a view.

Table V Use of search engines

Purpose of use	Yes/No	N	%	Gender			
				Male		Female	
				N	%	N	%
Google	Yes	170	88.5	103	86.6	67	91.8
	No	22	11.5	16	13.4	6	8.2
	Total	192	100	119	100	73	100
Infoseek	Yes	51	26.6	26	21.8	25	34.2
	No	141	73.4	93	78.2	48	65.8
	Total	192	100	119	100	73	100
Yahoo!	Yes	153	79.7	96	80.7	57	78.1
	No	39	20.3	23	19.3	16	21.9
	Total	192	100	119	100	73	100
Dogpile	Yes	73	38	41	34.5	57	78.1
	No	119	62	78	65.5	16	21.9
	Total	192	100	119	100	73	100
Alta Vista	Yes	54	28.1	23	19.3	47	64.4
	No	138	71.9	96	80.7	26	35.6
	Total	192	100	119	100	73	100
MSN	Yes	127	66.1	80	67.2	47	64.4
	No	65	33.9	39	32.8	26	35.6
	Total	192	100	119	100	73	100

It is understood from Table V (Fig 5) that premier search engines like Google (88.2%), and Yahoo! (79.7%) are used by the majority of students, followed by MSN (66.1%). However, there is a decreasing trend in the use of other search engines like, Dogpile (38%), Alta Vista (28.1%), Infoseek (26.6%). This signifies that there is a great tendency among the students of business schools towards the use of premier web searching option Google, may be due to its wide coverage and comprehensiveness.

Fig 5 Use of search engines



SPECIFIC USE OF INTERNET-BASED RESOURCES

The paradigm shift from print to electronic modes has contributed towards enormous digital reading in the academic scenario. Since the purpose of use of internet varies from person to person, the respondents were asked to express their opinions on specific use of various scholarly internet resources. The answers to which are depicted in Table VI (Fig 6).

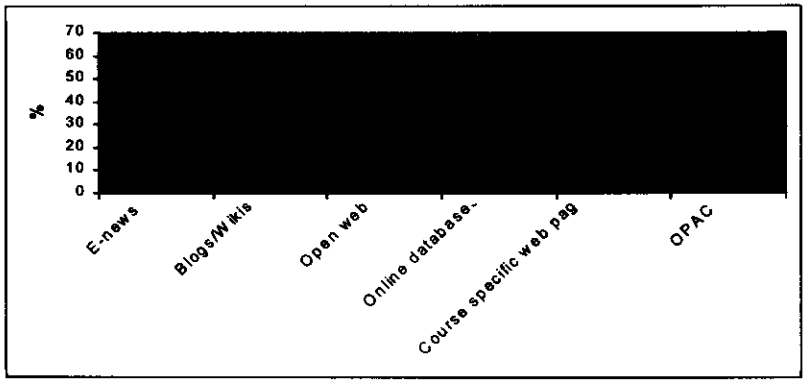
Table VI Specific use of internet-based resources

Purpose of use	Yes/No	N	%	Gender			
				Male		Female	
				N	%	N	%
E-news	Yes	122	63.5	70	58.8	57	71.2
	No	70	36.5	49	41.2	21	28.8
	Total	192	100	119	100	73	100
Blogs/ wikis	Yes	57	29.7	29	24.4	28	38.4
	No	135	70.3	90	75.6	45	61.6
	Total	192	100	119	100	73	100
Searching open web	Yes	117	60.9	75	63	42	57.5
	No	75	39.1	44	37	31	42.5
	Total	192	100	119	100	73	100

Using online databases	Yes	89	46.4	58	48.7	31	42.5
	No	103	53.6	61	51.3	42	57.5
	Total	192	100	119	100	73	100
Course specific web pages	Yes	60	31.3	32	26.9	28	38.4
	No	132	68.8	87	73.1	45	61.6
	Total	192	100	119	100	73	100
Using OPAC	Yes	95	48	51	42.9	40	54.8
	No	96	52	68	57.1	33	45.2
	Total	192	100	119	100	73	100

Table VI shows that majority of respondents use internet for accessing e-news (63.5%) and searching open web (60.9%) respectively. Concurrently, it is found that there is a moderate use of internet for accessing OPAC (48%) and online databases (46.4%). However, use of internet for accessing course specific web pages (31.3%), and blogs/ wikis (29.7%) is found minimum (Fig 6). It is further evident that either the students of business schools of Orissa are not able to explore the potential resources of course specific web pages available through internet or librarians of respective business schools have not yet taken proper initiatives for developing and maintaining course specific web pages that need to be implemented.

Fig 6 internet-based resources



CONCLUSION

Internet today is regarded as the hub of all activities of any educational institution due to the evolution of electronic libraries congruent with the prolific revolution of ICT. Contextually, use patterns of internet is noticeably influenced by its operability, compatibility, flexibility, time saving utility, usefulness, comprehensiveness, productivity, security and such other issues which pretext a challenge before the information professionals of electronic age for successful delivery of library services via internet. In comprehending the changing landscape of information,

the librarians' community is impelled with the idea of designing subject specific web pages and its subsequent appraisal to students' community through ample training and information literacy programs for ensuring handy use of internet. In this context, the authors feel that in an ideal academic setting, the internet access speed should be enhanced to the desirable level. Moreover, institute directors and system managers should take appropriate protective measures like installation of fire walls, qualitative anti-viruses and anti-spy wares, blocking up unwanted and illegal sites, and putting download restrictions per individual student in the wake of providing 24/7 fast, safe, and uninterrupted internet services as a result of which the patterns of internet use reflected in the findings of the survey can be further enhanced for sustaining academic excellence of the business schools of the state and country as well, by being a role model for analogous academic setting in other different parts of the world to follow suit.

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Subject Gateways and their Utilities

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INTRODUCTION

Throughout the last few years of Internet development we have, however, experienced both the need and the difficulty of doing so because of the fact that so many different communities are participating in common developments and discussions and that some people come even from outside traditional research communities. It necessary to make an effort to define the concept of subject gateways used, since this term is not established and the type of service not yet frequently occurring. Instances of this kind of service are not always generally perceived as belonging to the same type of Internet service.

The authors want provide the overview of existing subject gateways in this article focusing on factual descriptions of the main characteristics. In addition, a kind of typology is presented which could be useful in understanding the breadth of alternative approaches and in distinguishing between different variants of gateways. This overview cannot be more than a cursory examination, since two factors lead to more variations. First, the number of similar services seems to be growing quickly at the moment. Additionally, existing services themselves are changing frequently regarding scope, coverage and content, methods and features.

On Defining Subject Gateways

In the following, we will try to propose and discuss some important elements in defining the concept of subject gateways, mainly derived from existing services. Subject gateways are Internet services which support systematic resource discovery. They provide links to resources (documents, objects, sites or services), predominantly accessible via the Internet. The service is based on resource description. Browsing access to the resources via a subject structure is an important feature. A subject gateway is an Internet service with a primary focus on distributed, Internet resources. It can, however, include surrogates to resources not

directly accessible on the Internet. A directory or index of purely local resources should not be called a gateway. Nor, despite the high level of quality control, is it appropriate to call library catalogues (OPACs) containing a smaller or larger number of Internet resources ``subject gateways", since they list mainly local and physical resources. The subject gateway is based on resource description, but does not necessarily have to display all of it (cf. quality controlled gateways below).

It is necessary to mention a couple of aspects which, to my mind, are not to be used as elements in the definition of subject gateways: the scope of the service, which is predominantly the research, learning and cultural sectors; coverage of the service; the granularity, site or page level, of the selected resources; architecture and technical solutions; sources of funding, for example, public sector or commercial; or if the gateway takes a preservation role for the resources described.

The definition of subject gateways is deliberately kept very open. There is a need for a term for each kind of service: (1) the link lists with minimal description and shallow subject, structure, here called subject gateways (cf. above); and (2) the subject services with high standards for quality control and with rich description and structure, here called quality-controlled subject gateways. Among quality-controlled gateways certain types might evolve as defined by a specific combination of different quality measures. Or we might see a continuum of services, from those applying only one quality characteristic to services optimizing all of them. Practical considerations will decide where the boundary zones between these different quality levels run.

The following characteristics can be used to define a ``quality-controlled subject gateway": (1) Creation: considerable manual creation or intervention efforts will be applied. These are carried out by editors and information and/or subject specialists, to ensure quality levels and coherence of the service. This is especially important for the selection and content description of the resources. (2) Collection development: a policy based on published selection criteria focusing on the quality of the resources to be included would be beneficial. This selection is normally an intellectual process. A quality gateway will strive for ``completeness" and balance (for example, by topic, by geographical representation, by document type) based on this policy. (3) Collection management: a policy for maintenance of the collection should guarantee currency through record checking for content changes, regular updates to the collection, link checking, weeding. (4) Resource description/metadata: quality indicators are: a rich set of quality metadata for the individual resources; the display of a large part of these metadata; compliance to a metadata standard; a formalized, coherent level and style of the content description (annotation, summary, abstract, review). (5) Subject access: the use of deeper levels of classification for the subject/browsing

structure of the service is one of the most important criteria for a quality-controlled subject gateway; criteria are also the use of keywords or better controlled vocabularies (e.g. subject heading systems, thesauri) for subject indexing of the resources and a more or less advanced and integrated search and browse access. (6) Standards: the application of open standards to allow interoperability with other services indicates a quality gateway. (7) Value-adding features (e.g. regarding display and usage features): contribute to the quality, too. The criteria cover both quality control of the individual resources included in the gateway and features to judge the level of quality of the whole service. It will probably be harder to reach high quality levels by applying only automated methods of metadata creation; some manual evaluation is necessary. Loosely structured lists of links might be covered by the term subject gateway, but they certainly are not quality-controlled subject gateways. It is hardly imaginable that many of these quality features can be offered in a sustainable way by a single individual. Creation, collection development, and resource description (1, 2 and 4 above) might be considered weak areas for many directories of Yahoo! type or the ones normally connected to big search ``engines", whereas collection development, collection management, subject access, and value adding features (2, 3, 5 and 7 above) are usually the primary shortcomings of private collections of linklists.

Overview of characteristics and solutions

The goal for this part of the article is to provide an understanding of the variety of approaches and solutions used in existing subject gateways. To accomplish this, we will try to provide an initial, empirical overview of existing quality-controlled subject gateways by giving a practical description of their main characteristics and solutions. Investigations in general are very time consuming. In addition, these gateways are not a stable and well-defined group of services, plus new candidate services are appearing all the time. These new discovery services are often hard to discover themselves. Therefore, it is not currently possible to mention more than a few selected approaches and features from a limited number of quality gateways, especially since these services are comprehensive and are changing frequently regarding scope, coverage, content, methods and features. A large part of the information presented here is based on a survey of ``quality resource discovery systems" outside the UK carried out by John Kirriemuir for the Resource Discovery Network Center in summer 1999. In addition to the quality criteria mentioned above, Kirriemuir used the following two practical rules to decide which services among the 141 identified candidates to include among the (final 39) quality gateways: at least part of the gateway's content had to be in English; and the service should present a significant number of resources, at least a few hundred. A list of about 50 quality-controlled subject gateways is provided at the end of this article, representing Kirriemuir's selection with a couple of additions. Most of the examples mentioned are taken from the services in this list.

The quality-controlled subject gateways are so far almost exclusively developed by libraries, academic and educational institutions or closely related agencies and, to a surprisingly large extent, by individuals from academia. In some instances, government agencies are getting involved together with educational institutions (for example, EdNA, AgDB, GEM). A few commercial providers are known (for example, OCLC's CORC, Internet Library for Librarians, Edward Lowe Foundation, Polylinks, Ei Village. These, however, address the same target user groups as the others: the academic and educational sectors on a local, national or global level. There are still clear geographic centres of activity where most of the subject gateways are developed and published: the UK, the USA (with many individual, isolated efforts), the Nordic countries, The Netherlands, Germany and Australia. Many services from the non-English speaking world publish the gateway content in English as well, addressing a regional or global audience or international members of local academia. In the Nordic countries, a couple of services publish in their local language. Multilingual gateways are very rare and exclusively a combination of the local language and English. Certainly, the vast majority of the resources described in the services are published in English. A couple of services, however, include foreign language resources which are described in the gateway's primary language. As far as resource types are concerned, full text documents, organizational home pages, link lists and services in the public domain are predominant. In contrast, commercial material (e.g. pointed to in EEVL), software and multimedia documents or physical objects (apart from books and journals), which are represented in the few arts and humanities services, are clearly underrepresented. HTML is the predominant file format of the described resources; other text and image formats occur to a minor degree. There has been a lot of debate about the granularity of resources to include. Quite a number of services limit themselves to the site, service and collection level (for example, Envirolink, Human Language Page, NOVAGate). This makes a lot of sense (because the service can be kept smaller with fewer changes in total) but poses more problems regarding metadata description and subject access. The large majority of services show a mixed granularity.

Two size groups are readily apparent: a group of smaller gateways ranging from a few hundred to about 2,000 resources and a group of large gateways describing between 5,000 and 10,000 resources. The largest examples of the latter are: BUBL Link, EdNA Online, Scout Report Signpost, Cyburbia, SOSIG and GEM. An exception is OCLC's CORC which contains more than 200,000 records. CORC has to be seen as a treasury of catalogued Internet resources, intended to be used for subject gateways and other services, rather than a single coherent qualitycontrolled subject gateway itself. Monthly growth rates range from 1 per cent (for example, Not just cows, World Lecture Hall,

TIPTOP) to between 7 and 10 per cent (for example, Elki, SocioSite, Envirolink), except for services in a start-up or sudden expansion phase.

Coverage has been described in the typology section above. However, it is important to mention here that global geographic coverage is predominant, with a minor group of services focusing on national resources. Quite a lot of the minor US and some Nordic and Australian gateways are of the latter type. A couple of subject areas are especially well represented, such as Agriculture, Engineering, Medicine and Education, in other words applied sciences and the subject area of the educational sector (see the list of gateways below for examples). Agriculture might be the subject closest to reaching true global co-operation between gateways. Natural and social sciences are covered by a number of services, too. The few investigations known show a surprisingly low level of duplication between gateways. Most services do not display scope and coverage descriptions despite the fact that there are probably internal scope policies and documents available. All gateways on the list apply formulated quality criteria for the selection of resources since this is one of the main requirements for a quality-controlled subject gateway. However, not all gateways publish a selection document for inspection by the users (such documents are published by, for example, SOSIG, EELS, OMNI, EEVL, Agrigate, EdNA). In some cases the criteria are derived from the thorough work carried out in the European Union DESIRE project. Many services allow the general public to submit candidate resources for consideration. These often use specific templates to facilitate submission of candidate resources, but in the end editorial control and, in most cases, upgraded description are needed in a quality gateway. Collection management policies should consist of the following at a minimum: Regular link checking: surprisingly many services do not seem to check the links to included resources on a regular basis. Specifically, they appear not to change wrong URLs often enough, despite the availability of suitable free software for the task. (2) Check that the description of the resources, especially as to their content, is still correct: here Kirriemuir found limited awareness of the problem and an unsatisfying resource re-checking cycle. Resources are often not even re-checked once a year and very few services claim a three or six months cycle. For obvious reasons, this information is a quality factor that few want to display to their users. Some gateways seem to minimize the level of detail of their resource descriptions, thus avoiding the need for frequent updates of the description. (3) Update frequency with new resources: this was presented as monthly growth rates above. There is not much evidence of an active weeding policy, that resources are removed when better ones are discovered. The level of completeness and balance the services are capable of reaching with regard to their regional and subject coverage is largely unknown. This is generally very hard to judge and no obvious methods are available. It is even harder to do when the gateways do not display a rather deep subject/browsing structure. All services provide access to their collection through a Web interface and

most gateways offer some kind of search option. The type of searching system and indexing varies tremendously, however. The description of the resources is stored in a database or in a file system. The browsing pages are stable HTML pages created out of the database or stored in a file system, as is done in EELS, for example. Or it is created on-the-fly using Java, as is done in EEVL, or cgi-scripts. Stable pages have an advantage in that they can be harvested by robots into search services, which might be considered an important goal. All gateways using the ROADS package, such as SOSIG, Biz/ed, OMNI, ADAM, NOVAGate, EELS, The Finnish Virtual Library, store the resource metadata in a database. Other gateways, such as Cyburbia, Agrigate, EdNA and GEM, also do this. Files and static HTML pages are indexed and searched in two ways: in one method, a page contains a number of different resources and all of them are presented when doing a specific search (for example, Polylink). In the other, each resource has its own page (for example, MathGuide, GeoGuide). As far as indexing and retrieval software is concerned, low-cost or free systems are prevailing, many developed in-house. Apart from ROADS, no single package is used in more than a few implementations, the majority of which seem to be developed locally. Examples of established, free indexing systems are Glimpse, SFgate, SWISH-E and Excite. Alternative software packages to ROADS for running a subject gateway are DSTC's HotMeta product (used in MetaChem and AVEL, for example) to a certain degree, and OCLC's MANTIS and SiteSearch (which are used in CORC). New options will be developed by the common NSF-JISC project IMesh toolkit in which the ROADS developers are partners.

Metadata solution and content description The amount and type of metadata recorded about the resources vary widely as does the extent to which they are displayed when navigating the services. From the information available, we cannot tell how many gateways are applying a formal metadata standard like Dublin Core, since the official element names do not need to appear in the user interface. Most of the gateways using ROADS are using IAFA template metadata normally converted into Dublin Core (DC). DC is used in the Australian gateways (Agrigate, EdNA, MetaChem) in combination with other schemas like Admin Core, the Australian Government Locator Service, Alta Vista type of metadata, and service specific elements. To ensure consistency of description and search results, a subset of the elements is normally made mandatory. GEM and EELS are two other services using DC and displaying a rich set of metadata. In contrast, poor detail and structure of the metadata and a lack of conformity to standards will limit the possibility of cross-searching between subject gateways considerably. Editorial control over the description has been used as a criterion for quality-controlled subject gateways. Thus, services displaying descriptions submitted by users or data extracted automatically, without such control, or services where resource description is totally lacking, are not included here. Only a small minority of the gateways manages to stick to a consistent

magnitude in length and a coherent style of writing when it comes to the content description of the individual resources. Annotation, summary, abstract, review or rating (rating offered by, for example, Medical Matrix, Civil Engineering Library, MathGuide, GeoGuide) are common forms used. Very detailed descriptions are provided by the Entomology Index of Internet Resources and Scott's Botanical Links. Formalized and consistent descriptions are given in AgDB and Energy Information on the Internet for instance.

Subject Access

The assignment of high level subject categories to provide a browsing structure and/or the use of (uncontrolled) keywords to assist searching can be considered the minimum level of subject description for the content of resources. Otherwise we are not talking about quality-controlled subject gateways. Many features can increase the quality of subject access to a collection, especially a deeper classification structure and the usage of a controlled vocabulary. A group of established and large services provides a very high level of quality by using both descriptors from a thesaurus and a rather deep established library classification system. In the best of cases, it is done in an integrated way. Examples of a combination of thesaurus and classification system are as follows: EELS uses Ei's classification and thesaurus; SOSIG uses UDC classification and HASSET thesaurus; OMNI and Kuopio use NLM classification and MeSH thesaurus; ADAM changed from DDC to a home-grown classification and applies the Arts and Architecture Thesaurus/Thesaurus of Geographic Names; CORC/NetFirst uses DDC and LCSH; Signpost applies the LC classification and LCSH. Other thesaurus applications are: CAB (Agrigate), MeSH (OMNI, Kuopio, Health on the Net) and LCSH (CORC/NetFirst, Signpost). AVEL and EdNA are examples of services planning to develop their own thesaurus. Additional established classification systems used are: DDC (CORC/NetFirst, BUBL Link, Biz/ed, ADAM, Elki partly); UDC (NISS, SOSIG, Tampere Univ. VL); LC (Signpost); Nederlandse Basisclassificatie (DutchESS); AGRICOLA subject category codes (AgDB). It is very common for services to develop their own classification system, sometimes leaning towards Yahoo! categories and top levels. The pros and cons of this approach are discussed in the classification chapter of the DESIRE gateway handbook. An interesting initiative is the co-operation between CORC/OCLC and GEM to map GEM's home-grown classification structure into the DDC and, thus, open it up for much broader interoperability. The EU project DESIRE has managed to apply simple automatic classification methods to the Engineering full text resources in EELS. A classification structure to the 250,000 records in the robot-generated ``All'' Engineering Web index will be integrated into the service soon. An example of a rather deep browsing structure is EELS, whereas a flat and simple hierarchy is offered by Medical Matrix. Most of the services seem to prefer a two-level hierarchy. One or two services do not even offer a real browsing

structure, only a flat jump-in feature to a specific page, or they offer a category filter for a search. Since the Ei thesaurus and classification system are closely integrated with each other, EELS can provide seamless navigation, browsing and searching. More advanced solutions are often prevented by the rights and licensing conditions for the vocabulary systems, which are often privately owned. SOSIG shows a good example of the usage of a thesaurus as search support and ADAM offers a wide variety of browsing and searching options based on both thesauri and classification.

Added value features are not a necessary element of quality-controlled subject gateways. Such features are very typical for commercial products and search services or portals. They certainly appear in subject gateways too, where they focus on improved subject access and gateway functionality. Local document storage and archives, mirrors of remote gateways, large specialized databases in the subject area, bibliographies, directories, reference sections or services, fulltext access to documents, community creating efforts such as discussion lists, links to experts, events calendars, news, bookshops or job indexes are only a few of the examples of added-value features. EEVL, EdNA, TIPTOP (connected to a scientific society) and the commercial service Ei Village are gateways that made special efforts in this respect. Other services worth mentioning are the highly specialized services Cyburbia, EnviroLink, Polylinks, Mycological Resources on the Internet and the Plant Pathology Internet Guide Book. A special and very useful feature is the provision of a robot-generated index in the same subject field the gateway covers. ``All" Engineering is a global Engineering index combined with EELS , Health on the Net offers a large index too. EEVL harvests national resources and Philosophy in Cyberspace the resources from collaborating gateways (Hippias). The SOSIG Link Harvester Index collects information only from sites already listed and EdNA does it in a similar way. Combined searching of the quality gateway and an index is offered by EELS, EdNA, Health on the Net and Philosophy in Cyberspace.

The gateways in agriculture and the ones in engineering have shown the most initiatives for international co-operation, as have the gateways connected to ROADS and the DESIRE project. Recently, an EU project with the name Reynard has been started to investigate interoperability issues and to create an integrated service among European subject gateways at national levels. The RDN interoperability group is, for practical reasons, the most advanced initiative when it comes to thinking about the benefits and requirements of interoperability. Protocols, query languages and record syntaxes, metadata schemata, subject classification and cataloguing rules are the main areas where interoperability and standard solutions are required. The goal is, of course, to allow cross-searching and cross-browsing between gateways in the same, similar or different subject areas, across one or several languages and types of services. A coherent and seamless discovery architecture for a large

number of subject gateways is a further goal which will be quite difficult to accomplish. When it comes to cross-searching distributed gateways there are already a few demonstrators available. The WHOIS++ protocol has been used in the ROADS context for several test implementations and also by TERENA in a TF-CHIC demonstrator. WHOIS++ and the Common Indexing Protocol (CIP) will be used to provide cross-searching in the RDN. Z39.50 will also be used in RDN and has been tested by UKOLN. The Isaac network project[6] uses the LDAP protocol together with CIP. Cross-browsing between different classification systems and browsing structures is a goal much harder to achieve than cross-searching. To be able to jump from a specific subject in one service to equivalent groups of resources in other gateways requires difficult and time consuming work with cross-walks and mappings between classification systems, and potentially in different languages, too. Methodologies and techniques for doing this are not very well developed yet, despite a fast growing interest in this approach.

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Techniques for Exploration of Electronic Information Sources

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ABSTRACT

Searching of electronic database is often a quite significant problem to many users. There is a plethora of search techniques to find desired information. Knowledge of search techniques is necessary to get exact information from variety of databases. Search techniques of electronic resources are usually concerned with finding correct search term, refining, narrowing, broadening searches along with getting desired search results from in-house as well as remote databases. This paper highlights various search methods of electronic resources to find desired information.

INTRODUCTION

In the modern era Libraries have become information centers and provide a variety of services to support research and development, industrial productivity, management, marketing, trade etc. Every one needs one or the other information for his or her day today working. In modern age of information technology internet has a huge repository of all types of information. These are mostly computer based information services and can broadly be divided in various categories. Some of the significant services, which have evolved as a result of development in computers and communication technologies, are:

- Current Awareness Services
- Selective Dissemination of Information Services
- Printed Index Services
- Document Delivery Services
- Online Search Services etc.

THE ONLINE SEARCH

In present time, online search service providers are attempting to respond to the long felt need of devising common interface tools such as bibliographic, indexing and abstracting databases and directories including websites, which indicate the location of information as well as full text. The process of online searching of remote databases in most cases involves a dialogue between the searcher and the host computer on which a range of databases are mounted. A computer terminal operated by the searcher is connected to the host computer through a link. An outline of the equipment (*Burton and Petrie, 1991)* is shown in the figure below.

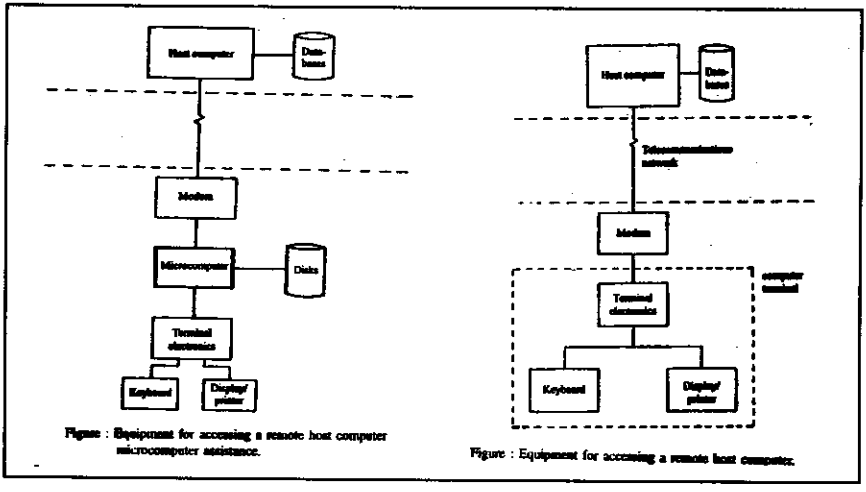


Figure : Equipment for accessing a remote host computer microcomputer assistance.

Figure : Equipment for accessing a remote host computer.

Sources: Burton, PF and Petrie, J. H : Information Management Technology Page No. 105 & 107

CDROM DATABASE SEARCH

The first stage in conducting a search is to develop a clear concept of the information required by the user. The search may be conducted by, the user alone, by the users and the librarian in cooperation and consultation, however sometimes it may not be possible to specify exactly what information is required by the user before performing the search. However, it is possible to strive for as precise a specification as the user can achieve on the basis of present knowledge. The specification may include a preliminary attempt to express the search in the indexing language of the database to be searched, and to frame a search strategy. After these preliminary planning stages, the searcher connects to the chosen search service and may view any information on the screen. Once the database or range of databases is selected, the search proceeds according to a series of parameters introduced by the user and the system responds by indicating the number of records that match the search criteria. Thereafter, the user may display the details of these records. If

the search is for a specific item of information or document this may be read online.

IMPORTANT DATABASES OF AGRICULTURAL SCIENCES

CD-ROM has become an important medium for the storage and dissemination of information and many information products are available on CD-ROM. CD-ROMs represent a means of access to information alternative to online access to external databases. The networking environment changes vitally with the use of CD-ROMS. A popular use of networks, within a library and information service perspective, has to make CD-ROM databases accessible to the network users from remote workstations. Actually, the development of CD-ROMs has widened access to information. Some important CDROM Databases of Agriculture and related sciences are-

- CAB Abstract
- Food Science Technology Abstract
- AGRIS
- AGRICOLA
- Animal Production Database
- Derwent Biotechnology Abstract, etc.

SEARCH TECHNIQUES

SELECTING SEARCH TERMS

The first step of designing a search strategy is to determine the main concept or concepts from the topic of the research. Once the main concepts are determined, it is required to choose search terms (keywords) for these concepts. In a simple case, the search term used to describe the concept will be the same as the search term (keyword) used in the search. For example, (as presented in a table below) if search is for the learning about milk, then main concept is milk and the same is the search term for searching. On the other hand, user may use two or more terms to describe to the search concept, for example, if the information is required for "*Advances in manufacturing of cheese during 1990-2000*' in this case main concepts are *manufacture*, *cheese* and *1990-2000*.

Description	Search Example
A word	Fat
A number	1994
Any combination of letters and/ or numbers	3M
A phrase	Dairy Products
A phrase with an operator in quotes (an operator that is a stop word will be ignored)	"advances in" Fat-Rich products
A hyphenated phrase or descriptor	Milk-Fat

A root (truncated) word, indicated by an asterisk	SNF*
A word with wildcard(s) indicated by one or more question marks	Los?es
A previous search request, preceded by the # sign	#5
Any of the above, combined with an operator	Cow or Calf or #5
Any of the above, grouped with parentheses for clarity	(Cow or Buffalo) in ti

FINDING THE CORRECT SEARCH TERM

Many databases use a controlled vocabulary and specified set of terms in their indexing records. If the keywords selected initially do not match the controlled vocabulary of the database, the desired search results are not retrieved. For example, in the CABCD database, the controlled vocabulary term '*beef fat*' is '*tallow*'. If the search is made for '*beef fat*', *no* record will be retrieved as they may have been indexed under the term '*tallow*'. Hence, if the keywords chosen initially do not retrieve the desired results, the search should be made for the synonyms or related terms used in the database. The synonyms or related terms may be determined by using the Index or by using the Thesaurus.

USING THE INDEX

An index is an alphabetical list of all words and hyphenated phrases used in the free text (non-limit) fields of that database. For each term, the index lists the number of times it occurs and the number of records in which it occurs. Index can also be used to check the spelling of terms or to see if they occur in the database, or to look for synonyms.

USING THE THESAURUS

In bibliographic systems many databases have a thesaurus i.e. a list of the controlled vocabulary, to describe document content is common. By searching on a well designed and implemented controlled vocabulary, users can improve results (*Bates, 1988*). Usually the concerned thesaurus is available online with the database. Printed versions of some of these thesauruses are also available directly from the database producers.

REFINING SEARCHES

During the search, occasionally the search does not return the required exact results. In some cases, too many records are retrieved and in other cases, too few. The following are the ways to tailor the original search concepts to fit to the vocabulary used in the database. Technically the process is known as narrowing or broadening of the search to get the desired results.

NARROWING A SEARCH

When the search retrieves too many records, the following techniques are used to narrow the search.

- *Using Operators:* the operators are words, which have a special meaning in the search software. These are used to combine search terms into a more complex search statement, four operators i.e. *'and, with, near, & not'* are especially useful for narrowing the search. The operator 'and' retrieves the records which have both the terms in same record and the operator 'with' searches the record which have both the terms in the same field. The operator 'near' searches for both terms that appear in the same sentence and have an even closer relationship than either and or with and the operator 'not' exclude records containing the search terms from the results.
- *Field-specific searching*: This technique is useful for eliminating false results and it is used to narrow or limit search in a particular field.
- *Using Keywords (Descriptors):* Databases commonly have special descriptor fields that indicate the main topic or the focus of the record. These descriptor fields often abbreviated as DE in computer databases and in printed sources as keywords. They contain hyphenated terms for which search may be made.
- *Using Limit fields:* Each online information source called database contains several specially indexed fields known as limit fields. Limit field typically contain information common to a large number of records such as publication year or language.
- *Using the Index:* The index may be used to find more specific terms to describe the search topic. The index is especially useful in narrowing searches to records by a particular author.
- *Using the Thesaurus:* Thesaurus is also helpful in locating more specific terms to narrow the search. Adding them with the help of hyphen can also use the subheadings.

COMBINING TECHNIQUES TO NARROW A SEARCH

The above described techniques can also be combined to narrow searches and user can use these operators with field-specific searching. In the cases of combined techniques the parentheses are used to clear the meaning of the search statement, for example, if the information is required for 'Research on harvesting of fat'.

(Fat and Harvest) in DE

In this statement, 'and' operator is used to search for only those records that contain both *'fat'* and *'harvest'*. In addition, by using 'in' operator

search is restricted to the Descriptor field (DE) only. Here the parentheses are used to group *'fat'* and *'harvest'*. Parentheses are often required in complex search statements to ensure search software interprets statement correctly. If the parentheses are omitted, software will search for *Fat and (harvest in DE)*, separately.

BROADENING A SEARCH

When the search retrieves too few records, the following search techniques are used to broadening the search for increasing the number of retrieved records:

- Use of *'or'* operator for synonymous terms for example *'fat'* or *'SNF'* will search for record having either *'fat' or 'SNF'*.
- Truncation i.e. use of asterisk (*) at the end of a word or word root for example *Fat** will search for both *'Fat'* and *'Fatty'*.
- *Wildcard searching* i.e. use of wildcard symbol (a question mark) to search for alternate characters within a word.
- *Using the index* which works in conjunction with the 'or' operator to help us broaden a search. The index is more efficient than truncation when several search terms required with the same root.
- *Omitting hyphens from descriptors*: This technique is especially useful for picking up references where the term is not the first word in a phrase.
- *Using the Thesaurus*: Following ways may be used to broaden the search-using thesaurus.
- Using broader term
- Selecting multiple terms
- Exploding search terms
- Using all subheadings
- Lateral searching-choosing search terms from retrieved records: This technique of selecting additional search terms from previously retrieved records is an excellent way to broaden a search.
- Searching other discs and databases: Broaden the search by searching more than one disc from a database set or by continuing search on another database.

SEARCHING ON THE INTERNET

A vast array of databases and services are available through the Internet. It is necessary to design interfaces that help users who search for information sources and services available on the Internet. This is because retrieval is recognized to be a complex and significant problem on the Internet. The reason for this is that the databases mounted on the net are in a wide variety of different formats, and different search

retrieval software packages mounted on different computers and are providing access via different interfaces to subsets of the databases (*Chu, 2003*). The search techniques mention above are also useful for searching CD-ROM databases as well as databases available on internet with minor local changes.

OUTPUTTING SEARCH RESULTS

Once the records are retrieved, records may be browsed and marked for later printing or downloading, the records can be downloaded to save them on floppy, pen drive or hard disk as a file for printing or for sending through Email etc. The records may be saved in a variety of formats by changing the settings for the print, and download options.

CONCLUSION

It can be concluded that in the present time the libraries are not the mere collection centre of books and literature but are information resources. Majority of literature is coming in soft versions; users should have skills to dig out desired information. However, the library personnel must collect and have knowledge on all electronic resources to answer questions on behalf of users, or to offer services that direct them to specific electronic resources. In either case, it is necessary to evaluate the electronic resources. Though there are no explicit criteria available for this purpose, however, the traditional criteria used for print evaluation might still be useful in the evaluation of electronic resources to some extent. However, before attempting exploration for the information, as the mentioned above search techniques are valuable and must be learnt by a user and library person. It will not only be useful in the retrieval of relevant outcome but also save the time, money and energy of the researchers.

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The Internet – Based Resources and Services

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ABSTRACT

In this paper, we trace the changing nature of Internet based resources and services in the digital era. Research libraries are fast changing from conventional methods to information storage and retrieval. Researchers have great expectations from the information professionals to make the resources in machine-readable form/electronic-form. So they can have web access to the same.

INTRODUCTION

Twenty-first-century library collections are an mix of traditional materials shelved in the library (books, maps, videos, music, pictures, drawings), which are in most places, still the larger proportion of offerings, and electronic resources delivered via computer wherever patrons have computers with appropriate connections not solely in the library itself. Increasing numbers of libraries are acquiring electronic resources as a significant and growing proportion of their collections. Because these resources are not merely a new type of object that gets purchased and placed a shelves in the usual way. Their acquisition, organization, and maintenance are having a major impact an library organization and management.

Electronic materials, known as electronic resources to catalogers, are not purchased but are leased by negotiating contracts with their owners or distributors. Libraries buy the right to access and use the materials but do not own them, and because the materials are electronic signals, when the right to access them ends, no physical objects are left in the library Thus one of the main differences between traditional materials and new electronic materials is that they are not ordered and paid for the same way. Electronic resources or Internet based resources are invaluable research tools, which complement print-based resources in any traditional library, Internet or electronic resources are now as print sources. The meaning of library changes from day by day. They offer

totally new environment, new resources and now services to the users. The library collection will depend on user needs. In the modern digital era most of the library collection will be e-resources. So, all collection of electronic resources is to provide specific pin-pointed, exhaustive, expeditious dissemination of information service to their users. Internet or electronic resources are now recognized as of being of importance to even small academic and public libraries and they are consuming an ever-increasing share of library budgets, often to the detriment of monographic acquisitions. CD-ROMs, local area networks, computer-equipments, online resources, the Internet, and other remote databases all provide libraries with vast resources for their user populations.

DEFINITION:

There are various definitions for Internet-based electronic resources (Tonta, 1996). The term Internet-based electronic resources or e-sources was broadly defined to include sources that are available via web browsers, FTP, gopher, telnet, mailing list, e-mail, or other network tools or protocols, such as the following:

(1) e-mail correspondence;

(2) messages posted to mailing lists and newsgroups;

(3) publications available via the web; FTP or gopher, which could be self-publications, articles in e-journals, newsletters or other electronic serials, working documents, technical papers. Preprints, conference papers, books and so forth;

(4) Commercial electronic resources ;

(5) Other electronic sources available from the Internet.

INTERNET:

The Internet is global systems of interconnected computer networks that use the standard Internet protocol suite (TCP/IP) to serve billions of users world wide. It is a network of networks that consists of millions of private and public, academic, business, and government networks of local to global scope that are linked by a broad array of electronic and optical networking technologies. The Internet carries a vast array of information resources and services, most notably the inter-linked hypertext document of the World Wide Web (www) and the infrastructure to support electronic mail.

INTERNET OR ELECTRONIC RESOURCES:

Internet or e-resources are now recognized as being of great importance to libraries. The resources of libraries which are available in electronic

form or digital form or on Internet are called electronic resources and re-resources are defined as those electronic information resources and services that users can access electronically via a computer network from inside need in the world of digital information, libraries must revise their way of working. The collection of the library automatically changes day by day with the change of users demands. Due to the revolution of information communication and technology, modern or higher institutions or organization have started to subscribe e-resources for their better facilities.

TYPES OF INTERNET RESOURCES:

One of the major developments in libraries and information systems in the advent and spread of electronic information resources, services, and networks as a result of developments in information and communication technologies. The commonly available Internet resources are viz. online database, and Internet etc. The various types of Internet resources are:

(1) E-journals:

E-journals may be defined as any journal, magazine, newsletter or serial publication available over Internet in electronic format. The journal which are available in electronic format/media like www; some are available on online, some may be available both in electronic media and in print media. E-journals are accessed through Gopher, FTP, telnet and e-mail.

(2) E-Books:

E-books are comprised of any book or monograph of text made available in electronic form. E-books are appearing under the e-resources. Some books are published in print form as well as in e-book format, while some are beginning to be available only in electronic format. Some e-books include multimedia capabilities so they are called multimedia e-books, which include text, graphics, and audio, video and animation effects. E-books can be stored in hard disk server, CD-ROMs or in DVD-ROM.

(3) E-Database:

A database is a collection of related items of information held in a form intelligible to the computer; these items may be references to journal papers. They may be the latest balance sheets for Companies, they may be the full text of journal papers. The e-databases may be of two types:-

(a) Bibliographic Databases:

According to P.S. kawatra, bibliographic database contains a file of document description that is records. One can use for deciding whether to search for the document itself. Document may be journal articles,

reports, patents, books etc. for examples are COMPENDEX, MEDLARS, INSPEC.

(b) Non-bibliographic Databases:

It is also referred as data-banks or fact banks. Databank is used by a number of Indian Institutes for their information storage, processing and retrieval purposes. It is of two types:-

(i) Textual database

(ii) Numerical/statistical database

Examples are: Encyclopedia of Associations. Database by Gale Research Company.

(4) Cataloger Card Database:

Machine readable cataloger database in for house keeping work of information retrieval. For example MARC.

(5) E-Theses and Dissertations (ETD):

ETDs are digitized version of theses and dissertations. Resources for graduate students who are writing theses or dissertations and jointly published in online are called e-theses and dissertations. It is consulted by faculty staffs, research scholars and graduate students. It is specifically for academic researchers and their members, yet any one interested in research and e-publishing will enjoy this resource. There is a good number of ETD submission website. It administrators at universities take initiative for ETD programs. Network Digital Library of These and Dissertations (NDLTD) is a non-profit organization trying to develop accessible digital libraries of theses and dissertations.

(6) Other Internet or electronic Resources:

(a) E-papers:

E-papers opened a new paradigm for paperless society. Through e-papers; it is possible to broadcast the documents to large numbers of recipients through on-line communication system.

(b) E-reference Resources:

E-reference resources like maps. Atlases, encyclopedias, directories, dictionaries, citation guides. Bibliographical sources and translation services mostly.

(c) E-content pages:

Provide desktop access to the digitalized content pages of books, proceedings, journals etc.

(d) Multimedia Digital sources:

Multimedia digital resources are the resources in combination of two or more media such as text images and animation, audio and video.

ROLE OF INTERNET OF E-RESOURCES IN EDUCATION AND RESEARCH:

Internet or E-resources are invaluable research tools which complement print based resources in any traditional library. Electronic resources provide access to information that might be restricted to the user because of geographical location or finances.

Electronic resources also provide access to current information as these are often updated frequently. Through their various search techniques, electronic resources provide extensive links to explore additional resources or related content. In addition, electronic resources are convenient to use since users are able to access information from the library. Internet café and offices or at times from the comfort of their homes at any time of the day. It is for these reasons, electronic resources are considered as an important resources of teaching, research and training. Thus, most of libraries as well as the universities of the present day provide electronic resources for higher education and research.

ADVANTAGES OF INTERNET RESOURCES:

The followings are the major advantages of the Internet Resources:

- **Speed:** - The speed of publication and diversity of each issue of electronic resources (e-journals, articles) is much faster them the print. E-resources also reduce the time gap between authors of the paper and the end user.
- **Distribution:** - The major advantages of electronic resources are their global distribution, their hypertext link, the ability to access from different sites and the ability to search.
- **Printing & Downloading:** - Electronic resources provide the facilities of downloading and printing of the appropriate resources at end user workstations.
- **Saving space:** - with the introduction of e-resources, libraries will be relieved of many problems, such as space, shelving, missing issues, missing pages, and ripping of the ages etc, which have considerable time.
- **Searching and Retrieval:** - There are a number of search engines available to access and to retrieve the appropriate

electronic resources from the web. It also provides the facility of keywords search, author search, subject search etc.

- **Multiple Accesses:** - The most important advantages of the e-resources are that it can be used at the same time by a number of users.
- **Round the clock Availability:** - A major advantage of e-resources is that user can gain access to the information at any time, night or day.
- **Archiving:** - There are very small incremental costs to storing longer documents so it is easy to include data sets, images detailed analyzers, simulations etc. that can improve scientific communication. Some of the publisher's provide complete volume on CD-ROM at the end of the year if the condition is incorporated in the agreement.
- **Manageability:** - Electronic resources or Information can easily be managed by adding book makers and personal notes to the private files or databases for copying and editing.
- **Interactive:** - The rapid turnaround time means that articles can be read, commented on by the journal readers, and amended much more quickly them can be done with print. The ease with which e-mail can be much greater feedback through the web.
- **Links:** - Links are mainstay of the hypertext format, should be exploited. Not only papers can link to those they have cited, but with a bit of effort, they can be linked to those that cite them.

DISADVANTAGE OF INTERNET RESOURCES:

The following are the major disadvantage of Internet resources:

- **Difficult to read on computer screens:** - The main disadvantages of the Internet information are the limitations of the computer monitor. This leads to problems with reading, particularly over four or five screens, annotations and portability. Although the ideal would be to read information from the screen. I think that with printing facilities, this ought not to be a huge constraint on the development of e-journals, because at the moment most people photocopy library copies of journals before liking them away anyway.
- **Technical Problems:** - Degradation and obsolescence of the media use for storing electronic information and software used for manipulation of the stored electronic information are the two major issues related to digitization.

- **Lack of standards:** - There is a lack of standards as the guidelines and best practices for producing and maintain digital objects for the long term are in the development stage.
- **Authenticity:** - It is difficult to ascertain the authenticity and integrity of an image or text when it is electronic form, as it is very easy to manipulate and temper with data in electronic form.

INTERNET SERVICES:

Our access the information or communication with others on the Internet by using a collection of tools and services that give us access to people, information and resources. These are as following:

1. Electronic mail (e-mail): - Electronic mail (E-mail) is an efficient and convenient means of user-to-user communication. E-mail has many similarities with the paper mail system we are all familiar with. Everyone on the Internet has an E-mail address, just like our own postal address. All we need is someone's address and we can send him or her all sorts of things-documents, pictures, audio/video, and so on.

2. Telnet: - Telnet allows us to connect to and log in to a remote computer. We can access any of the public services or tools at the remote site. Telnet can be used for access to libraries, databases, and other Internet services.

3. FTP: - FTP or File Transfer Protocol lets us transfer files from computer on the Internet to another. Many systems on the Internet make archives or collections of files available through anonymous FTP.

A number of other tools and services have been built to take advantage of these basic services, to make them easier to use, and to extend their use. Some of these tools are designed to search the Internet for resources.

4. Archie: - Archie service lets us search the archives of files accessible by anonymous FTP. We give the complete or partial name of the file and Archie returns the Internet address and location of files for us to use with anonymous FTP.

Other services and tools concentrate on providing easier (more user friendly) access to Internet resources along with some different ways of using the Internet.

5. Gopher: - Gopher is a menu based document delivery system. An individual uses Gopher to access various types of information such files, documents, address books, and images. Gopher also allows access to FTP, Telnet, and searchable databases. All of this is done by selecting items from menus.

6. WAIS: - WAIS stands for Wide Area Information System. The newer tools and programs provide a common method to access almost all the others having a single way to access all the Internet services means having more than one super-duper program or exceptional tool. The idea behind the WWW is a single means of access to virtually everything available through the Internet: services, resources, tools, and information.

7. World Wide Web: - World Wide Web (WWW) gives hypertext, even hypermedia, access to all varieties of resources and services on the Internet. There are several programs used to work with the Internet in this fashion including Lynx and Mosaic. The WWW is not a tool, program, or service, but a way of viewing and accessing the Internet. Even with this view we need to know about the basic services we will access.

8. Web search: - These are tools that keep track of many web sites around the world and let us search for particular items whenever we want. The result of a search is a custom list of links, pointing to whatever items the search engine found that met our criteria.

9. Usenet: - The name Usenet is a contraction of "User's Network". It is a system of discussion groups in which individual articles are distributed throughout the world. To participate in Usenet, one can use a client program called a newsreader.

10. Mailing list: -

Mailing list is an organized system in which a group of people are sent messages pertaining to a certain topic. All mailing lists have someone in charge who administers the list.

11. Talk Facilities: - A talk facility allows us to communicate with other people on the Net in the real time, either by typing messages back and forth or by actual voice conversation.

12. Internet Relay chat: - Usually called IRC, Internet Relay Chat is a public talk facility, which can be used by anyone on the Net at any time. Each IRC conversation is carried on a channel.

Question Answering Service: - Ask ERIC is a network based education information service offering library media specialist access to a question answering service.

International Inter Library Loans: - Libraries now have their users from all over the world. And Internet accessible library catalogues and provide inter library loan verifications and offer a bank of reference materials that enhance local library collections

Document Delivery Services: - There has been a rapid growth in fee-based document delivery services that use the network to order and/or

transfer documents to libraries and often end users, bypassing libraries completely.

Online Transactions: - Major bibliographic utilities are experimenting with the use of real time bibliographic transactions over the network, which already supporting batch mode transactions.

Government information: - Government information can be distributed over the network to libraries allowing unparalleled opportunities for libraries to inform communities and constituents about government issues.

***Shaving of information*:** - Technical standards such as Z39.50 coordinates the transfer of information between different systems and formats over the network. These standards are essential to libraries as automated library systems share information and streamline processing using the Internet.

CONCLUSION:

Internet resources being relatively a new trend in the information world or digital era has generated a lot of debate over its access, storage, preservation and copyright. Its further development and issues sorrowing it can be resolved with collaborative efforts of librarians, researchers and the publishers. The library professionals have not acquire only the electronic resources but also organize them for optimum access with adequate and appropriate navigation structures to enable their clientele to exploit the Internet resources clientele's maximum advantages. Emergence of Information technology has completely changed the definition and dimension of library services; hence we can not ignore the role of Internet resources in library service. We should prepare ourselves to take the advantages of Internet resources in forth coming time.

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Use of Databases and Online Services in the School Library: An Observation

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ABSTRACT

This paper will look at the benefits of databases and online services and examine the different online services and how they operate. The principles used when setting up those databases and methods of utilization by teacher librarians and students in the school library were analyzed.

INTRODUCTION

The school library is a place where students and teachers should be able to find the information that they need to support their research tasks. Ten years ago the school library in Australia predominantly contained print materials to meet these requirements, but today the Internet and computers have provided the potential to access huge amounts of global information. The teacher librarian has the role of facilitating access to this explosion of information, and of instructing teachers and students in effective ways of finding, evaluating and presenting it. We believe that teaching students how to become lifelong learners by using a range of specialist information tools, services and technologies is the pivotal role for teacher librarians today. The use of online services and databases facilitates this role by freeing teacher librarians from many time consuming tasks in administration.

What is a Database and Online Service?

A database is a carefully organised grouping of data in a predetermined format. The data usually contains a central focus. A database makes it easy to find specific pieces of information by organizing its contents into columns and rows (also known as fields and records). One might use a variety of database tools such as applications like FileMaker Pro or Access, to enter and update the data in a database. Online services

employ databases to store their records. A familiar example to teacher librarians would be the library catalogue system, which utilizes a database of holdings for its catalogue. Other well-known online services that include the use of databases are;

- Electric Library,
- EBSCO World Magazine Bank,
- Education Network Australia, EdNA Online,
- SCIS School Cataloguing Information Service etc.

Selection of Online Services

The following some of the important factors are to be considered while selection of online services to schools libraries;.

1. The audience of individual school and their study, teaching, recreation and research needs must be considered.
2. The question of whether the database will save the time and give the opportunity to develop more effective teaching activities with students should be investigated.
3. The quality and relevance of the information stored in the database will also be important to examine.
4. The information should be well organized and adhere to international standards were ever applicable.
5. Cost is also very important. It may be necessary to make additional budget requests to obtain the money to purchase subscriptions.

Further it is also the role of the teacher librarian to provide access to local knowledge networks. Sometimes it is possible to obtain access to databases through other sources. In Australia many public libraries have subscribed to online databases that school libraries would find very useful. Students and teachers could be encouraged to join the public library. This would give them access to the databases. An example of the database holdings at the Onkaparinga Public Libraries, in Adelaide, can be found at:

http://www.onkaparingacity.com/lib/page?pg=334&stypen=html

The Australian Capital Territory Public Library also has a good collection that its members can use:

http://wfxsearch.webfeat.org/wfsearch/menu?cid=10228

Examples of Databases

School Cataloguing Information Service (SCIS)

Perhaps one of the most time consuming tasks in the school library is adding records to the catalogue, and then maintaining that catalogue in a well organised, up to date manner. In Australia the school library has traditionally used databases, particularly in reference to the school library catalogue. When libraries became automated, the School Cataloguing Information Service (SCIS) http://www2.curriculum.edu.au/scis/home.html

EdNA Online (Education Network Australia)

Another Australian national initiative has been the **EdNA Online** (Education Network Australia) database, http://www.edna.edu.au/ that is cross sectoral, encompassing Schools, Vocational Education and Training, Higher Education and Adult and Community Education sectors. It contains web sites that have been selected, evaluated, described and entered into the database by Information Officers. It is a free service.

EdNA Online is a database that is organised to store information about the URLs that it contains. This kind of information is called metadata, or "data about data." The metadata entry is made following the international standard set down by Dublin Core (DC), http://www.dublincore.org and using EdNA standards.

Database of Award Winning Children's Literature:

Another database is the **Award Winning Children's Literature** database by Lisa Bartles http://www.dawcl.com/. The purpose of this database is to create a tailored reading list of quality children's literature or to find out if a book has won one of the indexed awards. DAWCL has over 3,500 records from 49 awards across five English-speaking countries (United States, Canada, Australia, New Zealand, and the United Kingdom).

WebLinks Online

Another example of a database of Internet sites is WebLinks Online which can be found at http://www.weblinksresearch.com/login. It is a database of approximately14,000 web sites that have been selected by teachers and teacher librarians to specifically meet the research needs of students in the school library.

FileMaker Pro http://www.filemaker.com/downloads/ was selected as the WebLinks database application because it is easy to use and very powerful in terms of the files and formats that can be exported.

FileMaker Pro is also well supported by Web-site tutorials that provide training and development. Some can be found at http://www.ehow.com/way_5365934_file-maker-pro-tutorials.html

The information developed for the initial WebLinks Online service was planned with standards and stored in a database. This gave Pledger Consulting the flexibility to be able to use it in many ways. Items that were for Primary School students only could be extracted and items could be called up for a United Kingdom database. The latest innovation is the conversion of the database into MARC records that can be loaded into school library catalogues.

LinksPlus: A Database of web sites in MARC format for loading into the catalogue:

A development of library systems has been the introduction of library catalogue software that enables the import of records in MARC format. Modern automated catalogues can also be linked to Internet Web-browsers. In 2001, it was decided to convert the WebLinks database file to MARC format so that subscribers can now import approximately 10,000 records of web sites into their catalogue. A sample of 30 MARC format records on volcanoes can be found at: http://weblinksresearch.com/download/volcanoes.zip

Patrons can search on their library OPAC for both book and selected web site resources. An example of this can be found at the Adelaide Hills Public Library catalogue demonstration site. Search for 'volcanoes' at http://arnie.ahc.sa.gov.au/spydus.html

Because the URLs in the database are kept up-to-date, changed links are automatically placed in the catalogue when the updated database is imported. This eliminates the manual deletion of records with dead links, a very time consuming task.

Exporting and Publishing from the WebLinks database:

It is also possible to export the information from the WebLinks database to publish in other formats. For example, the web sites listed under 'Volcanoes' in the database can be printed from a .pdf format export file.

ReadPlus

The appreciation of literature is an important aspect of teacher librarians' work. Read Plus http://www.readplus.com.au is a database using information that has been developed by Pat Pledger and Fran Knight in a series of books that provide lists of children's literature under subject headings. It is an entry point to information by subject to children's fiction, and film, reviews, read similar authors, read similar titles and

teacher resources from around the world with an emphasis on Australian books.

Developing Databases for School Library:

It is worthwhile developing your own databases for some tasks if you want to become better organized and if you want to refocus your time and effort on other more effective ways of helping your students. If you find that you are spending a lot of time looking for information in your filing drawers or if your teachers are not happy with the way they can retrieve information about resources that they need, then it would be useful considering putting that information into a database.

School libraries are certainly benefited from a database if the improvements you get from it are worth the effort to create and maintain it. Here are some indicators that a database could be very beneficial.

- A lot of repetitive data-related tasks are involved, for example lists of web sites
- Much of the same data is used over and over, but in different sequences or order, for instance fiction lists
- You have too many bibliographies or lists to maintain by hand and to retrieve the information from them easily, for example lists of video tapes
- Being able to have current information readily available is very important, such as newspaper articles.

Uses of Library Developed Databases:

There are several types of information that may be of use to the school library if records were put into a database. These include fiction lists of personal reading, web site lists, videotape inventory, magazine lists, scanned newspaper items of local interest and local history/photograph archives. Printing out bibliographies to give to teachers and students is easy to achieve once the information has been put into a database

Fiction bibliographies:

Fiction databases are perhaps the most obvious to use in the school library, particularly if you have English teachers who enjoy the teacher librarian giving book talks. Before you begin your database, set up the fields that you might need – good databases will allow you to add others later if you find that you require them. This requires thinking about the types of information that you wish to extract. The database must allow you to present only the relevant parts of a document that you want to give to students or teachers. For example in setting up a fiction list, you

would need some or all of the following fields: author, title, genre, subject, book talk notes, page numbers of appropriate sections to read aloud for your use only, age range, recommended by, film associated with it

Video holdings

Sometimes it is difficult to extract bibliographies of video titles in subject areas. A small database would help overcome this problem. Appropriate fields would be program title, date, source, length, notes, subject, and key learning areas.

Magazine listings

A database can be very useful for storing information about magazines that are purchased. Details of place of purchase, agent's telephone numbers, price, who pays for them, renewal date and location can all be retrieved very easily and published.

Students using databases to store research information

Information in electronic form is much easier to store and organize for review than printed material. Students need to know how to take notes electronically. The information will be more valuable and more retrievable later on, if it sits within the computer rather than in pages of printed material. A database application can be open at the same time that information is accessed on the Internet. Useful information can be selected then copied straight onto a database.

Student researchers will need to be taught the most appropriate way of coming up with fields and records for their database, which will result in easily searched, valuable information. Each time a student or team of students finds worthwhile information, the best parts could be saved in the following manner:

Source (Author, Title, Date, URL)	
Key question (s)	
Main ideas / keywords	
Abstract or summary	

Examples of web-pages that reflect the use of databases and online services

School libraries that have developed their own home pages usually put up lists of the online databases to which they subscribe. This enables students and teachers to access them from home as well as for research during school hours.

http://www.upweyhs.vic.edu.au/library/index.htm

http://www.mta.qld.edu.au/OnlineLibrary.htm#165216

http://www.concordia.qld.edu.au/index.php/39

CONCLUSION:

Databases selected to meet the needs of the school library, whether purchased or developed specifically for an individual school library, are very powerful tools. They provide research information that would not normally be as readily available to students and teachers and are usually easy to navigate enabling efficient resource discovery. They are time saving tools, enabling the teacher library and school library staff to spend their time effectively working with teachers and students.

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Application of Digital Technology in Library Resource Sharing

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ABSTRACT

This Paper highlights the different resources, their use and application in modern day libraries in the light of digital technology. Different medias /and ways for resource sharing through digital divide have been identified and discussed. These include Web Opac, Library Networks, Library Consortia, Open Sources etc. Library Consortia, Digital Repository, Online databases are suggested as key ingredient for present day library resource sharing. Special emphasize is given to India and attempts have been made to discuss all these areas both theoretically and based on practical experiences and application.

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Libraries and Digital Copyright

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ABSTRACT

This paper discusses the copyright provisions wrt to digital libraries.
Several issues of concern to library community have been raised and discussed. The latest amendment of copyright act discuss about computer software and issues like downloading, internet –related process and multimedia. Thus it is an effort to give a brief idea about the copyright issues in relation to digital libraries.

KEY-WORDS: copyright, digital copyright, act, law.

INTRODUCTION

The present era is a era of information have's and information have not. The countries who have made timely fusion of technological, technical, legal aspects wrt to copyright are in the forefront to be knowledge superpower and rules the world. Copyright has no longer remained a simple law to imply but now it has become a legally complicated subject to a number of misunderstandings and generally not fully understood by the libraries/ librarians whose daily task include administering it.

The recent development in information infrastructure has disclosed a wide spectrum of information repositories data network and information appliances. The access to electronic information sources is redefining its user domain from a group of specialized client to a wide range of users including computer specialists; discipline experts etc. This sea- change in information infrastructure including the contemporary society to be an information society has in turn posed various challenges to the existing structure of library. Copyright subsists in many of the electronic products or services available online. Copyright is considered a key factor in generating the return needed to stimulate the creation and marketing of a wide range of new content. The advent of new and powerful digital information and communication technologies ,the means for sharing and exchanging on a global scale, have paved a way for availability of large

quantity of information at a low and diminishing cost. Copyright is considered as a key factor in generating the return needed to stimulate the creation and marketing of a wide range of new content. This will be possible on a country's ability to prevent / discourage unauthorized copying and distribution activities which are easily carried out in digitally networked environment.

In the present age of digital technology and electronic publishing, copyright poses a serious problem for developing digital libraries.

The progress of digital technology and electronic publishing has brought with it various problems which have to be dealt with the "machine" itself to put a check to digital and electronic piracy. Thus the answer to the machine lies in the machine itself. The Indian technocrats are developing methodology to check copyright infringement and secondly to check the source of infringement origin.

But the key motto should be protection of copyright can never become an obstacle in the way of dissemination of knowledge and information.

CHALLENGES AHEAD FOR COPYRIGHT IN DIGITAL LIBRARIES

Copyright is increasingly being challenged with the intensification of internet.

There is need to understand the role and function of copyright in the digital era and digital library in particular. Communication and computer technology converged and led to a new "techno economic paradigm" which is characterized by low cost of storing, processing and communicating information.

In libraries some of the operations where copyright issues are applied are:

- Libraries have to make their own copies of the document for their wider use, when their reprints are not available.
- In present age of electronic publishing and on-line delivery of information user's demand for electronic copies, thus there are probable chances of infringement.
- Reproduction of images and audio- visual works also lead to infringement of author's moral rights.
- Electro copying is conservation of printed material into machine readable form using document images processing and optical character recognition technology.

- Multimedia products involves a bundle of media like text ,images ,sound recording etc bundled into a single product and there is a no clear cut policy in this regard in copyright law which creates a dilemma .
- Archiving rights are given to libraries to make copies of printed books and out of print books but nothing has been said about the process of digitization which is core activity of digital libraries
- The foremost focus is wrt to changed status of libraries where everything is served in the form of 1's and 0'sand thus complete realization of the idea of copyright is lacking and control seem to be questionable.

COPY RIGHT OR DIGITAL COPYRIGHT??

The digital era in which libraries operate has radically altered the word copyright.

Copyrighted material has become more vulnerable to unauthorized copying and new technologies have overcome the restrictions upon the dissemination of material that existed in the copyright era.

Libraries of today and tomorrow have to accommodate a variety of "new media" both to satisfy users need and to automate their various "House keeping" procedures.

Universal service and access to provide guaranteed access to and use of networking tools

IPR is the key issue while considering the new generation digital libraries. The prime focus of the digital libraries is democratizing information, empowering the masses and allowing the user to a vast array of resource. Modern technology has enhanced the library ability to reproduce, distribute, control and publish information and the World Wide Web has entitled every one to be a publisher within the world wide reach.

In the age of information technology , digital libraries has to play the role of mediator between commercial library service providers and the users with the aim to provide personalization and privacy at user end and security at service provider end.

Thus a digital library has to balance intellectual property with public interest using various access control methods.

CHECK POINT FOR LIBRARIANS IN DIGITAL WORLD

Digital information unfolds with it number of *issues and concerns* for the library community.

- The first confrontation is wrt the limitation over copying a work .It is restricted as
  - Single copy for private, personnel and commercial purpose, research and study.
  - For use as quotation.
  - In a criticism or review.
  - As a part of judicial proceedings.

Thus a librarian has to juggle between 3 core issues viz:

a) ***Provision of copies*** (for non commercial purpose)

Libraries making provision of copies need to know the purpose of use and secondly what is in public domain & what is not?

b) ***Creation of websites***. : Creation of local ports for users is accompanied by problem of linking which is within the ambit of copyright infringement arena.

c) ***Budgeting factors*** refers to obligations of libraries to comply with copyright while procuring data in the form of full text access by paying a fee ranging from $ 22 to as much a fee as $ 60 .Also retention of this copy in the library is objectionable and should be handed over to the person who has demanded the copy .

2) The second important factor is **over dependency of libraries** on the publishers of digital information in the sense that a digital resource like CD ROM publication can be referred for a certain period of time due to time lock in the installation software .Also it cannot be lent on interlibrary loan because of software failure on others computer.

3) The publishers make huge profits once the author transfer their copyright to authors whereas the author is not entitled for self archiving or to do anything with the work thus usability is limited to copyright rule .Hence there is a need for reshuffling of copyright laws which allows better usage over print material. The regulatory steps like cryptographic techniques, authentication of users and limits to their access, protection at network system, application and user work station levels, metering access times, regulation etc while protecting the digital copyright also work against fair use doctrine in libraries

4) The publishers **charge heftily** for electronic version of their product although internet and electronic publishing provides a reduced cost structure. Thus due to financial constraint it results in cancellation of those e- documents which should actually be provided at a reduced cost.

5) The important concept of "**repeated usage**" which is possible with printed publication (without extra payment) is paid many times for digital resources due to legal constraint on e- resources.

6) The DRM technologies have put a big question mark on the **open access initiative** to liberate the user and spur creativity and innovations.

Thus the copyright laws are supposed to advance knowledge through rewards to the creators in reality are deterring the potential users by curtailing free flow of information thereby defeating the universal declaration of human rights.

The irony is that librarians have to buy back copyrighted materials as highly priced periodicals that their R & D, scientific and academic community has given away to publishers free of charge!!

THE INDIAN STATUS –QUO OF COPYRIGHT IN DIGITAL ERA

India has a very strong and comprehensive copyright law based on Indian copyright act , 1957, which was amended in 1981,1984, 992, 1994 , & 1999.The amendment in 1984 were a response to technological changes in the means of communication like broadcasting and telecasting and the emergence of new techniques like computer software. The 1999 amendment s have made copyright act fully compatible with trade related aspects of intellectual property (TRIPS) agreement. With these amendment Indian copyright law has become one of the most modern copyright law in the world..

Indian Copyright Act 1957 deals with the protection of computer software but it does not have any provision to check the piracy of software on internet. Several important amendment were introduced from time to time .The core question addressable by the copyright law still in state of dilemma are:

1) What does copyright protect?
2) When the protection does begins and end?
3) What is its meaning to owners?
4) What is its meaning to users?
5) What are libraries special rights wrt to copy?
6) What are library's right to lend?
7) What is fair use concept?

Section 51 of copyright act lays down the provision related to the infringement of copyright but it does not expressively provide as to

whether such an infringement occurred in cyberspace or in the physical world.

During the last 2 decades, a number of measures have been taken by Govt. of India like setting up of special copyright Enforcement Advisory Council for proper copyright enforcement. But equal attention should be given towards to the point that protection of copyright can never become an obstacle in way of dissemination of knowledge and information and answer to the technical issues lies within the preview of technology itself.

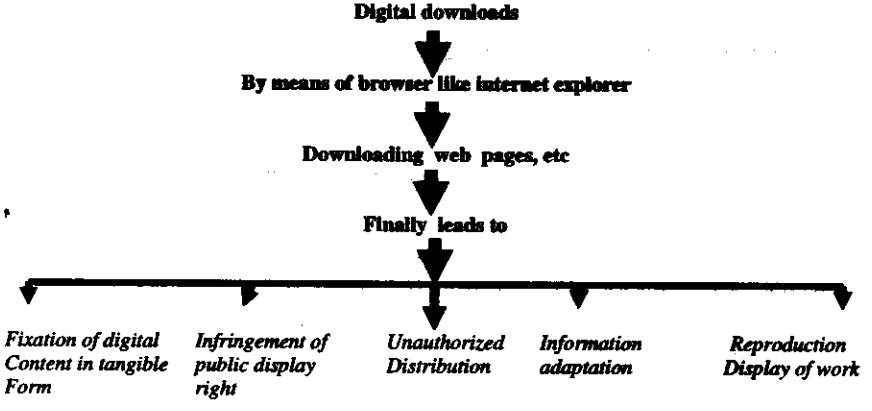
Digital libraries would benefit from a:-

- Expanded public domain.
- Revitalized fair use doctrine and originality requfrement.
- Rationalized system for copyright registration.
- A new frame work for compensating copyright owners for online infringement without imposing derivative copyright liability on technologies.

In the digital environment and basically wrt to digital libraries the major issue related to the databases, computer software , internet downloading , multimedia etc which constitute the resources of library in digital era assumes utmost importance.

Example of copyright infringement

Take for g.e. : Digital Download and the way it comes in way of copyright law.



PROPOSED PREVENTIVE MEASURES TO CHECK INFRINGEMENT IN DIGITAL LIBRARIES

1) To ask for consent copy from individual who demand for a copy having individual sign indicating the copy is for research and private study.

2) Protection of digital library by a password or IP based authentication known to library user only.

3) watermarking

4) Legalization of all the computer software and implementation of usage policies.

5) When a library wants to create a digital library of copyright led work, it can seek the permission of copyright owner and if it cannot be determine with certainty who owns copyright, it must perform risk analysis and take its decision on its own.

There is a reason to cheer about for the study of over 16 states by consumer international has ranked India at top of a list which gradually served national copyright law and enforcement practices.

CONCLUSION:

1) The copyright issues in digital era should be a perfect mix of compliance on one hand and exploitation on the other hand.

2) The existing copyright law in India is relatively balanced instrument that recognizes the interest of consumer through its broad private use expectations and by facilitating the compulsory licensing of the works that would be unavailable other -wise.

3) The borderless nature of internet and digital libraries thereof demand for a more encouraging relationship and close cooperation with the international organizations.

4) The librarian should continue to work as a catalyst for free flow of information between owners of copyright and users of information, but the role of author should be protected.

5) Librarians and information professionals should negotiate few electro copying privileges for legitimate commercial usage of electronic information similar to the kind of fair dealing arrangement.

6) Disparities in Copyright law of countries affect trans-border trade.

7) It is illusory to think that a carefully enacted legal code would be fool proof, there would be as many loopholes as needed for those who wish to ignore it.

8) Copyright being a proactive law should keep pace with technological development.

9) Copyright law on database producers, online hosts and users of online hosts and CD-ROM, does not provide clear-cut solution related to piracy and unauthorized use.

10) The existing Copyright law frustrates digital library growth and development by granting overlapping, overbroad and near – perpetual copyright in books, art, A-V works and digital content.

11) The new generation of libraries offers the integrated approach of "electronic " and " virtual" libraries .thus digital libraries are organizations that provide the resources including the specialized staff , to select the structure which offers intellectual access to interpret , distribute ,preserve the integrity and ensure the persistence over time of collections of digital works .Thus the demand on present generation digital libraries is to provide dependability, manageability, ease of use, interoperability, security and privacy.

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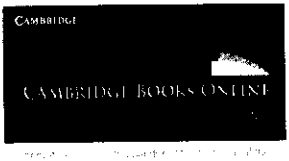
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Marketing of Library and Information Services

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ABSTRACT

Marketing is essential for any product or service that is market oriented. Marketing is a kind of strategy to create the demand and fulfill the existing demand for the product or service. Likewise, marketing of library and information services also demands proper marketing because the library users have turned into customers, and satisfying the customers has become the top priority for any library as it is for any business enterprise. The foundation for a great marketing plan of library and information services is to examine the library mission, values, and philosophy of service. Then analyze library capabilities and research customer needs to find out what works or what needs improvement. And then it is essential to use the analysis and research to establish goals, select strategies for promotion, develop the marketing plan of action, implement, and evaluate how well the libraries meet their goals. The results of evaluation can be used to make changes or to develop a new marketing plan that responds to changes in the library, in the community, and in the world of information. Marketing is not exclusively for businessmen. It is the "science of strategy," and its main objective is to make client (user) satisfaction, so it is necessary that the librarians act enthusiastically on marketing applications. This paper compares fundamental principals of marketing in the context of marketing of library and information services and suggests the necessary steps for increasing customer satisfaction in the libraries.

INTRODUCTION

Today's generation of students is not the same generation which used to take notes from black board, worked on windows 98, or spent their time quietly in the reading rooms of a library. Now they read and download books and articles from Internet, burn DVDs and search google for getting information. They constitute a new breed, the leading edge of a generation that promises to be the richest and savviest ever. They drive sport cars not scooters. They are technophiles not technophobes. They fax, phone, e-mail and chat on-line with their friends. Call them Generation next, Generation Y or Dotcommers, they are the cool, coddled, confident broods of yesterday's techno savvy flag bearers of the society.

This young lot of students is the biggest challenge in front of most of libraries around the globe. As libraries face the future, the biggest challenge is developing information services that support the learning activities of this new generation. Students are now customers. Libraries must understand what they want. The process of knowing customer's needs demands the action to fulfill them. Here the marketing of library and information services comes into play.

Marketing of Library and Information Services is the process of planning, pricing, promoting, and distributing library products to satisfy the library and it's customer. Marketing of Library and Information Services is ongoing and dynamic due to the changes in the needs of the customers and changes in library services itself. The marketing process determines the decisions and activities involved in meeting the needs of customers. It requires careful planning and begins with understanding the mission of the library. It can help in developing the mission of the library, establishing a positive image for the library in the community, and determining the best way to provide services to its users.

KNOWING THE NEEDS OF LIBRARY USERS

The simple way is to ask them. Surveys can be done. Focus group interviews can be used to develop solutions to problem situations and investigate further the results of simple questionnaires and surveys. Complaints and suggestions can be analyzed. Key visits can be made to significant clients, including Deans and Departmental/Faculty/ School Heads.

The library's numerous advisory committees can be consulted. After service delivery, immediate feedback can be sought. Many organizations have discovered they can find a great deal about their customers from asking their staff. They, after all, are in constant contact with customers. Having asked, it is important to listen to what is said. Another approach is to watch what customers do.

WHAT THE LIBRARY USERS REALLY WANT?

Overall, our library customers want basic services. They want competence, reliability, responsiveness, timeliness, honesty and a

caring approach. They want everything to work properly and assistance with use. They want promises made to them to be kept and they want what they need, when they need it. Students want information content for assignments, research or knowledge acquisition. They want assistance with assignments and research support. They want e-books and e-journals. They want real books and real journal articles. They want training and motivation in resources discovery, IT skills and
Equitable service delivery.

ROLE OF INTERNET IN MARKETING OF LIBRARY AND INFORMATION SERVICES

Internet has become a boon to the librarians. There is a remarkable and significant shift of reading material from the open access library shelves to the hands of the end users due to the tremendous growth of information seekers, using web. Users are able to access this material from a computer at their work place or from home in a network environment. Information is accessed through wearable devices, wherever and whenever they want. Since the information needed by users is delivered to the desktops, it demands a complete revamping of infrastructure of the library. Libraries started functioning on 24/7 bases. This has forced the traditional librarian to improve his technology skills.

As libraries shift more services to the Internet, the library web site becomes increasingly important as a product 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 marketplace, make it possible for librarians to introduce IT products and services to fulfill information needs of their customers. Libraries in advanced countries have undertaken digitalization projects to convert their national in-prints into digital formats. Some made them available through the Internet. Library as "reservoir of knowledge" must market its IT products and services in order to reach out to its potential users. Introducing IT products and services as an integral part of library services, accompanied by good advertisement as well as introducing systematic user education programs will encourage library users to come to library.

IS LIBRARY AND INFORMATION SERVICE MARKETING IS SOMETHING DIFFERENT?

As said in marketing, "It is no longer enough to satisfy customers. You must delight them." The fundamental principal of marketing is same whether one has to market a product or service in traditional marketplace or marketing of information services by libraries.

Marketing is typically seen as the task of creating, promoting and delivering goods and services to consumers and businesses. In fact, marketing people are involved in marketing 10 types of entities. They are:

Goods, Services, Experiences, Events, Persons, Places, Properties, Organizations, Information and Ideas. Marketing of library and information services also involve in most of these entities.

Libraries have **goods** such as sources of information and knowledge contents that are available in traditional print formats as well as electronic forms such as books, CDs, videos, journals, journal articles, data bases, films, audio digital products, online publishing, public domain and commercial online databases available through Internet and other propriety databases available through various private network providers. A number of libraries have subscribed to Information sources in CD-ROM.

Than libraries have different types of library **Services** as well like public library service, academic library service, workplace information centres, advisory services, business consultancy services, subject gateways and organisational web sites.

Working in a hi-tech library, using state of the art infrastructure and receiving information lightening fast can be an **experience** which will attract more and more customers to your library.

Organizing book fairs, seminars, group discussions, lectures and workshops are few of the **events**, which draw library customer's attention towards this knowledge hub. This is also one of the ways of marketing its product and services.

Finally, libraries are considered as **Information** Power House. They collect, process and disseminate information in such a refined way that it reaches the user within no time. Marketing of libraries broadly depend upon efficiency of library staff in information processing.

MARKETING MIX OF LIBRARY AND INFORMATION SERVICES

Marketers use numerous tools to elicit desired responses from their target markets. These tools constitute a marketing mix. It requires a critical analysis of the marketing mix to identify the nature, features, benefits, and value of the products to the customer. The development of an effective marketing strategy requires the specification of the marketing mix. These concepts are utilized in the for-profit sector, but a good library-marketing plan will also profit by examining products offered and assessing the value of the products to the users. One such tool is called four Ps of marketing: product, price, place and promotion. These Ps can be analyzed in the context of library and information services marketing.

PRODUCT

The products or services of the libraries can be marketed by general reference and information service department. This is, of course, the information, reference, and ancillary services that add value such as personal assistance, referral services, online database searches, document delivery, and interlibrary loan.

PRICE

Pricing of the product or service means the time and effort the user spends traveling to the library, as well as the time and effort spent searching for and examining materials and cost of a foregone alternative activity. In both the cases the time spent must be reduced to minimum in order to increase the marketability of the library.

PROMOTION

Promotion includes utilizing persuasive information about general information services, and communicating this information to target market segments that are potential users. Five kinds of promotion include: publicity, public relations, personal representatives, advertising, and sales promotion.

PLACE

Place of service is essential in order to identify users and their discrete information needs and wants. Also, this location element has effect upon how the library can best access their product offerings. To expand the service area, the library may have branches, bookmobiles, or electronic access, FAX, and telephone calls, etc.

BARRIERS IN THE MARKETING OF LIBRARY AND INFORMATION MARKETING

Most librarians do not market their library products, since they do not know how to market, or do not know how to do it well. The following are the barriers in promoting library and information service products.

MONEY AND ATTITUDE

Lack of funds is often used as a reason not to market. However, marketing library services is not simply a matter of spending money on promotion and advertising. Marketing is also a matter of improving the customers' experience of library services. Since the library staff interacts with customers, their attitudes have to be changed in such a way to understand what shapes customers' experiences and how to market library services to those customers. Majority of library staff do not have positive attitude.

LACK OF TRAINING AND EDUCATION

Often librarians do not promote library services well due to lack of training and knowledge of marketing tools and techniques. Despite

the growing literature on library marketing, there remains a lack of familiarity with the total marketing concept among librarians.

PASSIVE VS. ACTIVE STANCE

Rather than selling the library on its value and let the people to know what the library or information center offers, librarians often wait for customers to come to them. Rather than pushing out responses to anticipated information needs to customers, librarians wait for customers to stop by the facility or stumble across the library web site.

CONFUSION

There is confusion about what the term marketing means. Much of this has to do with the interchangeability of terms such as 'promotion', 'public relations', 'publicity', and 'marketing'. There is also confusion about marketing libraries; the perception is that marketing is a business tool and not applicable to library settings, exists in this context.

Complex and complicated task: Marketing is a complicated problem for libraries because of their wide range of products and services from books to Internet access, and an extremely diverse audience that ranges from children to seniors, public officials to businessmen, students to faculty, and so on.

CONCLUSION

Marketing is 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 objectives. Libraries also need to provide services to an increasingly sophisticated and demanding user by providing access to the information that people and organizations need in a timely, convenient, and equitable manner. Sooner or later, all librarians and information science professionals have to realize the importance of marketing concepts because library is no longer just a warehouse of information. It is fast changing the powerhouse of information where speed and accuracy is all what matters.

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Marketing of Library Information Products and Services

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ABSTRACT

The paper outlines the definition, subject matter and marketing of library information products and services. The application of the four mix element namely product, price, place and promotion in the library and information context has been discussed.

INTRODUCTION

Marketing has been one of the oldest professions. Of course the formal study of marketing started only in the 1920's. Marketing has been maligned and misunderstood for most of its existence as wasteful, intrusive and unprofessional. It is also equated sometimes with advertising or selling. These activities and many more are part of modern marketing operation. Perhaps one can be successful in marketing by giving the customer what he wants at the right price and by making it available at the right place and at the right quantity.

DEFINITION

Several definitions are available in the standard literature of business administration for instances. Philip Kotler[1] a well known marketing scholar and writer, defines marketing as ".....those human activities directed at satisfying needs and wants through exchange processes". In the words of Stanton[2] "marketing is a total system of interacting business activities viz to plan, price, promote and distribute want -satisfying products and services, and to present these to potential customers". According to Prof. Hensen[3] "Marketing is the process of discovering and

translating consumer needs and wants into product and service specifications, creating demand for these products and services and then, in turn, expending this demand." Marketing can more appropriately be defined as "Marketing is 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 objectives. It relies heavily on designing the organization's offering in terms of the target market's needs and desires, and on using effective pricing, communication, distribution to inform, motivate, and service the markets[4]."

SUBJECT MATTER OF MARKETING

From the definitions it can be revealed that marketing as a process related to an exchange and marketing management is the set of activities that facilitates this exchange. It is valuable to all organizations-profit-oriented or non-profit oriented public or private. Thus exchange, that too, voluntary exchange has been the central concept underlying marketing. Through exchanges, various social units, individuals, small groups, organizations, whole nations, attain the inputs they need and both the parties involved see themselves as better of after the exchange.

So far as the subject matter of marketing is concerned, Whitley[5] describes five aspects of marketing, based on the premise that marketing is what it does:

(a) Understanding customer needs and desires,

(b) Development of need-satisfying products and services,

(c) Development of informative and persuasive communication flows,

(d) Delivering products and services,

(e) Keeping customers satisfied after the sale.

MARKETING OF LIBRARY AND INFORMATION PRODUCTS AND SERVICES (LIPS)

Libraries have been ignored in much of the marketing literature published up to 1970. However, the issue of "to market or not to market" has been discussed in library journals after 1970. And it has been the subject of numerous library and information workshops. Annual Review of Information Science and Technology had no article on this subject until 1978. A full chapter on marketing theme in this Annual had been published first time in 1978. In 1975 Kotlers basic text, Marketing for Non-Profit Organization was published and in which Police Department, Municipality, Hospital, etc. were identified as audience. But 'Library' was missing from the list. It is highly significant that in the second

edition published in 1982 "Libraries" appears in the list. It is an outstanding acknowledgment that library profession is "into" marketing[6].The passage of time has conceptualized the marketing into library and information science by various authorities.

The library is suffering from rising costs because it has no profit making operations, and that it is the first to suffer because of diminishing support and grants. Like all other organizations, libraries are a grouping of people, materials and facilities seeking to accomplish a purpose in the world. In order to survive they need to attract resources from their donors or funders, they need to convert them to products, services and ideas and then to distribute them to a receptive, consuming public[7]. Raina[8] has suggested the following needs for marketing of LIPS: -

a) Information is a powerful tool for developments and shall have due importance for all the societies,
b) Information Technology has immense value for handling the knowledge of the world as a whole,
c) Increasing resources constraints particularly financial resources are a big difficulty to obtain by government support only,
d) Inadequate resources utilization resources in terms of knowledge available with libraries, if opened to the public in general can be utilized fully,
e) Increasing cost of information and IT which can be meant only through the finances generated through marketing,
f) Decreasing public sponsorship specially the higher education and research.

MARKETING STRATEGY IN LIBRARIES

Once marketing opportunities have been identified, a strategy must be formulated for taking advantages of them. Strategy in the broadest sense is a dynamic, action oriented blue print accomplishing the organizations mission, goals and objectives. Marketing strategy involves determining the level, mix and allocation of the marketing effort over a time.

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 components are subsets of the overall marketing strategy. Marketing mix or 4Ps namely product, price, promotion and place[9].

(i) **PRODUCT**- Consumer Needs and wants:

Kotler's[10] definition of product is "anything that can be offered to a market for attention, acquisition, use or consumption that might satisfy a

want or need. It includes physical objects, services, persons, places, organizations and ideas". The library and information centres provide a range of products and services to its community, including the collection, reference/information services, access to the collection and professional expertise, bibliographic instruction and other programming, and so forth. Some of the products are traditional and have been in existence for many years. Other products have been developed more recently, such as online searching, microcomputer for in-library use, and databases on CD-ROM, to name a few.[11]

The library's products can be arranged with the following three dimensional structures:

a) COLLECTION- Books, periodicals, videos and films, audio recording and CD-ROM etc

b) SERVICES- Circulation, interlibrary loan, online searches, reference service, CAS, SDI etc

c) PROGRAMS- Bibliographic instruction, displays, lecturers etc

(ii) **PRICE**- cost to the consumer

Price has various names in the society; fare for taxi, train; tuition fee for education, honorarium for lecture, rent for a house, and wage for a worker. From the customer point of views it is cost and is one of the major deterrents consumption of the product. Price is the amount we pay for the product or service. According to Kotler[12] price "is the amount charged for a product or services, or the sum of the values that consumers exchange for the benefits of having or using the product or service". Libraries are not free and that there is in most cases a large capital investment. Funding too is required annually to maintain the library. In times of declining budgets, libraries may find charges essential in order to remain viable. If such a situation does arise the fee for services will depend not only on the cost of the service, but on the price that the market is willing to pay. Price is an important concern of profit making and non profit organization. The non profit group may wish to set a fair price for its service or it may wish to become self sufficient through normal client fee rather than large gift from donors. Library first assesses the users to be served and their information and delivery requirements. The value of the current information products and services to the users and their ability and willingness to pay for each product/service currently offered can be assessed. Finally an assessment of costs can be made which are associated with each of the product/service and money required for running the Library. The major pricing strategies[13] are:

a) **Cost based pricing:**
This is derived by working out the cost, including overhead charges incurred on production.

b) **Demand oriented pricing**: It takes into the consideration what the market can bear, that is the perceived value of the information product. This allows price discrimination, such as a lower price for large consumers and different rates for graded demands.

c) **Competitor oriented pricing**: Here pricing involves an assessment of what competitors are charging to determine pricing policy. The options are to charge the same, to undercut or to present the service as better in some way, so that more can be charged.

(iii) **PLACE** – convenience to the consumers (Physical Distribution)

In the marketing mix elements, place or distribution refers to the creation of special utility to the consumers. It comprises of management of distribution channel and physical distribution of products. Physical distribution is set of interdependent organization involved in the process of making a product or service available for use or consumption by the consumer[14]. There are two dimensions of the physical distribution process-the flow of information from the individual consumer or organizer to the producer and to the consumer or the user. So far the library is concerned, place become a major issue for library service. Traditionally, place has meant the physical location of branch, academic and central libraries. Computerized networks, remote access through computer modems and electronic mail and delivery systems have changed the sense of place to include more than physical access to the library[15].Communication media such as mail, telephone, TV and computer terminals form important distribution channels.

(iv) **PROMOTION**- Communication with the consumers

After an information product or service has been developed, the price for it has been determined and the way to reach it to the users, at the place where they want it has been worked out, then the potential clients must know about the product or service. Without the basic information awareness they cannot act. Therefore the fourth "P" in marketing, after product, price and place stands for promotion[16]. Promotion is any marketing effort whose function is to inform consumer about the merits of a product or service for the purpose of introducing a consumer either to continue or to start purchasing the product or service at the same price. In general promotion as Philips Kotler[17] points out, involves one or more, or all of the following methods to reach the clients:

a) advertising,
b) sales promotion,
c) publicity, and
d) personal selling

Normally libraries are not involved in promotion activities, directly, but use advertising, point of sale displays, publicity and personal contact for existing users for expansion of their services. Brochures, leaflets, posters, newsletter are some methods for promotion of library information products and services.

CONCLUSION

Due to enormous growth of literature users have been find it difficult to keep track of the latest developments in the subjects of their concern. To overcome this problem, different kinds of information products and services have been started by libraries. In order to continue these product and services or bring about improvement, application of marketing mix is essential in libraries. If librarian does a good job of understanding user needs; develops products that provide superior value; and price, distribute and promote then effectively these products will sell very easily.

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Marketing of Library Services - BLOGGING

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ABSTRACT

This article concentrates terms, features, drawbacks of blog and how it can be applied for marketing the library services and beneficial for the library professionals. This will help for those who try to launch their blogspot to exhibit their individuality, creativity and service on the internet.

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Marketing of Library Services

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ABSTRACT

Marketing is not new to library but in the recent years marketing of library services has been gaining importance in libraries. It is whole business seen from the customer's point of view for its final result. The first requirement for successful marketing of information services is a clear appreciation for what marketing is and what it can do.

This paper defines the concept of marketing, the imperative need for library services and methods used for the library services. It outlines the principles for marketing of library products and marketing services. This article indicates the development of marketing of library services at national and international levels. The article also includes study of new IT based technologies for library services marketing viz., telecommunication, broadcasting and database technology, as the key elements in marketing process.

INTRODUCTION

According to Philip Kotlar, "Marketing is the analysis, planning, implementation and control carefully formulated programs 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 the terms of target markets need and desires, and on using effective pricing, communication, and distribution to inform, motivate, and service the markets".

The library services have been totally changed by the impact of new technologies and new methods. Marketing of library services is one to one interaction and exchange of value in which the users and library

professionals both gain something and it is the process of selling, advertising, promoting and distributing the services to satisfy the consumer's requirements profitable manner. It can help in developing the aim of library and determining the best way of provides services to customers. Marketing comprises a set of tools called the marketing mix, product design, pricing, communication and distribution.

I T BASED TECHNOLOGIES IN MARKETING OF LIBRARY SERVICES:

For marketing of library services, IT based products or services are very much influential to users in the long run. With experience and proper IT training, staff becomes the most knowledgeable and valuable asset of the library. The services of libraries are moving into the network based environment and website have become an important service of the library services. These services exist in many forms such as E-mails, web forms, E-books, CDs, videos, journals, journal articles, data bases, films, audio digital products, online publishing. Public domain and commercial online databases are available through Internet, other propriety databases and through various private network service providers. The advent of new technologies in telecommunication and broadcasting are making it possible to fulfill varied needs of users. Librarians should promote the use of IT as an integral part of library services. Marketing concepts and technologies can contribute to a dynamic approach to total strategy development, which is ensure effective management.

7P's of Marketing Mix in marketing of library services: A short term tool that helps with planning is the marketing mix. Product, price, place promotion, participants, physical evidence and process are seven Ps of marketing mix that can be applied in marketing of library services.

Product - Products or services of the general reference and information service department. This is, of course, the information, reference, and ancillary services that add value such as personal assistance, referral services, online database searches, document delivery, and interlibrary loan.

Price of Service - Pricing of use of the library is usually that of the time and effort the user spends traveling to the library, as well as the time and effort spent searching for and examining materials and cost of a foregone alternative activity.

Place - Place of service, based upon knowledge of the market of a library, is essential in order to identify users and their discrete information needs and wants. Also, this location element has effect upon how the library can best access their product offerings. To expand the

service area, the library may have branches, bookmobiles, or electronic access, FAX, and telephone calls, etc.

Promotion - Promotion includes utilizing persuasive information about general information services, and communicating this information to target market segments that are potential users. Five kinds of promotion include: publicity, public relations, personal representatives, advertising, and sales promotion.

Participants - All human actors who play a part in reference and information services delivery, namely the library's personnel.

Physical Evidence - The environment in which the reference and information services are delivered that facilitates the performance and communication of the service.

Process - The procedures, mechanisms and flow of activities by which the reference and information services are acquired.

PROFESSIONAL SKILLS FOR MARKETING OF LIBRARY SERVICES:

Excellent marketing skills and techniques are essential for a library and information center's success. For marketing, development and implementation of information literacy skills, digital literacy skills, media literature skills, critical thinking and problem solving skills and self-direction skills are needed. Professionals should know how to communicate well with users and be able to create a welcoming IT environment and build confidence in the users. Professionals should have perception of user's needs and should be able to obtain feedback from users.

INTERNATIONAL DEVELOPMENT OF MARKETING OF LIBRARY SERVICES: Increasing the interest of international and national associations such as the US- based special library associations has been giving attention to coverage on marketing in its programmes. It provides training and time-to-time publishes bibliographies on marketing. London based ASLIB published the first authentic text on Marketing of library and information services (Cronin, 1981). It also organizes short term-courses for library professionals and publishes papers. An annual conference held at Bostan launched "Campaign for the World's Libraries' at the international federation of Library association (IFLA). American Library Association has also published many useful texts on marketing. A bimonthly news letter on Marketing Library Services gives specific coverage on marketing of library services.

Many of the American libraries, Library and information sciences journals have brought the special issues on Marketing of Library Services, such as Library Trend 43(3), Winter 1995, Journal of Library Administration 1983, Information outlook 6(11), 2002, Computers in Libraries 19(8),1999 and ASLIB information 21(9), 1993. These journals have circulations in other countries also.

IFLA Marketing and Management Section in 1997, which comprises library professionals from all over the world, working actively in marketing and management in their libraries. IFLA is working for conceptualizing marketing in libraries, making efforts for developing guidelines to teach management and marketing, and other developments of interest to LIS professionals. It organizes annual conferences, training programmes, brings out publications, newsletter, and also has a discussion list for marketing of academic libraries. There are also various institutions/ agencies/ associations running short-term training programmes on different aspects of marketing.

Indian Scenario: In India, The Indian Library and Information Science Abstract (ILSA) started abstracting in this field in 80s. Indian Institute of Management, Ahmedabad has developed a database on Marketing of library services which is very helpful for researchers. The national professional associations and organizations, like Indian Associations of special libraries and Information Centers (IASLIC), Indian Library Association (ILA) Society for Information Science (SIS), Medical Library Association of India (MLAI) and Management Library Networks (MANLIBNET) are increasing their interest in the field for marketing of library services. IASLIC Organized the first national conference in 1988 (Kapoor & Chatergee, 1988) Society for Information Science (SIS), also selected the theme Information marketing for its conference in 1995(Kuldeep Chand, 1996).). Many associations in this area also conduct training programmes and workshops. DESICOC Bulletin of Information Technology has brought out special issues on marketing of library and information services twice in 1998 and 2002. A workshop on marketing of information product and services was organized on 27 November to 01 December 1989 at CSIR, New Delhi. The professionals like Annals (New Delhi), SREL Journal of Information Management (Bangalore), IASLIC Bulletin (Kolkata), ILA Bulletin (New Delhi), Herald of Library Science (Lucknow) and others regularly publish articles on the area of marketing of library and information services. . The topic of Marketing of Information and Library Services has been included in the syllabi of many universities in the country. INSDOC has made progress in this direction. The first step in this regard was establishment of a full fledge division on marketing and customer services. The services marketed by INSDOC are Literature search, Desk

Top Publishing (DTP), Citation Analysis of papers, Reprographic service, Translating service, Networking services and development of SIRNET etc.

IMPERATIVE NEED OF MARKETING OF LIBRARY SERVICES: -

In the age of information Technology library offers many services for marketing but the availability of right information to the right people at the right time at right cost is becoming all the more critical. To understand the need for marketing of library services can be analyzed under the following perspectives

1. **Customer's requirement:** In response to the ever-changing society different types of Information are available in print and non-print material. Because of these continuous changes, the traditional services are not sufficient for the users and they require new services.
2. **Demand of new services:** Due to the changing nature of the society and economy there is increase in demand for new kind of services, for which the marketing process is required.
3. **Effect of free economy:** In free economy, customer is more important. They purchase only what they need from the vast available material. This is because current and timely information is the key to sound decision-making.
4. **Increasing cost of information:** Due to the increasing rate of speed and cost of information, the marketing process is required.
5. **Information Explosion:** There is an information explosion, which has resulted into more and more publications in micro subjects areas, which has created a demand for marketing of library services.

HURDLES IN MARKETING OF LIBRARY SERVICES:-

Most of the librarians do not know how to market the library services. The barriers in promoting library and information services are:

1. Myth – People believe that libraries do not need to be promoted because in general, the importance of libraries is not clear to them.

2. Lack of funds- Lack of funds is a reason of not spending money for improvement and marketing the library services.

3. Attitude and communication- Library professionals need to learn different styles to communicate with diverse users and create a positive attitude as most users have negative image towards the librarians.

4. Complicate Task – Marketing of library services is a complicated task for librarian because of its wide range.

5. Fear- Librarians fear of commercial publicity and see marketing as manipulative, wastage of time and resources, and unprofessional for their profiles.

6. Old models – Sticking to old models bar the introduction of new ideas and implementation of new services some of such models are:

- Many librarians work on the old model of existence by order.
- Faculty should send their students to librarians for Support.
- Students should use library databases to locate quality information for their papers.

SUMMING UP

Libraries have enormous potential to earn revenue by marketing of library services. The main aim of marketing is to make the users know and understand that the library is able to satisfy their needs and beyond. The library can be called an information market and the library user is a consumer of information. Marketing of library services is an essential step in the planning, designing, and use of services for optimal use of information. Library acquisition and organization must be based on the modern concept of marketing to its user's satisfaction. Marketing of library services is the effective execution of all the activities involved in increasing satisfaction of users by providing maximum value to them. It is a total solution for library and information centers. My suggestion is that the librarian must develop a marketing plan and should include these services, i.e. user education programmes, packing of information, hyper linking relevant sites, meetings and seminar.

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Marketing of Library Services

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ABSTRACT

As librarian we should be active in promoting and marketing our library services through identification of needs and fulfilling the needs for users' satisfaction to survive in competition with the persons in Information Technology. For this we are to create Integrated Library Services (ILS) through Customer Relationship Management (CRM). The librarians should be responsible for ensuring that customers have a good confidence with the library be it public/academic. The paper aims to demystify marketing for librarians. Practical solutions are provided on how to implement a marketing strategy with particular emphasis on the 'human resources development' and 'total quality management'. As library leader, you can transform your library using these clear and comprehensive guidelines.

INTRODUCTION

Marketing is the concept of selling of the goods and services for the satisfaction of the end users' needs and continuous support to them for the development of the customer relationships. It involves: i) identification of the customer needs, ii) fulfilling these through ideal products and services, iii) creating the potential customers, iv) sale and v) after-sales-services for ultimate customer satisfaction. Marketing is frequently viewed as a set of strategies and techniques for studying the characteristics and extent of the market for a product/service or a group of products/services to predict future trends that gives edge over the competitors in the particular field. As the librarians we all participate in the process of assessing our users' needs and trying to fulfill them. In a library the readers/information seekers are our customers and we are to satisfy them through our skills for our existence and viability in competition with the persons in Information Technology.

IDENTIFICATION OF THE USERS' NEEDS:

Identification of the users' needs involve: a) providing the proper infrastructure to the users so that it can help them to find themselves the actual services he needs for the library; b) good communication facility

that would help them to communicate their needs to the service providers; c) helping them in their expression of the actual need by providing supporting knowledge related to the needs. Suppose, a user has come with the requirement of some documents for promoting a business of some FMCG. But he does not know which particular documents would help him in finding out the knowledge regarding the business environment of the particular place. Librarian is the person who can help him in this juncture. Identification of the community needs and equipping the library as per the identified needs also very necessary.

PROVIDING SERVICES:

The Librarian's next task is to provide the documents and information through searches whenever he finds out the actual needs of the information seekers. For this, he would have to search book/non-book materials. Nowadays, the information technology provides him many necessary help. This should be done within a very short period of time. This field is very dynamic and latest information only can help the seekers in fulfilling their needs.

CUSTOMER RETENTION:

Once the need is fulfilled, the library user would have various other related information needs to complete his total satisfaction. In that case the library and library professionals should establish a personal direct relationship with the users. The librarian should create such an atmosphere so that the users' confidence on the library grow and consider the system dependable. Here the librarian would have to act as a barber. Barber has to satisfy his customer by shaping the hair which is of various statures and the customer becomes loyal to him for the rest of his life.

CREATING THE POTENTIAL LIBRARY CUSTOMERS (PROMOTION):

Essentially promotion is the way of informing your users what you do and what you can do. The benefits are to promote the service for increased usage, increased value in the organization education of users and changed perceptions. According to John Cotton Dana there are Ten Commandments for promoting the library:

- Send circulars advertising the services of the library to the editors of a variety of local and national journals and newspapers;
- Make personal visits to every editor and every leading personalities in the community;
- Reach out to the business community by developing a business library in the Chamber of Commerce building;
- Establish the children room in the library;

- Grant teachers the opportunity to check out up to 50 books for use in the classroom;
- Develop a picture collection of art works and illustrations and lend these to schools for art classes;
- Collect foreign language materials that reflect the ethnic groups in the community;
- Provide meeting room space to local clubs;
- Publish a monthly newsletter about the library;
- Develop an apprenticeship programme to train inexperienced staff.

HUMAN RESOURCES:

The library can sustain if it becomes successful in providing services to its community it serves. Active participation by the librarians in the changing set up is very much essential over and above the goodwill and approval of the community. To be competitive with other information providers (like IT sectors); librarians have to offer customers premier access to information technology-without bureaucratic red tape. Every employee is responsible for ensuring that users have a good experience with the library.

In the digital environment, the workload of the librarians has decreased. The technology has helped the librarians to provide the information within the very short period of time. In the digital era, librarians must be able to work with digital media as easily as they have worked with paper. They must be able to create electronic collections, including the ability to select, acquire, describe, organize, reference, and preserve these digital works.

Now the question is what are the practical, technical skills that all library and records professionals must have to work with e-books, electronic records, and other digital materials? Certainly they need skills that go beyond those of the consumer of records, but it seems unreasonable to expect them to have the skills of a professional programmer or systems administrator. When new technologies are applied there are opportunities for job redesign and for organizational restructuring. With the integration of computer systems, increased automation reduces the need for human physical effort, but increases the need for intellectual ability. I suggest the anthropocentric approach instead of incorporating almost all knowledge and the sequence of disseminating knowledge as far as possible in the computer system, in this case the computer serves as a general and consistent information system, also performing routine operations but leaves the planning of working actions to the librarians' skill.

TOTAL QUALITY MANAGEMENT (TQM):

TQM is a major management philosophy that embodies the major aim of satisfying customers' (users') requirements as efficiently, to improve performances continually as situations allow, and to ensure that all works achieve the library's objectives and are completed right first time. TQM is achieved in the following way (some of these I have discussed already in the HR paragraph):

- ✓ Training and development
- ✓ Quality and commitment of the library professionals
- ✓ Top management commitment to TQM
- ✓ Staff involvement and a flexible mode of operation
- ✓ Strong cultures to which library staff members subscribe.

VALUE ADDED SERVICES:

The market demand for quality data and shelf-ready library services has ever been higher. Meeting that demand is now a primary factor in maintaining the viability of the library. To add value to the services-

- prepare high-quality MARC 21 record
- start shelf ready processing service
- install user friendly cataloguing software
- use high quality printed stock
    - ❖ spine labels
    - ❖ barcode labels
    - ❖ reading programme labels
    - ❖ cards
    - ❖ pocket labels

CONCLUSION:

In the public sector, the widespread implementation of CRM (Customer Relation Management systems as tool for delivering e-government has led to services and systems being oriented around the citizen and their interaction with local government services. In academic institutions the fee-paying students are also increasingly the 'customer' around which appropriate services and resources must be built. As librarians we should be active in marketing and promoting our library services. The basic aim of marketing is to know and understand our users either in public library or in academic library, and the library is able to satisfy those users' needs in an effective way. A marketing plan is an essential tool which will enable us to focus our efforts. The market plan should assess where we are now (market research), where we are going (objectives) and how we are going to get there (strategies). Competitive conditions facing an organization can lead to changes in working practices, habits, culture and redesign of work. To prepare the library staff for such an eventuality, we can resort to training with the emphasis on development to maintain or enhance the quality of the operations and output.

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Planning for Information Security

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ABSTRACT

The economics of information security has recently become a thriving and fast moving discipline. Organizations now have more data than they know what to do with; consequently it is difficult to secure information. In today's world, business is increasingly globalizes and work is increasingly virtual and collaborative. For effective work and successful business, security of information is a must. The immediate need for organizations to protect critical information assets continues to increase. This paper deals with important components of planning of information security.

KEYWORDS: Information security, WITSA, Information security checklist

INTRODUCTION:

Information Security is the protection of information assets that use, store, or transmit that information from the risk of loss through the application of polity, education and technology. Information has changed the way we do business, and is present in every aspect of the economy from banking and finance, transportation and utilities, to food production and distribution, government, and nearly everything else of importance to economic and physical well being. In an automation-reliant society, there is no real physical or economic security without information security.

Good information security means provides accessibility to information and data to appropriate users while simultaneously protecting confidentiality of information and data and minimizing vulnerabilities to attacks and threats. Good security practice is driven by eight constructs. The eight constructs capture the security practices that contribute to highly security information. They are:

1. Vulnerability: Potential for data and networks to be tampered with, attacked, or destroyed

2. Accessibility: Availability of data and networks to appropriate users
3. Confidentiality: Protection of confidential corporate data and privacy of data about individuals
4. Information Technology (IT) Resources for Security: IT Resources for supporting data and network security practices
5. Financial Resources for Security: Financial Resources for supporting data and network security practices
6. Business Strategy for Security: Business Strategy for setting the direction and agenda for data and network security practices
7. Security Policy and Procedures: Stated data and network security rules and procedures
8. Security Culture: Supporting environment for implementing data and network security practices business process stage and at every level within the organization.

NEED FOR INFORMATION SECURITY:

Information security must change with the evolving business climate. As the global economy offers greater opportunities to expand into new markets, organizations are becoming distributed and business models are becoming more collaborative. This, no doubt, introduces another set of challenges for managing information assets that are not only growing in volume, but also in complexity.

Strong security is paramount to succeeding in this round-the-clock, global business climate. Organizations must, therefore, understand the environment in which information security operates and the problem it must address.

1. Protecting the organization's ability to function
2. Enables the safe operation of applications implemented on the organization's systems
3. Protects the data the organization collect and uses
4. Safeguard the technology assets in user at the organization

Threats, or dangers facing an organization's people, information, and systems fall in to the following twelve general categories:

- Acts of Human Error or Failure: Acts performed without intent or malicious purpose by an authorized user (these are the reason why employees constitute one of the greatest threats to information security)

- Compromises to Intellectual Property: Use of another person's intellectual property without proper payment or attribution to the source.
- Deliberate Acts of Espionage or Trespass: Acts involving an unauthorized individual gaining access to the information an organization is trying to protect
- Deliberate Acts of information Extortion: Acts involving an attacker or trusted insider stealing information from a compute system and demanding compensation for it return or for an agreement not to disclose the information
- Deliberate Acts of Sabotage or Vandalism: Assaults on the electronic face of an organization that is, its Web Site.
- Deliberate Acts of Theft: The illegal taking of another's property
- Deliberate Software Attacks: Attacks that occur when an individual or group designs and launches software, such as viruses and worms, to deliberately attack a system.
- Forces of Nature: Events resulting from forces of nature, or acts of God and posing some of the most dangerous threats as they are often unexpected and can occur with very little warning
- Deviations in Quality of Service: Situations in which a product or service is not delivered to the organization as expected.
- Technical Hardware Failure or Errors: Failures of errors that occur when a manufacturer distributes equipment containing a known or unknown flaw.
- Technical Software Failure or Errors: Failure or errors that occur when a manufacturer distributes equipment containing a known or unknown flaw.
- Technological Obsolescence: State of organization having infrastructure that is antiquated or outdated and can, therefore, lead to unreliable and untrustworthy systems.

Categories of Threat	Examples
Acts of human error or failure	Accidents, employee mistake
Compromises to intellectual property	Privacy, copyright infringement
Deliberate acts of espionage or trespass	Unauthorized access and/or data collection

Deliberate acts of information extortion	Blackmail or information disclosure
Deliberate acts of sabotage or vandalism	Destruction of systems or information
Deliberate acts of theft	Illegal confiscation of equipment or information
Deliberate software attacks	Viruses, worms, macros, denial-of-service
Forces of nature	Fire, flood, earthquake, lightning
Deviations in quality of service	ISP, power, or WAN service issues from service providers
Technical hardware failures or errors	Equipment failure
Technical software failures or errors	Bugs, code problems, unknown loopholes
Technical Obsolescence	Antiquated or outdated technologies

Fig 1: Category of threats with examples

CHECKLIST FOR INFORMATION SECURITY PLANNING:

Topical problems of modern business are: how to cull right information from its abundance, how to decide which information is valuable and which one is useless, how to assess the quality of the usable information, finally how to secure the information. These problems are relevant and important both globally and locally in modern business. Handling complex and difficult Privacy and Information Security issues has moved to the top of the list for companies. However, there are often gaps in communication and coordination between Privacy and Information Security activities. These gaps create more complexity and bigger challenges for companies to handle. Here some steps are given below to plan Information Security.

Step 1. Have a Security Policy.

Establish information security policies and practices to ensure the uninterrupted security of information systems. For example:

- Have a written security plan that addresses all areas of organization operations?

- Have policies appropriate to our size and complexity, organization activities, and the sensitivity of the information that organization handle?
- Understand organization security policy and the reasons for it - at all levels of organization operation?
- Have signed confidentiality agreements with all employees?
- Continually review organization policies and practices?
- Spend enough money on security tools and staff to do the job right?
- Use outside specialists to review organization security system, perform risk assessments and audits, and help with compliance?
- Have liability insurance to cover possible security breaches?
- Have a data recovery plan in case of a natural disaster? Do we test it periodically?
- Have a plan that outlines how to deal with security incidents or information compromises?
- Have a resolution system for disputes arising from security breaches or alleged misuse of sensitive information?
- Report cyber attacks to law enforcement agencies?

Step 2. Train and Supervise for Security:

Institute vigorous training and oversight of your designated security team. But don't stop there. Any other employee or contract worker with even occasional access to personally identifiable information must be trained and supervised. For example:

- Have a full-time, designated team to develop and implement information security throughout organization? Does it have the resources and support it needs to do the job right?
- Have effective and up-to-date training tools?
- Conduct regular security audits and response exercises?
- Rank data by level of sensitivity and assign access rights accordingly?
- Conduct background checks on new hires, who have access to medical, financial and other forms of sensitive data?
- Review security policies and responsibilities with new hires and periodically thereafter?

- Keep records of information accessed and regularly monitor those records for unusual activity?
- Adjust security passwords and other protocols promptly when employees leave?
- Make all employees aware of the penalties for security breaches?

Step 3. Use Available Technology to Guard Personal Data.

Written policies and training go far, but not far enough. Construct structural and technological walls to contain personal information and run tests to ensure that the system works. Make contingency plans. For example:

- Define organization security needs and use technology that meets those needs, point-by-point, specification-by-specification
- Include layers of complementary solutions to prevent and detect unauthorized use of information systems
- Use the latest, updated virus protection
- Respond quickly to security "alerts" from software vendors
- Erect firewalls to safeguard personally identifiable information
- Combine numbers and symbols in passwords and change them regularly
- Use authentication or biometric measures, if appropriate, to verify user identity
- Grant access to personal data only after the user's identity has been positively authenticated
- Test security for data in transit or in storage against pre-set specifications? Do we require software providers to pre-test software before release?
- Review audit logs for evidence of intrusions
- Test for and correct known network and application vulnerabilities

Step 4. Access Controls and User Permissions

- Have you employed effective access controls to restrict access to sensitive information and data and prevent and detect unauthorized access?

- Do employees have the authority to only read or modify those sensitive information and data that they need to perform their duties?
- Do outside contractors have the authority to only read or modify those sensitive information and data that they need to perform their duties?
- Do you have a workable procedure for assigning user access rights and permissions?
- Have you established a process for reviewing the appropriateness of individual access privileges?
- Does your process include a comprehensive method for identifying and reviewing all access rights granted to any one user?
- Do you frequently/periodically review access rights and permissions to ensure that access remains appropriate on the basis of job responsibilities?
- Does your user access scheme guard against heightened vulnerability that can result from users that are system developers who may have detailed knowledge of the systems' processing functions that could allow them to improperly add, alter, or delete critical financial and sensitive information or programs, possibly without detection?
- Have you adequately restricted users from viewing sensitive information?

SUGGESTED PRINCIPLES:

The World Information Technology and Services Alliance (WITSA) is a global alliance of national and regional information technology (IT) industry associations from 67 economies around the world. Founded in 1978 and originally known as the World Computing Services Industry Association. WITSA members represent over 90 percent of the world IT market. WITSA member represent in India is National Association of Software and Service Companies (NASSCOM). As the global voice of the IT industry, WITSA is dedicated to:

- Advocating policies that advance the industry's growth and development;
- Facilitating international trade and investment in IT products and services;

- Strengthening WITSA's national industry associations through the sharing of knowledge, experience, and critical information;
- Providing members with a vast network of contacts in nearly every geographic region of the world; and
- Hosting the World Congress on IT, the premier industry sponsored global IT event.

WITSA has increasingly assumed an active advocacy role in international public policy issues affecting the creation of a robust global information infrastructure, including: increasing competition through open markets and regulatory reform; protecting intellectual property; encouraging cross-industry and government cooperation to enhance information security; bridging the education and skills gap; reducing tariff and non-tariff trade barriers to IT goods and services; and safeguarding the viability and continued growth of the Internet and electronic commerce.

In developing industry positions on global Information security issues, WITSA suggests an initial list of general principles that should guide the development of future policy.

4.1 Joint Principles

- The Internet and electronic commerce are inherently global in nature; therefore, information security will require collaboration among international bodies and recognition by government of the challenges faced by industry in these areas.
- Industry and government share an interest in the proliferation of a free and open
- Internet, electronic commerce, other value-added networks, and an efficient, effective information infrastructure generally.
- Positive interaction between government and industry is essential. Among issues that will require on-going communication and assessment is the need to balance an individual's right to privacy with national security concerns.
- Emergency response organizations must gain sufficient situational awareness and disaster recovery expertise to minimize the effect of catastrophic events on the information infrastructure.

4.2 Government Principles

- The assurance of national information infrastructure must be based on the minimum amount of government (national, state/province, and local) regulation as is feasible.

- The cost of protecting national information infrastructure must be kept at a level commensurate with the threat and the consequences of attack.
- Governments must work together internationally to coordinate their own Information security and critical infrastructure assurance programs and activities.
- Where corrective information security action is required to protect the public good, government must identify such instances and create appropriate research, development and funding mechanisms
- In creating and maintaining the information infrastructure and its associated tools and technologies, industry must be provided safe harbor assurances when it has made reasonable efforts and its works viewed as incidental to losses caused by criminal or malicious misbehavior or natural disasters.
- Distinctions must be made among cyber-mischief, cyber-crime and cyber-war to clarify jurisdictional issues and determine appropriate responses. The adequacy of current laws to prevent these threats must be reviewed.
- Existing laws must be adapted as necessary to allow appropriate levels of information sharing among companies, and between the private sector and government.
- Current policy in areas such as the tax credits for research, software encryption, workforce training and long-term government research and development funding must be reviewed in light of common information security goals and objectives.
- Law enforcement agencies on a global basis must gain sufficient cyber-crime expertise to combat specific threats and to investigate specific criminal acts. Also, legal statutes must be updated since in some countries cyber crime is a novelty unrecognized by criminal statutes while the possibility of such crimes being committed is real.

4.3 Industry Principles

- Industry owns and operates most of the world's information infrastructures, so should have primary responsibility for information security requirements, design and implementation.
- Industry will be guided by business continuity considerations to protect itself against physical and cyber-attack as the threats to the information infrastructure grow.

- Industry should cooperate both internally and with government in reporting and exchanging non-proprietary information concerning threats, attacks and protective measures. Coordination among principals must facilitate creation of early warning systems.
- Make security a top priority, and put security at the heart of the design process, and where possible, use government, industry and international standards.
- Work with home users, small businesses and large enterprises (including government agencies and educational institutions) in a continual process of improving the security, maintenance and reliability of products that maximize users' productivity.
- Continue to improve the engineering, development, testing and training processes and methods that reduce defects in systems specification, design, implementation and remediation (patching). Partner with government and academia to develop automated tools for evaluating software quality and security.
- Identify, adopt, train and deploy information security best practices with clearly assigned cyber security roles and responsibilities for all employees and organizational leadership.

CONCLUSION:

It is necessary that future practitioners in these fields gain an understanding of the principles of information security because security issues are likely to affect their own industries and careers. To develop more secure information environment in the future, the organizations are counting on the next generation of professionals to have the correct mix of skills and experience necessary to anticipate and manage the complex information security issues that are sure to arise.

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Surfacing a New Platform in MLIS
A pathway of Gen-Next library system

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ABSTRACT

Marketing management has been expansively implemented in manufacturing & service industry for over a decade. Now a day's marketing as an apparatus is becoming prolific for every industry & service to accomplish required goals and objectives. As we all know marketing is used to create customers (users), to gratify the customers and to retain the customer. It is the "science of strategy" and its main objective is to make customer satisfied, so it is obligatory for the librarians to act passionately on marketing applications. This can be done in LIS (Library & Information Services) by using service marketing. Marketing of services in LIS can be done through online as well as offline platform in different institutions & organizations. Telecommunications, Information Technologies and Database Technologies have been acting as key elements in service marketing.

Marketing of LIS plays an essential role in today's era because of users need & demand which can be fulfilled either by online services or reprographic services. To enhance the marketing services in LIS at different Institutions and organizations, it is important to have services on subscription basis & priced publication basis.

In this paper we are trying to find out the practical solutions provided on how to employ the marketing strategy in LIS to provide a quality based services in different libraries across the nation. It helps to establish a positive image for the library in the community, and determine the best way to provide a

quality services to users. It also shows the relationship between promoting library services and raising the silhouette of the library.

Keywords: Service marketing, MLIS, Library Environment

INTRODUCTION

Marketing is an incorporated progression through which organizations create values for customers and build strong customer relationship in order to capture value from customer in return. Thus the quintessence of marketing involves finding out what the users want, then setting out to meet those needs & wants. The role of the librarians is to help in assessing the user's needs and then trying to accomplish them. In order to do this effectively librarians need to squeeze the total marketing function involving service planning and promotion. *MLIS* (marketing of library and information services) is the way of planning, organizing, promoting and distributing library products & services to create smooth connections that satisfy the library and the users. MLIS is the process which determines the decisions and actions involved in meeting the needs of the customers. MLIS requires watchful planning and begins with understanding the mission of the library [1,2,8].

OBJECTIVE OF THE STUDY

- To take an outline of Marketing of Library and Information Services*(MLIS)*
- To study the stumbling block of *MLIS*
- Suggesting practical solution to implement marketing strategy in *LIS*

RESEARCH METHODOLOGY

This is an empirical paper in which the data is collected from secondary sources such as *Journals, Magazines, Newspapers, Case studies, Hypertext etc.*

MARKETING AS A DRIVER

In the last few years, the products and services provided by librarians have changed considerably. The challenges to library services from changes in educational approaches, the impact of technology, new methods for information provision and declining budgets have meant that marketing is now so basic that it cannot be considered a separate function. It is the whole business seen from its final results that is from the customers perspective. In determining new approaches, many librarians have come to appreciate the contribution of an application of marketing concepts, tools & techniques. Any library using marketing plan, the 4 P's have become central to libraries. Any library using marketing techniques to develop its operations focuses on its products or

services, the price paid which may be in terms of money, time or energy. Service marketing in particular reflecting the mutual interests of libraries and the customers they serve is being seen as a concept of libraries to embrace. In developing and maintaining a healthy relationship, it is essential that all the users are identified and their needs understood [2,3,9].

Product marketing versus service marketing

Many Organizations/Institutions know how to market products, but it is trickier to market services. Here are some points which are necessary to understand about the differences between products and service marketing.

a) *When any organization or institution is marketing a service, they are really marketing relationship and value. This relationship and value needs to be marketed differently than if they are marketing actual products.*

b) *When a buyer purchases a service, the buyer is purchasing something that is intangible.*

c) *Consumer's concept of a service if often times based on just the reputation of only one single person. Instead of building a reputation based on the quality of a number of different products, a service is built on how well a particular person delivers on a service, such as how well a stock advisor does with your stock portfolio.*

d) *It is pretty easy to compare the quality of different products. However, it is much more difficult to compare the quality of similar services that are provided [9].*

HOW TO MARKET SERVICES

Generally speaking marketing a product requires what are known as the 4 P's –*product, price, place and promotion.* Marketing a service adds three more P's to the traditional 4 P's – *people, physical evidence and process.* Service marketing also includes marketing what is known as the service escape, which is the aesthetics of your work place: the outside of your work building, the inside of you work building, and the way that the users look [1,8].

CALL FOR *MLIS*

In a good library major share of the stock/facilities are kept unutilized within an organization/institution. Side by side the views facility and the modern technology for an effective library services needs capital investments and year to year recurring expenditure as well as capital expenditure in library. This in turns demands an effective utilization of

resources within and marketing its surplus facilities to the prospective users/buyers to compensate the expenditure/earning. As such marketing of library services is an elite type of marketing and needs to be handled sophisticated [4].

Why there is a need for MLIS?

- Customer's eminence based requirements
- Dearth of necessary resources such as Infrastructure, Volumes of Text Books, Foreign publications, Journals, Case Studies, Research Papers etc.
- Maintaining relevant study materials
- Visibility
- Rising anticipation of the users in terms of quality at reasonable prices
- Advantageous to library picture [4].

IS PUBLICITY OF INFORMATION DIVERSE?

There are different types of library services such as public libraries, academic libraries, workplace information centre, advisory services, business consultancy services etc. *MLIS* based products and services refers to sources of Information and knowledge contents that are available in reprographic forms or in electronic forms such as CD's, e-journals, audio digital products, online publishing which is available through Internet and other private network providers.

Stumbling Block to *MLIS*

Librarians from various Management & Technical Institutions do not know how to market the products of their library in a smooth way, since they don't know how to do it well through the use of MLIS. The following are the points which create hurdle in promoting library and information service products.

a) Paucity of training and education

Many librarians do not promote library services well due to the lack of training and knowledge of marketing tools and techniques. The librarians should know how to deal with the marketing tools and techniques only then they can handle the situation.

b) Complexity

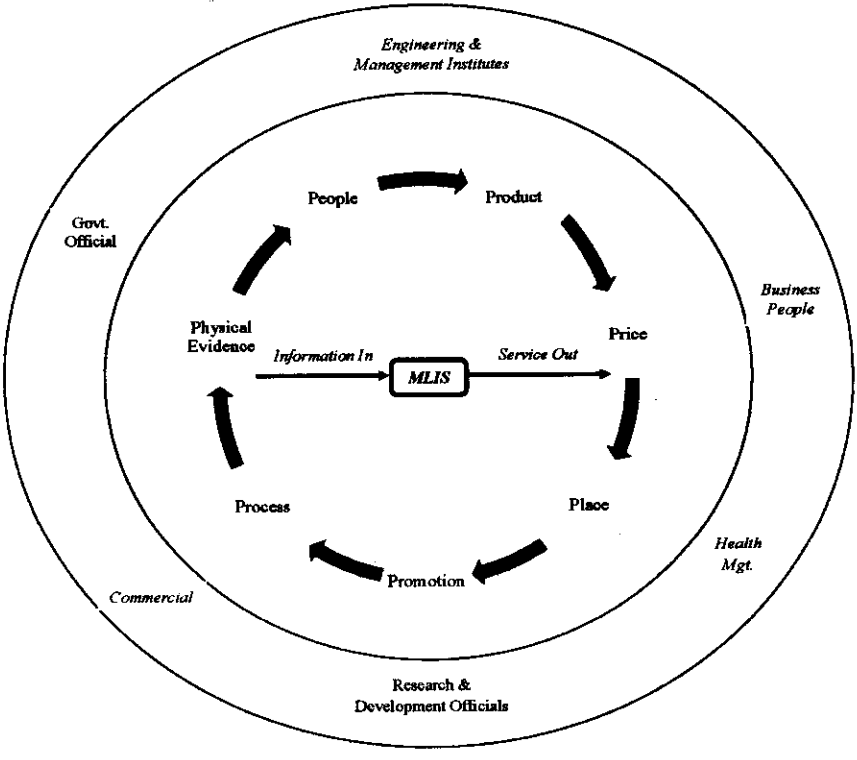
Marketing of services is a thorny problem for librarians because of their extensive range of products and services from text books to Internet access. It becomes also very complicated because of an enormous diverse audience that ranges from children to seniors, public officials to business tycoons, students to faculty and many more.

c) ***Scarcity of funds***
Scarcity of funds is often used as a rationale not to market the library services. However, marketing library services is not merely a matter of spending finances, promoting and advertising. It is a subject of improving the customer's experience of library services.

MILS & Marketing Mix

The marketing mix is a muddle of 7 P's – *product, place, price, promotion, process, people & physical evidence.* The enlargement of an effective marketing strategy requires the specification of marketing mix. MLIS requires a decisive analysis of the marketing mix to identify the nature, features, benefits and value of the products to the users. Good library marketing will also yield by probing products offered and assessing the value of the products to the users [4].

Figure1: Marketing Chakra for library and information service



The above figure depicts a marketing chakra for Library and Information Service wherein the information should be made available to the library

and then a concrete & quality based service is provided by the library personnel. The above information can be utilized by various Engineering & Management Institutions, Government Officials, Research and Development officials etc.

7 P's in Marketing Mix Table 1:

7 P's	Description
Product	*The product or services in library is of course the information, reference and ancillary services that add value such as referral services, online data base searches, document delivery and inter library loan or subscription.*
Price	*The pricing in library services involves such as journals, foreign publications, research papers etc. which are very costly in terms of price and not affordable for many users. Pricing should in accordance with the quality of the material. Patent search should be also of high cost.*
Place	*Infrastructure or the place of service is essential in order to identify users and their discrete information needs and wants. This location has an effect upon how the library can best access their product offerings. For expansion of the service space, library must have branches, reprographic services, online services or electronic access, fax etc.*
Promotion	*Promotion includes: publicity, personal representative, public relations, advertising and sales promotion. On the basis of this promotion includes utilizing information about general information services, and communicating this information to the potential users.*
People	*All the users such as children to seniors, public officials to business people, students to faculty and so on who plays a vital role in reference and information service delivery, namely the library's personnel*
Process	*The mechanisms, procedures and flow of activities by which the reference and information services are acquired.*
Physical Evidence	*The environment in which the reference and information services are delivered that facilitates the performance and communication of the service [2,5,8].*

SWOT Analysis

STRENGTH	WEAKNESS
Facility are available and we can think only it is surplus for the physical stock. Reprographic/e-journal/searching/case studies/foreign publication and expert guidance	*The market of MLIS is unexploded. There is risk in marketing of Library and Information service. Cost of implementation and availability of experts in library service and managing information technology is also very high such as patent search.*
OPPORTUNITY	**THREAT**
There is a huge opportunity of MLIS inside	*There is a little bit threat in MLIS because*
the geographical boundaries as well as	*IIM's, IIT's, XLRI & Nirma are already*
outside the geographical boundaries	*marketing their library services.*
through the use of Internet facility.	

Solution to stumbling block

Problems in marketing of services are more critical than marketing of products because of its characteristics such as intangibility, heterogeneity, perishability and inseparability. The problem of service in MLIS can be sort out by creating awareness about LIS in various institutions:

- MLIS will benefit the Institutes or organizations that do not have an adequate or moderate library resource for their Institutions.
- By providing quality based training to the external librarians and make them aware about the library operations and about the handling of sophisticated information system [6].

CONCLUSION

As librarians we should be actively marketing and promoting our library services in Institutions. The basic aim of marketing is to know and understand the user's needs and demands in order that the library is able to gratify in an effective way. Libraries will be utilizing the web to provide services to an increasingly classy and demanding computer user by providing admittance to the world's wide information that users and institutions need in a timely, expedient and evenhanded manner.

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An Evaluative Study of VIRTUA - The Integrated Library System with reference to the Acquisition of Documents in IGM Library, University of Hyderabad

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ABSTRACT

This paper discusses the process of collection development and maintenance in the ICT environment using the "Virtua" the integrated library system, which has additional features suitable for entering all types of documents as per International standards supporting global search and retrieval. Issues and problems working with Virtua Software with reference to Indira Gandhi Memorial Library, University of Hyderabad for acquiring various types of materials are discussed while highlighting the special features of the software. At the end few shortcomings of the software are mentioned for making necessary revisions to suit all libraries.

Keywords: Collection Development, University Libraries; Automated Acquisition System; MARC21; Integrated Library System

INTRODUCTION

Information as a commodity, in order to be useful, has to be put into action. Converting Information into usable form involves acquisition of learning material processing, utilization and transfer. Today collection development plays a prominent role and determines the library's impact on the outside world. Automation in libraries do not mean only to make their records available on machine readable form but the modern trend is

to avoid duplication by copying bibliographic details, sharing catalogue records based on certain standards. University libraries have advanced very much through modernization of in house operations including creation of bibliographic record of information material by way of using library software that enables web OPAC and global search and also to transfer or copy records.

Though the basic function of collection development is to acquire various information materials and also in house functions which involves creating bibliographic records, placing orders, receiving, invoicing, sending claims, making payments and maintaining related records, statistics etc., the structural framework has transformed as per changing policies of the library in terms of services. This transformation has been taking place from manual to online processing with the evolution of physical format of the information materials and also in the way of processing and maintaining records etc. Since the collection development is the most significant activity especially in larger university libraries, their acquisition system has been consistently improving its functional capabilities so as to suit to the current needs by automating various complex functions involved in it.

Thus this paper discusses the automation of acquisition system using Virtua the integrated library system in Indira Gandhi Memorial Library (IGM Library) to strengthen various functions involved in it to bring standardization of bibliographic records.

IGM Library, University of Hyderabad: a brief profile:

IGM Library, University of Hyderabad has a collection of more than 2.50 lakhs of books, subscribes around 600 journals. It spends nearly one Rs. 174 lakhs for books and Rs.375 on print and online journals/databases. Electronic security gate is installed to control the unauthorized exit of the books. This Library has the distinction of being the first university library in India to have fully automated its house keeping operations and converted all the catalog records in machine readable form and also building up of books database, serials database, charging and discharging of books in circulation.

During the year 1990, the integrated library application software (LIBSYS) was procured using XENIX as operating system for acquisition, cataloguing, circulation and serial control and OPAC (online public access catalogue) to provide quick search of books to the users. All the new book records were converted from dbase III+ into the LIBSYS and the retrospective data of 2, 35,000 volumes were converted by February 1995.

Further the library switched over to VIRTUA software for library automation and digital library during 2001 and replaced its card catalogue with web OPAC (Online Public Access Catalogue). The unique features of this library software are mentioned.

VIRTUA - INTEGRATED LIBRARY SYSTEM: UNIQUE FEATURES:

Virtua, the Integrated Library System which is getting acceptance internationally for library operations such as Acquisition, Circulation and Cataloging of Information material based on MARC 21 an international standard. Apart from MARC 21, Virtua also favors other international formats like CATMARC, SWETMARC and UNIMARC. Virtua cataloguing provides ISO 2709 MARC Communication Format for creating and maintaining Patron Records and Vendor Records. Library's resource development is based on its acquisition policies, which in turn are dependent on the funds.

MARC 21 Record Format: Apart from its utility in data access and exchange in the MARC 21 Format, the software provides the flexibility to add any new specification/s (fields) to the record by way of exploring (selecting from Virtua Software) and adding tag/s as per requirement. This is possible because the record format in Virtua is not fixed, but flexible.

Funds Management:

- Vouchers facilitating payments including valid invoices
- Vouchers for Advance payments to subscription agencies paid in lumpsum directly from the sanctioned grants.
- Defer the receipts position but proceed with invoicing
- Transfer of funds from one account to another and from one fiscal year to another
- The transfer of funds from one allocation to another especially when funds are exhausted in one accounts
- Status of the Funds as and when affected is depicted in ACCOUNT SETUP function.

Infostation: facilitates configuring as many types of reports as required in library acquisition system such as vendor lists, vendor's performance, voucher lists, account statements, titles on order, order status, new arrival lists, list of serials, cancelled serials, serials without holdings and serials received etc. The output text can be configured as per the requirement to suit both email and print transmission.

Updating the Database: merging multiple entries of same document into one in the existing database is one of the important features of Virtua apart from the routine updating functions like deletion and modification of existing records from the database.

Cataloguing: allows users to create bibliographic records for various types of information materials and achieve standardization relating to bibliographic records.

Web OPAC: enables users to search the library holdings from anywhere through web browser and view the details of borrowed books from login into their accounts.

UNIMARC: provision is made for entering records in all languages irrespective of the country

Digital Resources: It has facility to view the bibliographic details of electronic resources (CD ROM, Online etc.) and access them through web browser via intranet or internet.

VIRTUA – FUNCTIONAL CAPABILITIES (ACQUISITIONS)

Systems Security and Access Control: Virtua facilitates different controls to administrators, supervisors, operators and users through "Profiler" to achieve data security. The security system in Virtua differentiates the records access functions to create, modify, and delete depending upon the acquisition operations via user profiles as shown below.

- Global Settings (Specifically, the Currencies parameter)
- User Profiles
- Acquisitions Subsystem

Overrides: Virtua provides an important facility in the automated system to override when the budget is already specified and exceeds the sanctioned amount. This feature is very helpful.

Good Search and Retrieval System: Good search and retrieval is necessary across all the modules of an automated library system. Apart from author, title, subject, keyword and other truncated searching, it enables good indexing with every word being indexed in the database. It helps in acquisition process for duplicate checking, creating and editing the bibliographic records.

Data Entry and Validation: Virtua provides automatic validation to control errors during the data entry process. Authority files get developed in this process.

Prepayments and Cancellations: This is also one of the important features of Virtua for acquisition of both books and serials. The prepayment reflects in its fund account and flag the "received" status of the book as and when it is received. Order cancellations and diverting the same to another vendor through 'copy order' is possible through affecting the same funds as the accounts/funds are attached to the line items and immediately it reflects on the posted fund.

Reminders and Infostation Reports Generation: Reminders can be automatically generated. Overdue items as per the due date are set as default in vendor records, which enables to send reminders both vendor-wise and order-wise texts can be formatted for reports. All other types of reports such as Budget and vendor wise reports such as amount spent, list of books ordered etc can be configured in Infostation for books, serials and other material.

Smooth Work Flows: Because of the common functions and workflows involved in Acquisition of Monographs and Serials, which often require, integration of the data flow between two divisions can be seen. This integration includes ordering, tracking, renewing and paying for serial orders in advance, multi volumes sets, standing orders and serial publications. It supports integrated work flow, where one can move from adding a purchase order to receiving, invoicing and paying without reentering any information or using multiple windows for these operations. Flexible subsystems accommodate a variety of workflows and hence managing complex acquisition processes involved in collection development programs of Universities is becoming easier.

EDIFACT (Electronic Data Interchange for Administration Commerce and Trade and External online sources): It supports to access external online sources such as OCLC, Library of Congress and other sources like Books in Print, CD-ROM databases to create bibliographic records by downloading their cataloguing records.

Tool Tip Currency Converter: Though most of the acquisition transactions are done in home (default) currency, quick and immediate translation of foreign currency values into home currency is displayed in orders, invoices and payments due to the provision of Tool Tip Currency Converter that exists in Virtua. To enable this Tool Tip Currency Converter, the exchange rates for each foreign currency are to be constantly updated in the Profiler.

Accounting Structure: It allows creating a variety of budget heads Recurring, Non-Recurring Grants and Project Grants. It takes care of releasing of funds based on period. Multiple accounts can be set up and

funds can be posted to enable to place orders under different fund accounts, setting such accounts to each line item. "Transfer of funds" from one account to another and from one year to another and also booking one order with more than one fund accounts are the important features in Account Set up. This Account Structure facilitates easy and simple accounting transactions in acquisitions.

Vendor Directory: It allows creating vendor's directory and vendor records with simple data of their postal addresses and E-mail addresses to help in easy dispatch of orders by post or through mail. Several parameters related to vendors like contact persons names and phone numbers, performance, orders, bills, payments, claims, etc can be added and retrieved as and when required.

a. Due date for executing the order, supply, claims is set at vendor level which can be modified. This helps for claiming the unsupplied items and sending reminders at regular intervals.

b. Provision for multiple addresses with regard to orders, payments, claims, default etc for serials processing.

c. Type of transmission of orders, claims whether emails or print or both etc can be configured in these records.

d. Several defaults can be configured related to each vendor with regard to orders, payment and claims.

e. The vendor's poor performance can be reflected by blocking them, so that they are now selected for ordering, thereby blacklisting them.

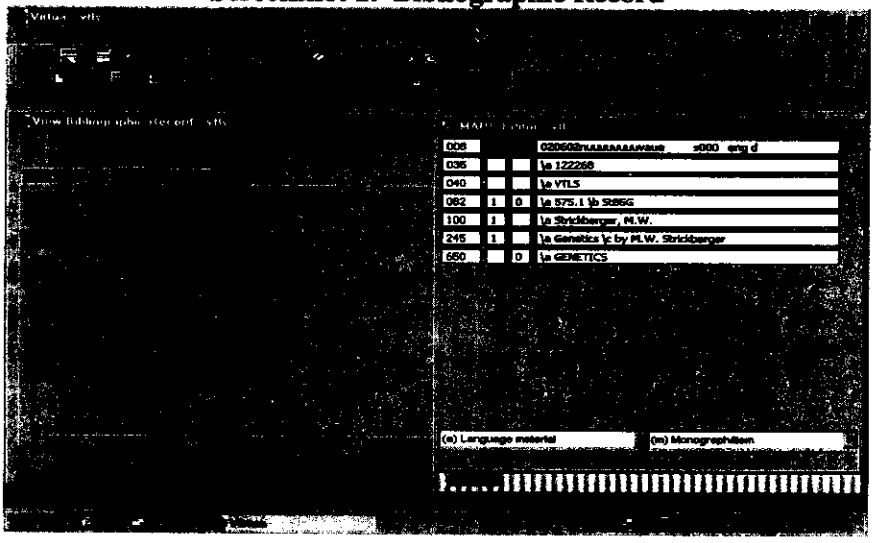
VIRTUA-BIBLIOGRAPHIC RECORDS:

Virtua supports all types of information materials such as Monographs, serial publications, serials, maps, music scores, computer files or electronic resources, audio, video records etc, and all types of acquisition processes such as purchase, subscriptions/renewals, donations, gratis, exchange etc. Work forms can be customized and records can be generated from Virtua default record structures - Booklab, Serilab, Complab, Maplab, Musiclab, and Mixedlab, sample for translations. Apart from common tags in all these work forms there are also specific tags, which distinguish each type of document. Each bibliographic record in Virtua contains the following fields –

- Control fields are fixed fields of the system 001 to 008
- Variable fields are also data fields 010 to 889.

The sample book work form (book lab) shows the details of sample Bibliographic Record, wherein the first three tags (001, 003, and 005) are fixed fields. The other fields are identified by tag numbers, which are essential for creating bibliographic data e.g. 100-Author, 245-title 260 Publisher 300 Physical descriptions 650 key words and so on.

Screenshot 1: Bibliographic Record



In Complab the following exclusive tags appear i.e. 256 Computer files; 516 Types of Computer Files or data note; 538 system details; 856 Electronic Location and Access.

In Serials Bibliographic Record the important tags are – 022 tag for ISSN (the same tag is used for ISBN in monographs); 310 tag for Current Publication-Frequency; 320 tag for former publication; 362 tag for dates of publication for sequential designation; 550 for issuing body note; 780 preceding entry; 785 succeeding entry; 856 Electronic resources. The Serials Bibliographic Record are associated with Holdings Records with them and linked by Bibliographic ID 001. The structure of holdings record begins with – 001 – 008; Fixed Field Data Elements; and 852 Location; 853 Captions and Patterns – Basic Bibliographic Unit; 754 Captions and Patterns – Supplementary Material; 855 Indexes; 863 Enumeration and Chronology-Basic Bibliographic Unit; 866-Textual Holdings.

IGM LIBRARY – ACQUISITION PROCESS USING VIRTUA

Virtua provides many options for handling records, forms, accounts and user permissions required for the acquisition processes as given below.

- Types of purchase orders
- Types of transmission of purchase orders
- Payment types
- Flexibility in ID numbers of Purchase Orders
- Formatting texts for purchase orders, claims, Acknowledgement letters, and payment vouchers
- Workflow flexibility such as proceed to Receipt /Invoices/Payment/Exit
- Adding required items such as special taxes, postal charges, sales taxes etc.
- Sending claim for overdue orders
- Maintenance of funds and transferring fund from one account to another
- Library can define statuses and they can be updated at item level
- When expenditure is exceeds in a fund account it can be met through transfer of funds from source to another
- User permissions can be regulated

Sample Acquisition Process:
The sample acquisition process using 'Virtua' is illustrated hereunder, with reference to Indira Gandhi Memorial Library (IGM Library), University of Hyderabad.

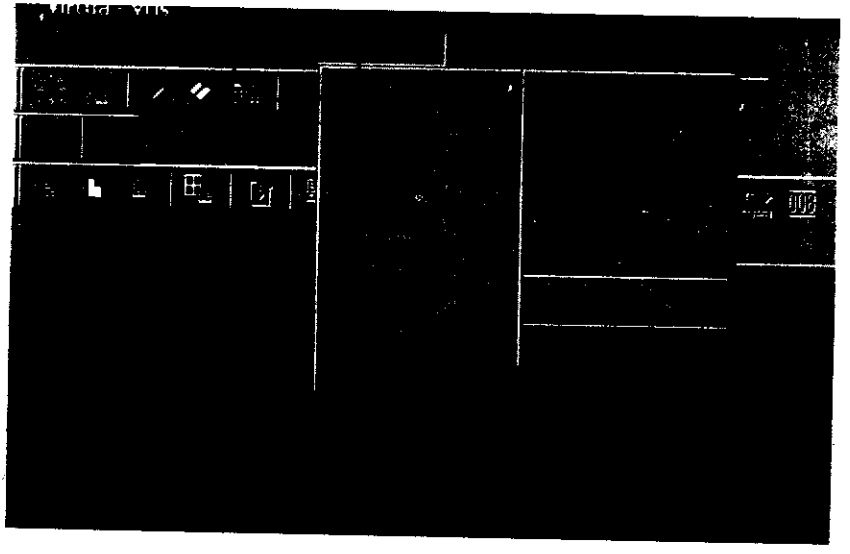
Configuring the Module:
In addition to the customization of work forms for Bibliographic Records and default setting of acquisition parameters in vendor records, certain other parameters have to be set in the profiler at client level. Adding fiscal year, Updating Conversion Rates, Fund Distribution Codes, receiving and cataloging options have to be done in **Virtua "Profiler"** which will be accessed by all clients. Validation of records, Tags for editing, setting default workforms can be done in the Cataloguing Options, Customizing by editing and formatting the print program files can be undertaken at Client (PC) level. Apart from creating Bibliographic Records, Vendor records and Accounts can be created for complete acquisition process.

The IGM Library has different types of funds recurring and Nonrecurring such as X Plan Grant for a period of 5 years, UGC special Assistance Program (SAP), University with potential for Excellence (UPE) Grant and various other grants under Departmental projects for books. Whereas

for serials the budget allocation is annual process comprising grants such as Maintenance Grant, UPE and NBHM. The grants are coded with prefixes of School, Departments and Type of grant to operate and tap the fund accounts to book orders. Vendors with addresses are created to place orders with vendors and publishers.

Duplicate Checking:
Through search function duplication checking is done using different search patterns such as author, title subject etc.

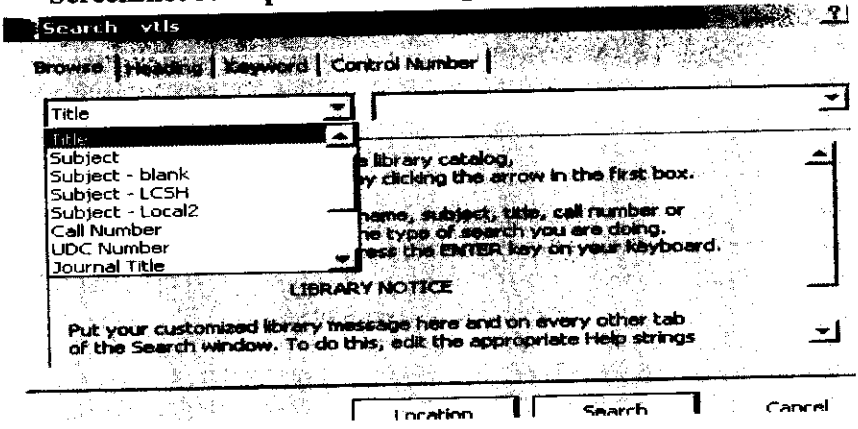
Screenshot 2: Acquisitions



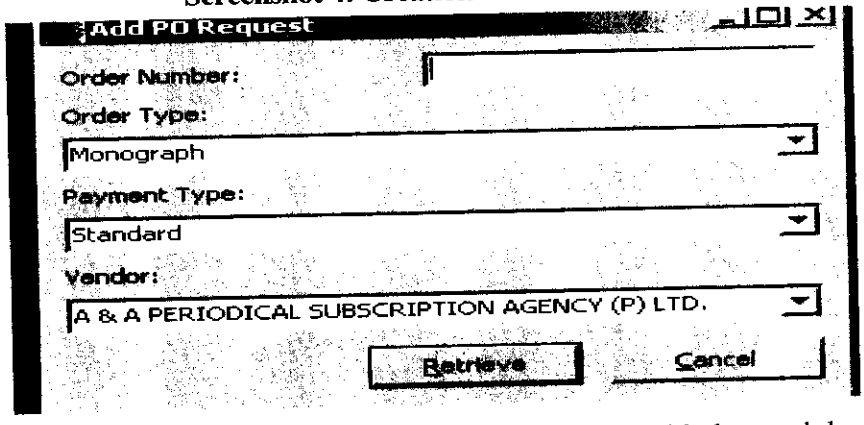
Placing Orders:
After duplicate checking new bibliographic records for non existing items are created through **File option** selecting create record sub function which allows saving different workforms.

Subsequently the same work forms can be used to enter new records with the click of the mouse. Once bibliographic record is created order can be placed through **"ADD ORDER"** function. When the acquisition order is clicked the Add order window opens where the order ID is supplied or the system can provide one. The following window appears for entering the order ID and choosing the vendor for placing orders.

Screenshot 3: Duplicate Checking through Search Function

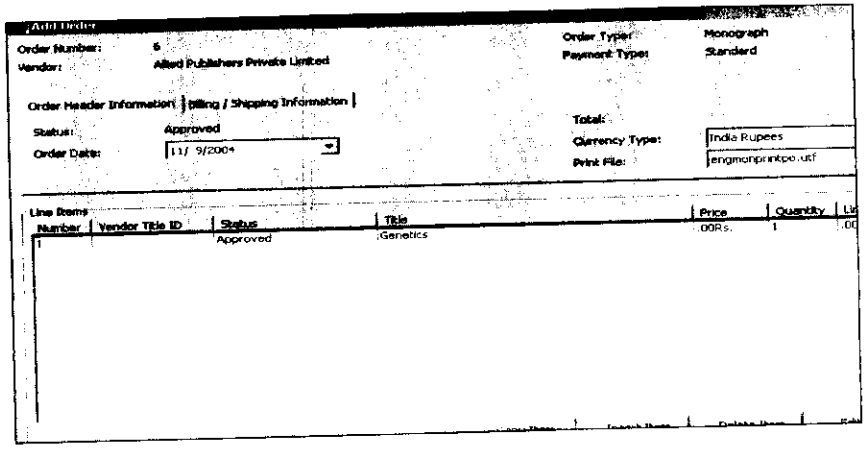


Screenshot 4: Creation of Order Form



When the order form is retrieved, we can insert titles with drag and drop function. This allows using multiple window operations.

Screenshot 5: Order Form

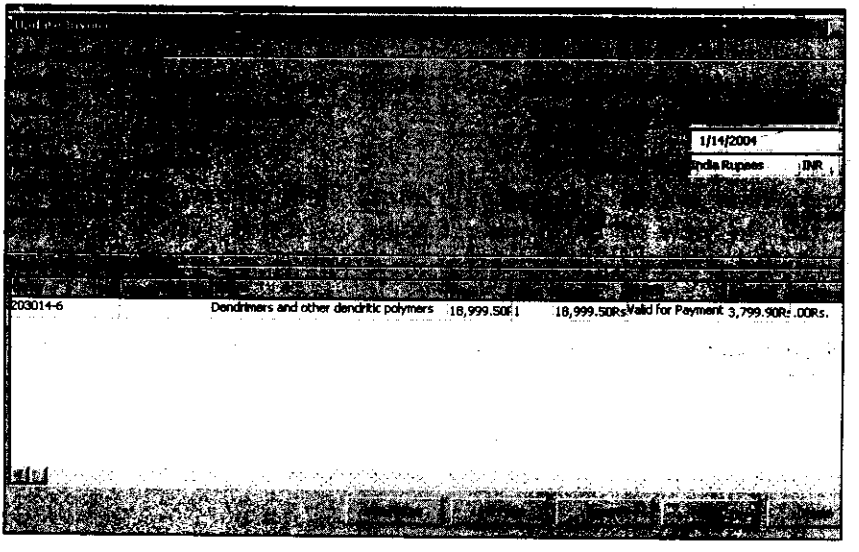


The titles are added to the order form and titles are double clicked to book under respective fund account where the funds are linked to the order is processed and sent to the vendor through **"Send Order"** function. Due date for orders is fixed at vendor level which helps to process reminders. Orders can be sent through E-Mail or through print orders.

Editing Script for Print Files: These files format the report out put to maintain the manual files for audit purpose during acquisition operations such as purchase orders, cancel orders, claims and acknowledgement letters for the books received as gift vouchers etc.

Invoicing: The second phase of acquisitions deals with receipts and invoicing, which is done in a sequential manner tapping the receipts function and updating it through the order ID without any redundancy. The order record is retrieved and receipts are updated followed by invoicing where provision is made for posting discounts, postal charges or all types of miscellaneous charges, which is a unique and special feature of this software.

Screenshot 6: Receiving and Invoicing



After invoicing there is a provision to proceed to payments just by pressing the enter key. The Account structure and fund position is immediately effected to show balance once the invoice is done. This feature enables us to maintain updated accounts and expenditure analysis.

ACQUISITION PROCESS OF SERIALS IN VIRTUA

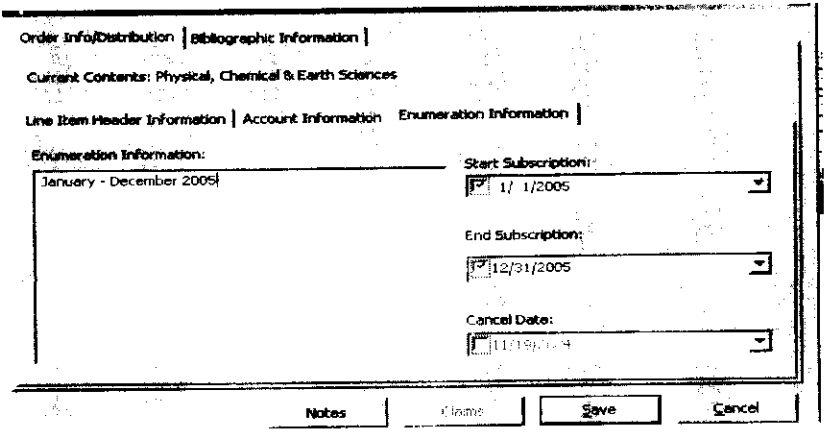
Acquisition process of serials varies from monographs and other kinds of documents including serial publications such as advances, proceedings and annuals etc. since each serial is unique among other titles of same publisher or different publishers.

- Serial is a continued publication at specific intervals. Thus a single record carries holdings of multiple years.
- Subscription of serials needs renewals as there will be continuity in publishing over the years.
- The change of title; merging of a serial in another one; split of a serial into multiple sections; ceasing of publication etc.
- Serial features are ever changing such as - physical format, publication, periodicity, distributing agency.
- Fluctuating prices, mailing charges, conversion rates, varying subscription periods, renewals etc.
- Pre-payments (advance payments) and receiving issues at different intervals
- Registering the serial issues (Regular, Unpredicted, Special, Supplements and Indexes) and transmitting Claims.
- Bindery Operations, combining the journal issues for binding and printing the list.
- Modifying the status into "Bound" and "Barcoding" the bound volumes/items.

Supporting Features:

Acquisition process is common for all the kinds of documents including serials. In view of the distinct features of serials, Virtua also made additional provisions in serial records as well as in the process of their acquisitions.

Screenshot 6: Serial Order with Enumeration (Subscription Period



- MARC Format supports the serial records with distinguished tags related to it.
- Serial records are in two forms: bibliographic record and holding record.
- Orders Selecting Serial type.
- Vouchers in favor of prepayments or advance payment against the Pro-Forma invoice and Bank guarantee (with relating to invoice function).
- Invoicing and making payments without receiving the items.
- Entering subscription periods for each serial title.
- Automatic creation of holdings records.
- Built in mechanism for making claims.

PROBLEMS ENCOUNTERED:

In spite of its special features the software has few shortcomings such as:

- Data entry windows are not formatted. Records do not carry blank tags. Updating the record with additional fields is possible only by adding tags to the record and data has to be added to the record separately.
- Records, parameters, configuration, posting/editing the data, data output are distributed to Virtua Profiler and Infostation. This inconsistency creates confusion.
- Acquisition of all the material is similar i.e. Orders, Receipts, Invoices, Vouchers, Accounts etc. Virtua ignores approvals, renewals at item level that are essential functions in case of serials or serial publications.
- Acquisition is a sequential process and has to be handled as a single operation for e.g. orders are processed for any material in a single sequence. The ordering process of other material is not distinguished in Virtua though it requires distinction in handling. Conversion rates as per GOC and RBI cannot be distinguished which is essential for serial acquisition operations. Some parameters like Fiscal year, Fund codes, Distribution codes which requires differentiation between serials and other kinds of documents, are not provided.
- Discount which is an essential parameter during order process is ignored at purchase order level but included only at the invoice level.

CONCLUSION

Collection development and maintenance as per MARC standards have been preferred in European countries to develop the format, to refine the processes and to achieve the economy of time. The integrated processes related to various kinds of library documents such as – acquisition, cataloguing, circulation, searching are closely linked in Virtua and also meets the latest needs for collection building and maintaining activities of the University libraries.

Virtua Software is internationally accepted and in India. Though nearly 30 libraries in India are using it, its price is not within the reach of many libraries. The updates of the software always take care of technological adaptations rather fulfilling the requirements of the customer libraries. The most of its features need to be customized to suit the Indian working conditions and processes and also support various regional languages. Thus the software also needs to be updated in the light of problems encountered by Indian libraries due to their manual processes or to overcome the drawbacks of primitive kinds of software.

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An Implementation of Open Source Software's: A case study

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ABSTRACT

Indian Institute of Technology Bombay (IITB) is a world class institution of higher learning and research in engineering, science and technology. The central library is one of the largest libraries in engineering and technology. The central library understands the concept of open source software (OSS) and were implemented the **Joomla** Content Management Software (CMS) to design and developed the library website http://www.library.iitb.ac.in and Greenstone Digital Library (**GSDL**) software to provide the access the bibliographic details with abstract to theses and dissertations since 1965 http://www.library.iitb.ac.in/~mnj/gsdl/cgi-bin/library and with the help of **DSpace,** setup an institutional repository http://dspace.library.iitb.ac.in/jspui/ for IITB publications. The **Koha** integrated library management software also used for School of management departmental library and the **Moodle** e-learning software used by IITB http://moodle.iitb.ac.in to develop the e-learning concept.

INTRODUCTION

Central Library - a proud partner in the institute's march towards its vision plays a pivotal role in generation, assimilation, and dissemination of knowledge. It has an excellent collection of over 4, 10,000 volumes comprising of text books, reference books, standards, patents, reprints, pamphlets, bound volumes of journals, technical reports, theses, dissertations and multimedia materials etc. It has been enriched with online access 24X7X365 on institute-wide network for more than 15,000 full text e-journals, bibliographic e-databases and standards. The in-house developed online submission of Electronic theses and dissertations (ETD) over 6000 full text of soft copies of ETD are available on Intranet and also core member of INDEST consortia.

The IITB management supports the concept of open source software (OSS) and more than 80% faculty, staff and students are using open

source operating systems as well as other applications and databases e.g. Linux various flavors and applications software such as open office etc.

OPEN SOUREC SOFTWARE

Open source is a development method for software that harnesses the power of distributed peer review and transparency of process. The promise of open source is better quality, higher reliability, more flexibility and support open standards. OSS is invented in order to provide software to users with more rights than proprietary (or commercial) software does that everyone is allowed to use, copy, or distribute, unmodified or with modifications, for free or for money, but always together with the source code.

There are so many open source software such as integrated library management, digital library, content management, databases and e-learning etc., under the various free and open source foundations, for which the source code is freely and publicly available, though the specific licensing agreements vary as to what one is allowed to do with that code.

LIBRARY WEBSITE OR PORTAL

We are in the information age and in this age, in order to be efficient, it is vital for us to store and retrieve information in the most convenient way. Hosting a website is one of the ways in which information can be organized.

Library web site or portal is become a single window providing integrated interface to locate any item regardless of format, language, location and at any time. The web site besides providing access to library OPAC and other in-house databases and provide links to online union catalogues, full-text sources (e-journals, e-books) and other relevant web sites.

A basic website can be developed using HTML (Hyper Text Markup Language). It can be made feature-rich and powerful by using the server side scripting languages such as PHP (Hypertext pre-processor), ASP (Active Server Pages) or JSP (Java Server Pages). While developing a website one has to have knowledge about web servers and web browsers, programming languages and CSS etc.

There are tools available to help to create using WYSIWYG (What-You-See-Is-What-You-Get) editors such as Adobe Dream weaver, Flash, Front Pages. These are useful to rapidly develop web pages, although they required the programmer has knowledge of HTML and other web-programming languages.

But with the help of Content Management Software (CMS) is feasible in terms of functionality (RSS feed, Blogs, Discussion forum, Wiki, News flash, Site search and Polls etc) cost and maintenance i.e. to add, change and delete content the novice users (who have no web-programming skills) can build the dynamic web site.

USE OF JOOMLA CMS

There are so many CMS software's are available such as Joomla, Drupal, Plone, PHP Nuke, Mambo, PHP-Fusion, OpenCMS, and Open ACS etc. it is very difficult task to choose right CMS because it's used various programming language and technology such as PHP, ASP, PERL, Python and Java. Databases supporting are MySql, PgSql and Oracle with Windows or Linux.

We have selected Joomla for central library web portal http://www.library.iitb.ac.in because it was regarded as one of the most user friendly tools and has won several awards. It's easy for installations and design and layouts are configured with extensible hypertext markup language (XHTML) and cascading style sheet (CSS). There are Hundreds of free templates, which are able to edited and configured to user's own look and feel and easy customization.

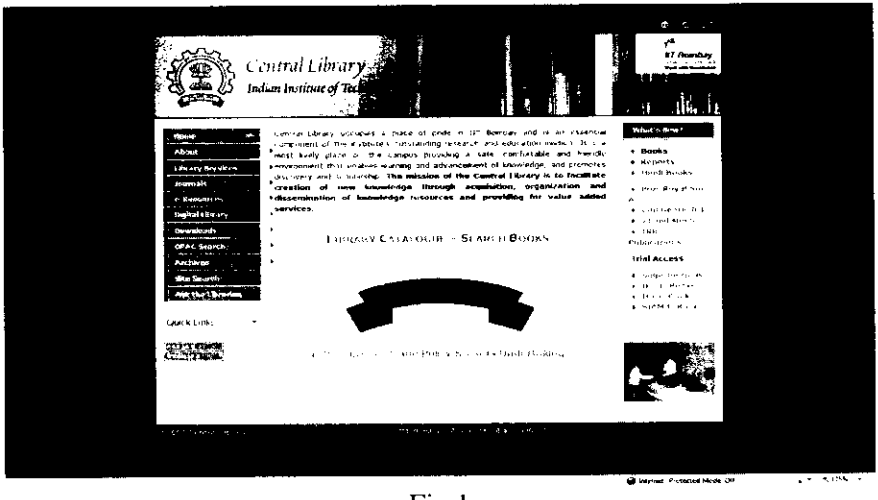


Fig 1
http://www.library.iitb.ac.in

BASIC CHARACTERISTIC OF JOOMLA:

Web content management systems have the following basic characteristics:

- ***Strict separation of content from design***: CMS apply the key principle of separating content from design. Page designs are stored in templates while the content is stored in a central repository.

- ***Component management***: Another basic characteristic of CMS is the existence of a component database (also known as content component database) where the content is stored.

- ***Workflow management***: The third major feature of CMS is workflow management. CMS typically allow the definition and control of workflow.

FUNCTIONALITY AND FUNDAMENTAL PRINCIPLES

- ***Content creation***: Content creation, also known as (content) authoring and content contribution, refers to the activities by which content is generated and entered manually by authors (content creators) into the content management system. CMS typically provide a Web-based, easy-to-use authoring environment, which enables authors to enter content conveniently by using a web browser and other integrated tools such as WYSIWYG editors.

- ***Content management:*** After the content is created, it is stored in a central repository (e.g. XML files or a component database) along with supplementary information (metadata). This repository constitutes the core of a content management system and enables content manipulation and content management.

- ***Content publishing:*** Information stored in the repository is distributed or delivery to users this stage is called publishing.

- ***Content presentation***: The functional area of presentation is concerned with the standardized appearance of a website. The published pages must meet certain standards in order to be of value to the users.

BASIC FEATURES OF CENTRAL LIBRAY PORTAL

The Web portal comprises of 168 contents pages; 360 MB disc space, over **7500** content links to important e-resources and direct links to e-journals subscribed by the library & trough INDEST consortium. The library portal enables the following modules.

- News Flash
- Quick links

- News Scroll
- Random Image
- RSS
- Contact
- Polls
- Search etc.

The library portal has nine main components of contents and it provides factual information:

(1) About- The staff (Our Team) Collection Organization, FAQs and Library holidays & hours.
(2) Library Services- Book Bank, Circulation, Inter-Library Loan, Membership, Reference Service, Photocopying, Users Awareness
(3) Journals - Current Journals, Library Holdings, Union Catalogue of holding
(4) E-resources: IT Infrastructure, e- Databases, e-Journals (A-Z), e-Journals (Publisher Wise), Multimedia Library, WI-FI network and e-resources uses guidelines etc.
(5) Digital library -Institutional Repository DSpace, ETD Submission (Intranet), ETD Search, INDEST etc.
(6) Download- Membership Form, Book Suggestion Form, Know Your Library
(7) Search - Search Book Search (OPAC), Advanced Book Search, User Details, Book Claim.
(8) Archives- Annual report, List of additions, Workshop report and written-off books
(9) Contact – Ask the Librarian
(10) What's new – New additions of books, reports pamphlets,

DIGITAL LIBRARY – ELECTRONIC THESES AND DISSERTATIONS (ETD):

The ETD digital library project was initiated at central library, IIT Bombay in 1999-2000 that runs parallel to its printed submission of theses and dissertations. We have in-house developed software for e-submission with the help of Computer Science department.

After the final defense of students, it is mandatory to submit full text ETD in addition to its printed copy. Consequently, Web server has been set up and maintained at central library at site http://etd.library.iitb.ac.in and it is available only on INTRANET. It has bibliographic records as well as full text of theses and dissertations for masters and doctorates from 2000 onwards is available on Intranet but we were keen to open the abstract with bibliographic details of entire collection of ETD to public.

The Central library digitized abstracts of Ph. D. theses prior to 2000 submitted to the institute and the theses submitted electronically after 1999 have been merged to form the complete database of electronic thesis and dissertations. The database has been housed in ETD server as well as Library web server URL http://www.library.iitb.ac.in/~mnj/gsdl/cgi-bin/library using Green Stone Digital Library Software (GSDL). The metadata elements such as Title, Creator, Subject, Contributor(s), Degree, Department, Language, Degree, Grantor, Date, Format, Identifier, Abstract and Rights etc. have been selected for display format using **Dublin Core standards**.

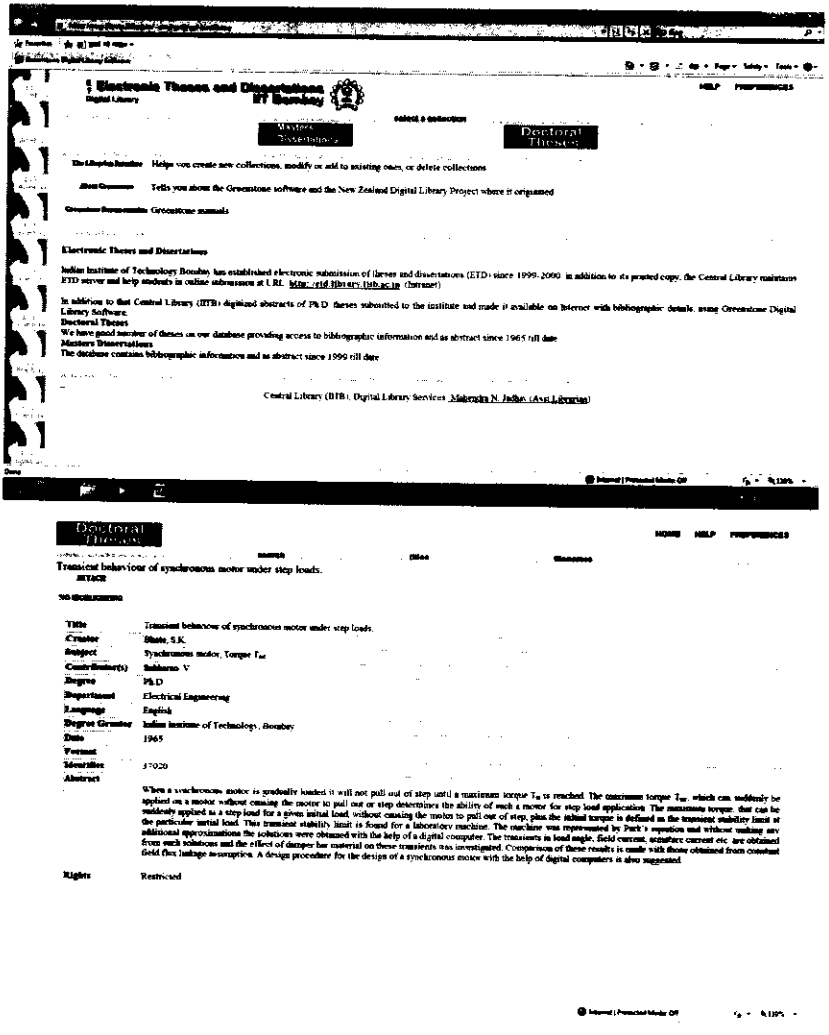


Fig. 2
http://www.library.iitb.ac.in/~mnj/gsdl/cgi-bin/library

INSTITUTIONAL REPOSITROY OF IITB

Indian Institute of Technology Bombay is an academic and research Institution where 1300+ researchers including 470+ faculties & Project Scientist/Engineers are involved in active research in the areas of science, technology and engineering. It produces 800+ research publications in peer review journals and thousands of paper published in conference proceedings.

IR implies to an online focus for collecting and preserving the intellectual outputs of an institution. It was decided to cover journal articles; conference proceedings articles, technical reports, thesis, dissertations, books, chapters in the book, patent etc. represent the intellectual output of an academic institution.

The institute approved the project and provides the financial as well as human resources. The Technical Committee selects DSpace as an Open-Source Software which were developed by MIT and HP. It was based on its unique features using standard parameters, community-based architecture, default browsing and search options and above all its customizable interface permitting its adoption as per the varying requirements of the host environment. It was observed that within span of short time it was cross over 450 installations across the World.

Initially we installed and configured DSpace version (1.4.2) on Linux (Fedora 5) platform, now upgraded to latest version. 1.5.2 with high end server and configured with XMLUI interface also.

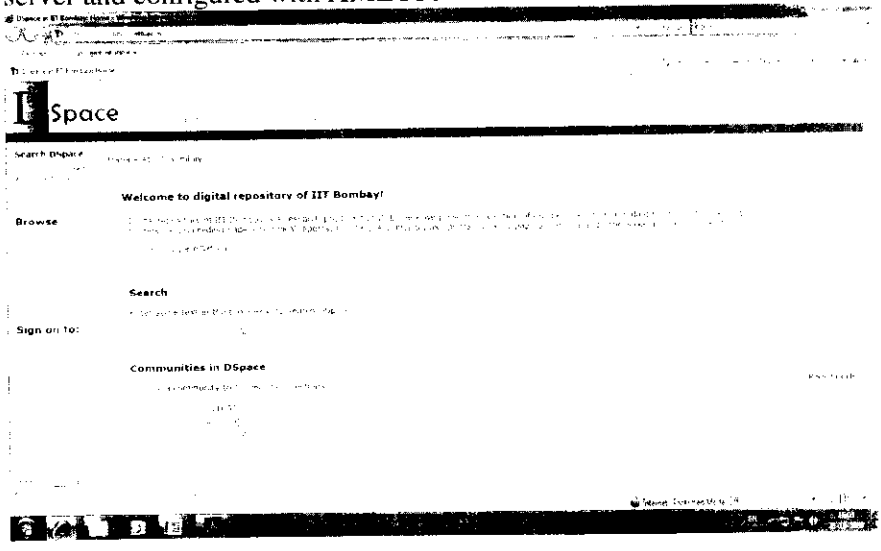


Fig. 3
http://dspace.library.iitb.ac.in/jspui

KOHA INTEGRATED LIBRARY MANAGEMENT SOFTWARE

Indian Institute of Technology Bombay (IITB) established its management school in the year 1995 with the objective of transforming professionals with technological background to "Renaissance Leaders" of tomorrow. After that it named as Shailesh J. Mehta School of management (SJMSOM) with its commitment to learning provides the students with a fully equipped library consisting of more than 7000 books, journals, Audio Visual Material (CDs and Audio cassettes), databases, Thesis & Dissertation and MDP reports.

The SJMSOM library desperately needed the library management software to provide the service to its users and for housekeeping operations such as Acquisition, circulation and OPAC etc. There are so many open source library software are available such as PhpMyBibli, Alexandria, Evergreen, Koha, NewGenLib and PMB.

The committee decided to use KOHA open source software for library management after careful study of the architecture, features like Simple, clear interface for librarians and members, Circulation and borrower management and Cataloging module with integrated Z39.50 client of the software and support of the open movement community developer. The KOHA 2.2.7 version was installed and it's customized as per our requirement.

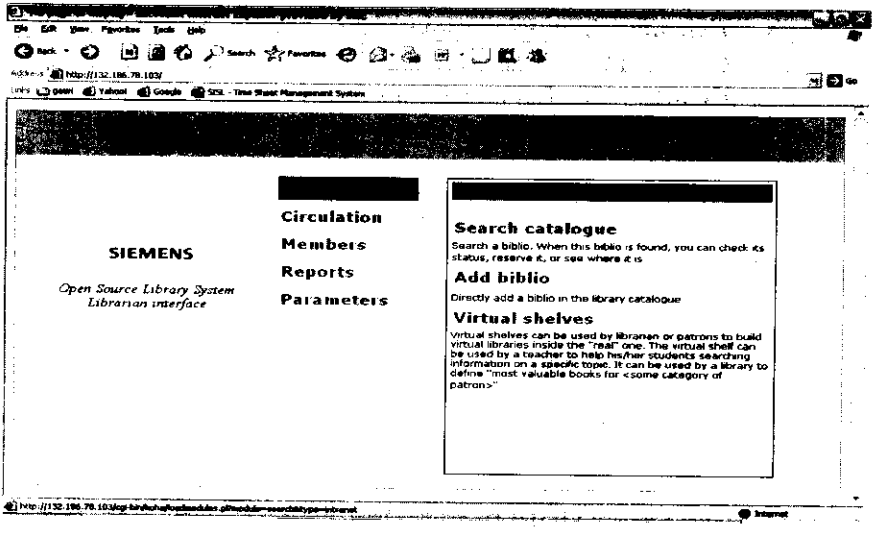


Fig. 4 Koha at SJMSOM library

MOODLE @ IIT BOMBAY

Moodle: Modular Object-Oriented Dynamic Learning Environment is a free and open-source e-learning software platform, also known as a Course Management System, Learning Management System, or Virtual Learning Environment.

IIT Bombay Center for Distance Engineering Education Programme (CDEEP) transmits live courses through EDUSAT, ISRO's satellite dedicated to the education sector.

These courses are transmitted unencrypted and anyone who has access to student interactive terminals (SITs) of the Indian Space Research Organisation (ISRO) can freely tune in to these lectures and also interact live with IIT Bombay faculty. These are institutions which enter into a MoU with IIT Bombay to receive our courses.

The courses are intended for working professionals as well as engineering college faculty and students. There are 4 modes of participation, each with a different fee and certification structure.

- ***Live Classroom***: This is the basic free service available for all institutes that have installed EDUSAT's Student Interactive Terminal (SIT).

- ***Extended Live Classroom***: This package extends the Live Classroom and is available only for CDEEP's Remote Centres. The Remote Centre will get a certificate that it participated in the Extended Live Classroom.

- ***Offline Classroom***: Students make use of recorded courses made available through CDEEP's Video on Demand (VOD) facility.

- ***Credit***: In this mode, individual participants register for courses at a Remote Centre. Participants attend live IIT Bombay classes transmitted to the Remote Centre. Participants will be evaluated by the Remote Centre as per their norms. This evaluation may include quizzes, assignments and exams conducted during the course of the programme by the Remote Centre.
  At the end of the semester, successful participants will receive a grade certificate from the Remote Centre

Moodle is designed to help educators create online courses with opportunities for rich interaction. Its open source license and modular design mean that people can develop additional functionality.

FEATURES OF MOODLE

- Activities (including word and math games)
- Resource types
- Question types
- Data field types (for the database activity)
- Graphical themes
- Authentication methods using LDAP, Shibboleth
- Enrollment methods
- Content Filters

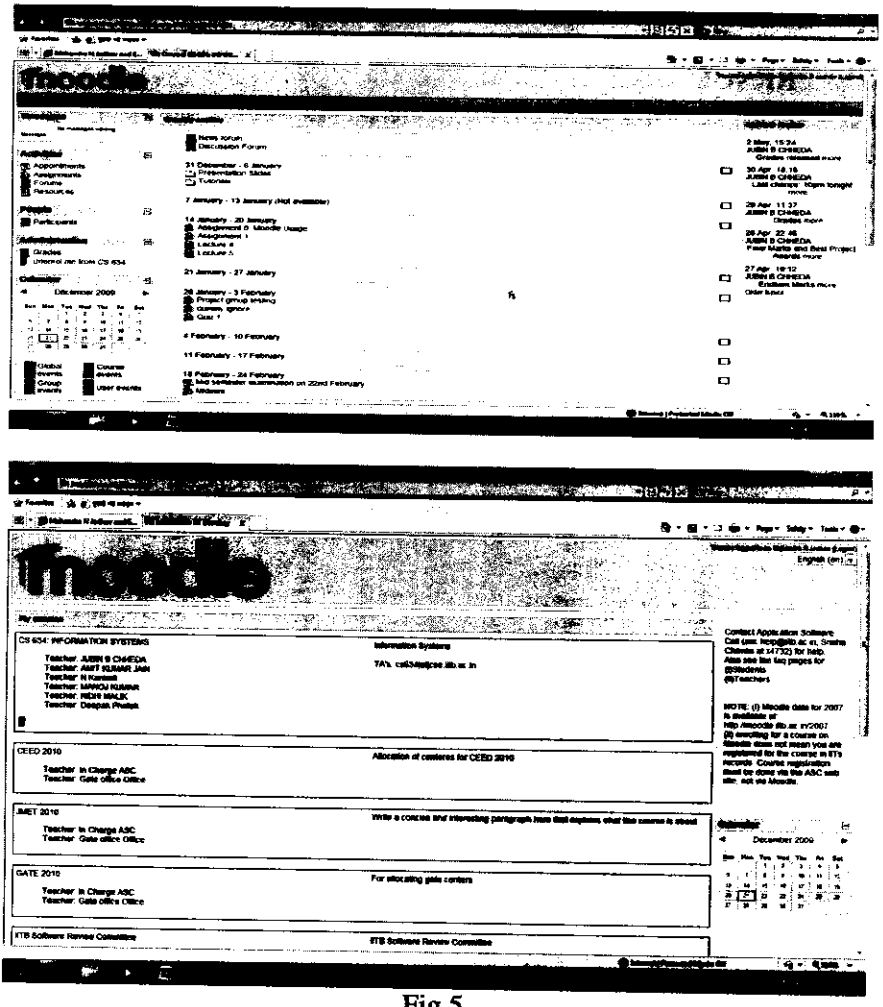


Fig 5

http://moodle.iitb.ac.in

Moodle is used for evaluation of student's assignments, presentations and tutorial those who have register for credit. Teacher will evaluate

online and give the credit and the certificate will be distribute in the Remote study centres.

CONCLUSION

Open Source Movement and Free Software Movement given lot's of thing to society. The OSS has natural strengths which benefit individual users. Above and beyond this, the widespread use of OSS holds advantages open standards and open data. The implementation of above software is not possible without support of management and motivations. Finally, I could say that, successful OSS/FS projects, technical skill, management skill, leadership skill are required.

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[5] http://www.dspace.org
[6] http://www.library.iitb.ac.in
[7] http://dpace.library.iitb.ac.in/jspui

Technical Session VII
Sub Themes
Open Source and Quality Assurance

WITH BEST WISHES

Central
News
Agency

Central News Agency Private Limited
23/90 Connaught Circus
Post Box No 374
New Delhi 110001 - India



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Empowering Knowledge Society through Open Access: Some Scholarly Open Access Resources and Services

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INTRODUCTION

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 invests significantly in harnessing the available skills, technology and learning towards development. The traditional notion of ***'Knowledge for its own sake'*** has today given place to the modern idea ***'Knowledge is for Development'***. The concept of "Vasudeva Kutumbakam" which saw the whole humanity as a family, was born here, long before the terms, industrialization, knowledge society, liberalization, globalization came into being. Empowerment is a powerful and important dimension in the process of growth, particularly in a knowledge society. It seeks to enrich the people with the infrastructure, relevant skills, and attitudes to tap the enormous opportunities that emerge in society.

In the ancient time the libraries are the store house of information and knowledge resources, each and every document is tagged with chain (chained libraries), later locked with almirahs and opened rarely. Now all most all the libraries (except few school & college libraries) are following open access system i.e., any user can feel free to enter all nook and corner of the library and browse his/her required information. But access to world's scholarly communication is difficult is because the serials prices increasing enormously. With this trend many libraries stopping to subscribe high quality scholarly journals. Open access movement and open access initiatives

worldwide tries to remove some of the barriers or obstacles in access to scholarly information for empowering knowledge society.

OPEN ACCESS: A BRIEF HISTORICAL PERSPECTIVE:

In the history and landmark event with respect Open Access is ***"Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities"*** emerged in 2003 conference held at Berlin hosted by Max Planck Society. The Budapest Open Access Initiative arises from a small but lively meeting convened in Budapest by the Open Society Institute (OSI) on December 1-2, 2001. The purpose of the meeting was to accelerate progress in the international effort to make research articles in all academic fields freely available on the internet. The participants represented many points of view, many academic disciplines, and many nations, and had experience with many of the ongoing initiatives that make up the open access movement.

THE CONCEPT AND MEANING OF OPEN ACCESS:

Open access means permitting any users to read, download, copy, distribute, print , search, or link to the full texts of 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. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited. . . . (Budapest Open Access Initiative)

The BOAI statement suggests two strategies for achieving open access:

1. Self-archiving
2. Open Access Journals.

1. Self-Archiving

Any scholars, authors, creators develop their own archive using standard archival tools and to deposit their intellectual contents in open electronic archives, this type of a practice commonly called, self-archiving.

Self-archiving can be achieved in at least three ways:

- Putting articles on author Web sites – through individual website
- Depositing articles in disciplinary archives – e.g., E-Prints Archive
- Depositing articles in institutional archives and repositories – e.g., Bangalore University Institutional Repository, IISc E-Prints Repository etc.,

2. E-Prints

Self-archived articles may be preprints i.e., draft articles that have not been peer-reviewed or edited or postprints i.e., final, edited versions of peer-reviewed articles). The term used for both is "e-prints." Certain scientific disciplines, such as physics, have a long history of e-print distribution.

3. Disciplinary Archives

Disciplinary Archives which covers scholarly information with respect to a particular discipline either may be intra-disciplinary, interdisciplinary and multidisciplinary. In other words the subject and knowledge scattered within and out side the discipline. In the early 1990's, formal 'disciplinary archives' began to displace scholar-to-scholar distribution in some scientific disciplines. Disciplinary archives not only provides scholarly information(both pre-prints and post-prints articles) but also facilitate to search, browse and retrieves various products, services, institutions, organizations and associations which promotes the development such discipline. The most famous disciplinary archive is probably arXiv, which covers physics, mathematics, non-linear science, computer science, and quantitative biology. It was established in 1991. It is important to keep in mind that some disciplines rely more heavily on articles than others, and that some disciplines that rely heavily on articles do not have a strong tradition of using e-prints. Consequently, there can be significant disciplinary differences in receptiveness to open access.

4. Institutional Repositories

Institutional repositories (IR) are digital archives that captures, organize, preserve and disseminate the intellectual assets and heritage of a signal or group of institutions. Content is the king in the IR. An institutional repositories may contain the intellectual knowledge produced by the research scholars, faculty, students in the form of articles, theses, dissertations, sponsored research projects, lecture materials, technical materials, institutions news letters, handouts, leaflets, datasets, practical manuals, laboratory experiments etc., E-Prints and DSpace at IISc, NAL, RRI, ISI(DRTC) are notable examples of an institutional repository. Where disciplinary archives provide access to the worldwide literature of one or more fields, institutional archives and repositories focus on the literature produced by a single institution. The popular EPrints, DSpace, GSDL software are used for disciplinary archives and institutional repositories throughout the world.

5. Open Access Journals:

According to Steven Harnad "..making the refereed journal literature in all disciplines on-line and free for all, with no financial firewalls, is the optimal and inevitable solution for science and scholarship".

DOAJ define open access journals as journals that use a funding model that does not charge readers or their institutions for access. From the BOAI definition of "open access" we take the right of users to **"read, download, copy, distribute, print, search, or link to the full texts of these articles"** as mandatory for a journal to be included in the directory.

The researchers, scholars and scientists are contributes their ideas, theories, thoughts and experiments in the form of research articles and same contributing towards scholarly communication process. Now there are quite a good number of peer reviewed open access journals functioning around the world. Because journal articles should be disseminated as widely as possible, these new journals will no longer invoke copyright to restrict access to and use of the material they publish. Instead they will use copyright and other tools to ensure permanent open access to all the articles they publish. Because price is a barrier to access, these new journals will not charge subscription or access fees, and will turn to other methods for covering their expenses.

SOME SCHOLARLY OPEN ACCESS RESOURCES AND SERVICES

1. Directory of Open Access Journals (DOAJ)

The aims and scope of the Directory of Open Access Journals is to increase the visibility and ease of use of open access scientific and scholarly journals thereby promoting their increased usage and impact. The Directory aims to be comprehensive and cover all open access scientific and scholarly journals that use a quality control system to guarantee the content. In short a one stop shop for users to Open Access Journals. (http://www.doaj.org/)

2. Intute

With millions of resources available on the Internet, it can be difficult to find useful materials for individual requirements. Intute is a free online service that helps to find the best web resources for our studies and research. The subject specialists review and evaluate thousands of resources to help choose the key websites in all most all branches of subject. Intute is also help to develop Internet research skills through Virtual Training Suite tutorials, written by lecturers and librarians from universities across the UK. (http://www.intute.ac.uk/)

3. Open Access & Institutional Repositories with EPrints

EPrints is the most flexible platform for building high quality, high value repositories, recognized as the easiest and fastest way to set up repositories of research literature, scientific data, student theses, project reports, multimedia artifacts, teaching materials, scholarly collections, digitized records, exhibitions and performances.

Eprints are the digital texts of peer-reviewed research articles, before and after refereeing. Before refereeing and publication, the draft is called a "preprint." The refereed, accepted final draft is called a "postprint." (*Note that this need not be the publisher's proprietary PDF version!*) Eprints include both preprints and postprints (as well as any significant drafts in between, and any post publication updates). Researchers are encouraged to self-archive them all. The OAI tags keep track of all versions. All versions should contain links to the publisher's official version of record (http://www.eprints.org/).

An Eprint Archive is a collection of digital documents. OAI-compliant Eprint Archives share the same metadata, making their contents interoperable with one another. Their metadata can then be harvested into global "virtual" archives, such as OAIster, that are seamlessly navigable by any user (just as a commercial index or abstract database is navigable, but with full-text access).

4. Vascoda Portal

Vascoda is a free of charge internet portal for all those looking for scientific and scholarly information. Vascoda offers user-friendly access to reliable information and full texts from a wide range of different subject areas. Starting with one standard user interface, one can choose either a subject-specific or an interdisciplinary search. Using a modern search engine technology, allows a fast and high-structured search across multiple sources, like subject specific databases, bibliographic databases and directories of internet sources. Detailed Collection Level Descriptions leads to high quality, specialized subject-specific portals of vascoda partners. Vascoda and the integrated subject offerings are developed and maintained by academic libraries and nationally important information providers. vascoda has, therefore, access to resources which are not visible to internet search engines (http://www.vascoda.de/)

5. arXiv

arXiv is an e-print service in the fields of physics, mathematics, non-linear science, computer science, quantitative biology and statistics. The contents of arXiv conform to Cornell University academic standards. arXiv is owned, operated and funded by Cornell University, a private not-for-profit educational institution. arXiv is also partially funded by the National Science Foundation. At present open access to 5,72,135 e-prints in Physics, Mathematics, Computer Science, Quantitative Biology, Quantitative Finance and Statistics. (http://arxiv.org/)

6. JISC

JISC inspires UK colleges and universities in the innovative use of digital technologies, helping to maintain the UK's position as a global leader in education. JISC provides: (http://www.jisc.ac.uk/)

- A world-class network - JANET

- Access to electronic resources
- New environments for learning, teaching and research
- Guidance on institutional change
- Advisory and consultancy services
- Regional support - RSCs

7. WorldWideScience:

WorldWideScience is a global science gateway connecting to national and international scientific databases and portals. Much of the information accessed via this gateway is freely available and open domain. It provides only quality, authoritative science information from the most current research provided by participating nations. ***WorldWideScience*** accelerates scientific discovery and progress by providing one-stop searching of global science sources. The WorldWideScience Alliance, a multilateral partnership, consists of participating member countries and provides the governance structure for WorldWideScience. Any citizens and scientists in all nations... indeed anyone interest in science can make use of resources available on the portal. **Users** can get the most current findings in fields such as energy, medicine, agriculture, environment, and basic sciences. Currently, approximately 60 databases and portals from over 60 countries are searchable through WorldWideScience.org. The global science gateway initiative began with a Statement of Intent to partner between the United States and the United Kingdom. Since then, a multilateral partnership, the WorldWide Science Alliance, has been formed to provide a geographically diverse, long-term governance structure. The Alliance will promote and build upon the original vision of a global science gateway. Other nations are invited to participate. This portal is hosted by the U.S. Department of Energy Office of Scientific and Technical Information. (http://worldwidescience.org/)

8. Public Library of Science (PLoS):

The Public Library of Science (PLoS)is a nonprofit organization of scientists and physicians committed to making the world's scientific and medical literature a public resource. The major goal of the organization is to open the doors to the world's library of scientific knowledge by giving any scientist, physician, patient, or student - anywhere in the world - unlimited access to the latest scientific research. Its founding in October 2000 by biomedical scientists Harold E. Varmus, Patrick O. Brown, and Michael B. Eisen, PLoS's first action was to circulate an open letter encouraging scientific publishers to make the research literature available for distribution through free online public archives such as the US National Library of Medicine's PubMed Central. This letter, signed by nearly 34,000 scientists from 180 countries, prompted significant steps by many scientific publishers towards freer access to published research. (http://www.plos.org/)

9. OAIster

OAIster is a union catalog of millions of records representing open archive resources that was built by harvesting from open archive collections worldwide using the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH). Today, OAIster boasts more than 23 million records representing digital resources from more than 1,100 contributors. OAIster records are freely available through WorldCat.org. The records of the open archive digital resources available via OAIster lead to a wide range of Multidisciplinary resources such as Digitized (scanned) books and journal articles, Digital text, Audio files (wav, mp3), Video files (mp4, QuickTime), Photographic images (jpeg, tiff, gif) , Data sets (downloadable statistical information), Theses and research papers.(http://www.oclc.org/oaister/)

10. eScholarship

eScholarship provides a suite of open access, scholarly publishing services and research tools that enable departments, research units, publishing programs, and individual scholars associated with the University of California to have **direct control over the creation and dissemination of the full range of their scholarship.** eScholarship, one can publish the original scholarly works on a dynamic research platform available to scholars worldwide such as journals, books, working papers, conference proceedings, seminar/paper series. eScholarship also provides deposit and dissemination services for postprints, or previously published articles. (http://escholarship.org/)

11. HighWire Press

High Wire press is the largest archive of free full-text science on Earth! As of November 2009 HighWire assisting online publication of 1,958,465 free full-text articles and 6,142,815 total articles. There are 10 sites with free trial periods, and 46 completely free sites. 281 sites have free back issues, and 1187 sites have pay per view! (http://highwire.stanford.edu/lists/freeart.dtl).

12. J-STAGE

In order to support the information transmission function of user organizations, the "Japan Science and Technology Information Aggregator, Electronic" (J-STAGE), developed by Japan Science and Technology Agency (JST), set up the hardware and software necessary for electronic journal release within JST to provide services 24 hours a day, 7 days a week. The major objective of the J-STAGE is developing Japan's science and technology research at an international level, it is important to disseminate outstanding research and development results to the world instantaneously. (http://www.jstage.jst.go.jp/browse/).

13. TechXtra

TechXtra is a free service which can help you find articles, books, the best websites, the latest industry news, job announcements, technical reports, technical data, full text eprints, the latest research, thesis & dissertations, teaching and learning resources and more, in engineering, mathematics and computing (www.**techxtra**.ac.uk/).

14. Chemspy:

Chemspy prepared the extensive list of free Biotechnology & Pharmaceuticals magazines, white papers, download and podcasts to find the titles that best match with user's requirements; topics include chemicals, genetics, bioinformatics and genomics. Simply complete the application form and submit it. All are absolutely free to professionals who qualify. (http://www.chemspy.com/)

15. Internet for Librarians:

Internet for Librarians has been a popular information resource site for librarians since 1994. It is an information portal designed for librarians to locate internet resources related to LIS Profession. It provides links to over 4,000 resources. All the resources are recommended, selected and reviewed by librarians. (http://lii.org/)

16. Ingenta:

Ingenta offers an integrated free search service for scholarly communication. Searching Ingenta is free but article delivery service is charged. (www.ingenta.com/)

17. Internet Library for Librarians:

Internet Library for Librarians has been one of the most popular information resource sites for librarians. It is an information portal specifically designed for librarians to locate Internet resources related to LIS profession. This portal provides links to more than 3,500 resources. All the resources are recommended, selected, and reviewed by librarians. Each entry has a full description of the goals and /or scope of the resource, as well as the contact information if provided. Internet Library for Librarians is a handy and useful tool for both novices and experienced library staff. (http://www.itcompany.com/inforetriever/)

18. Australian Digital Thesis (ADT)

The aim of the ADT program is to establish a distributed database of digital versions of theses produced by the postgraduate research students at Australian universities. The theses will be available worldwide via the web. The ideal behind the program is to provide access to, and promote Australian research to the international community. The initial project was funded by an Australian Research Council (ARC) - Research Infrastructure Equipment and Facilities (RIEF) Scheme grant (1997/1998). (http://adt.caul.edu.au/)

19. AERADE Reports Archive:

AERADE is a quality portal to Aerospace and Deference Resources on the internet. The Aerade Reports Archive incorporates more than ten thousand, historically significant, digitised reports from the Aeronautical Research Council (ARC) - the principal agency in Great Britain with a major output of reports on matters aeronautical, which existed from 1909-1979, and published reports until 1980. (http://aerade.cranfield.ac.uk/reports.html).

20. ARROW

Australian Research Repositories Online to the World (ARROW) is project and their objective is to identify and test software to support best-practice institutional digital repositories at the ARROW Consortium member sites to manage e-prints, digital theses and electronic publishing. This has been developed and tests a national resource discovery service using metadata harvested from the institutional repositories by the National Library of Australia (http://www.arrow.edu.au/)

21. Citeseer

CiteSeer is a scientific literature digital library and search engine that focuses primarily on the literature in computer and information science. CiteSeer aims to improve the dissemination and feedback of the scientific literature and to provide improvements in functionality, usability, availability, cost, comprehensiveness, efficiency, and timeliness in the access of scientific and scholarly knowledge. The CiteSeer model was used to create a similar search engine, SmealSearch, for academic business documents. CiteSeer also provides mirrors at other sites. CiteSeer was the first digital library and search engine to provide automated citation indexing and citation linking using the method of autonomous citation indexing. (citeseer.ist.psu.edu/)

OPEN ACCESS/ARCHIVE IN INDIA:

The situation in India regarding Open Access/Archive has found its roots mainly in the elite institutions and organisations such as Indian Institute of Science (IISc), Indian Academy of Science, Indian National Science Academy, Indian Medlars, NISCAIR etc., and some R & D organizations also took initiatives to create digital repositories to access to intellectual output of the institute. But the initiatives from the Government of India in this direction not visible when compare to US, UK, Australia and European countries, even though the Indian has potential strong in the Information and Communication Technologies. It was worth to note that some the above mentioned organizations are understand the significance of open access to scholarly communication using open standard system (OSS) technologies.

1. Indian Academy of Science

One of the oldest and reputed learned scientific societies with its aims and objectives is to promote and progress of science. The academy has taken the lead in India in providing open access its publications. (www.ias.ac.in/)

2. INSA:

Indian National Science Academy (INSA): Another learned academy INSA proposed a project, Building Digital Resources: Creating Facilities at INSA for hosting Science and Technology journals online. INSA wants to promote open access initiatives in India by inviting to host repositories on the INSA server. (www.insa.ac.in/)

3. E-Prints IR Archive:

An Institutional Repository of intellectual output from the prestigious nationally important institute i.e., the Indian Institute of Science, Bangalore developed and maintaining e-Prints repository. This archive successfully maintained by the National Centre for Science Information (NCSI) and support self-archiving various file formats. (eprints.iisc.ernet.in/)

4. Bioline International:

Bioline International is a not-for-profit scholarly publishing cooperative committed to providing open access to quality research journals published in developing countries. BI's goal of reducing the South to North knowledge gap is crucial to a global understanding of health (tropical medicine, infectious diseases, epidemiology, emerging new diseases), biodiversity, the environment, conservation and international development. By providing a platform for the distribution of peer-reviewed journals (currently from Bangladesh, Brazil, Chile, China, Colombia, Egypt, Ghana, India, Iran, Kenya, Malaysia, Nigeria, Tanzania, Turkey, Uganda and Venezuela), BI helps to reduce the global knowledge divide by making bioscience information generated in these countries available to the international research community world-wide (http://www.bioline.org.br/)

5. Indian Medlars Centre

IndMED - database covering prominent peer reviewed Indian biomedical journals. Database designed to provide medical professionals/researchers/students and the medical library professional quick and easy access to Indian literature. (http://indmed.nic.in/)

MedInd is one point resource of peer reviewed Indian biomedical literature covering full text of IndMED journals. It has been designed to provide quick and easy access through searching or browsing. (http://medind.nic.in/)

6. Open J-Gate

Open J-Gate is an electronic gateway to global journal literature in open access domain. Launched in 2006, Open J-Gate is the contribution of Informatics (India) Ltd to promote OAI. Open J-Gate provides seamless access to millions of journal articles available online. Open J-Gate is also a database of journal literature, indexed from 6109 out this 3490 journals are peer reviewed open access journals, with links to full text at Publisher sites. (http://www.openjgate.com/Search/QuickSearch.aspx)

7. NISCAIR Journals:

National Institute of Science Communication and Information Resources (NAISCIR) is publishing arm of India's Council of Scientific and Industrial Research (CSIR) journals (17 journals - one of them in Hindi) and two abstracting journals. NISCAIR adopted the open access philosophy to provide global access India's scholarly publications. (http://www.niscair.res.in/)

8. DESIDOC Journal of Library & Information Technology:

This journal provides immediate open access to its content on the principle that making research freely available to the public supports a greater global exchange of knowledge. (http://publications.drdo.gov.in/ojs/index.php/djlit/index)

CONCLUSION:

Open Access Archiving (OAA) is a mechanism for making scientific output (papers or articles) accessible as a parallel supplement to the usual scientific publication process. It is accomplished by depositing a copy of the published work in an Open Access Archive (for example, in an institutional or subject-based repository). The terms "archive" and "repository" are taken as equivalent. *Archive* has historical precedence in this context – for example, *the Open Archives Initiative* and the 'self-archiving initiative'; *repository* is a more recent term intended to avoid irrelevant connotations of bulk storage and preservation for documents whose primary utility is "archival" rather than the immediate access and usage that is the primary rationale for Open Access.

In this article the authors made an attempt to identify, locate more useful, authenticated and evaluated open sources resources. But lot more open sources are also available including e-books, organizations and individual institute repositories are not covered in this article due to limitation of number pages and restricted words. It may discuss further during the presentation of this article.

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Library Automation with Open Source Software NewGenLib: A case study of Knowledge Centre, BIMTECH

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ABSTRACT

Open source library packages are increasingly gaining popularity nowadays. Many open source software applications now available for library automation. The purpose of the present case study is to describe the selection process and criteria that led to the implementation of the **NewGenLib,** an Open Source Integrated Library Management System at the Knowledge Centre of Birla Institute of Management Technology (BIMTECH), Greater Noida. The present paper discusses the salient features, technologies used, functional modules, and installation of NewGenLib.

INTRODUCTION

Birla Institute of Management Technology (BIMTECH), Greater Noida was established in the year 1988 under the aegis of the Birla Academy of Art and Culture, and supported by Birla group of companies. The mission of the institute is to impart management education to prepare

business leaders and entrepreneurs to stand up to global competition. It has progressed from a moderate start to the 7th rank among top 50 private business schools of the country under Open-Cfore Survey. The institute awards PGDM (Post Graduate Diploma in Management), PGDM-IB (International Business), PGDM-IBM (Insurance Business Management), PGDM-RM (Retailing and Merchandising Management), PGDM-SD (Sustainable Development), PGDM (Part Time) and doctoral degrees in management stream.

The institute library, which is known as Knowledge Centre, is an essential component of BIMTECH's research and education mission. Its principal mission is to support the learning, teaching, research and community programmes of the Institute by providing seamless and timely access to high quality scholarly information and learning materials to meet the needs of faculty, student and staff.

The Knowledge Centre housed in a beautiful two-story, fully air conditioned, building centrally located in academic area. Currently, it has a book collection about 20,000, and subscribes to about 100 print journals. It has an access to more than 6000 journals online and 13000 company databases. In addition, it has a CD-ROM collection of more than 1500 titles and a special collection of photographs about 13,000 in number.

BACKGROUND

Over the last couple of years, there have been major changes in the library automation arena. These changes have completely eclipsed developments that took place in the field of library world in earlier periods. Now, whether big or small library, the fourth generation library automation software became mandatory to manage the 21st century information resources and to meet the today's user requirements. As we look at the recent developments that have transpired over the last few years or so, we see an incredible amount of progress in library automation that help librarians to compete better than ever. It is important for libraries to have technologies in place that will optimize delivery of content and services in the context of today's Web.

Recent developments in information technology have provided new ways of dealing with information in academic libraries. The exponential growth of the web, changing nature of publishing industry and the increasing demand from users in general have created challenges and, hence, provided huge opportunities for those working in library and information professions. Today, The library collection and services are comprises of variety of forms such as CD-ROM/DVD-ROMs, E-books, E-journals, subscription of full text as well as bibliographic databases, free web resources, consortia approach for resource sharing, and

subscriptions to various information services. Providing a consistent, easy-to-use interface to these services should be a primary goal of any present library and information centre.

This issue has been the centre of BIMTECH's Knowledge Centre development in recent years. The Knowledge Centre has witnessed a significant growth in its collection and services during last 5 years. Apart from the printed materials, digital resources have grown in unmanageable size, forcing the library to look into its better management and use. Further, Users' expectations from system are very high as they are looking forward to have the provision to access the digital resources from their desktop.

By 2005 the knowledge centre had computerized most of its routines including circulation system with VIDYA - a commercial library management software. But the VIDYA did not have capability to handle the complexities involved in the efficient and responsible management of electronic works of all kinds. Another drawback of VIDYA was that it does not support web technology.

In October 2007, the Knowledge Centre made the decision to migrate to a new system. This study describes the one-year process undertaken over the period from October 2007 to October 2008.

MIGRATION TO A NEW SYSTEM

A Library Automation Advisory Committee was formed to address the issues and concerns of library automation at the Knowledge Centre. The committee consisted of library professionals from Delhi, University of Burdwan and P K Kelkar Library, IIT Kanpur. While forming the committee a due importance was given to include the persons who have direct involvement with library automation in their respective institution.

The first meeting of the committee was held on October 2007. The committee was assigned the responsibility to prepare an automation plan with a focus to need assessment of Knowledge Centre, software selection, cost effectiveness, and implementation of new generation integrated library management software.

NEED ASSESSMENT

The committee had done a preliminary study about Knowledge Centre's services, procedures, and functions. After a detailed observation and discussion about current system, problems, requirements and future needs, the committee had defined broad functional capabilities for proposed system. The system which should be selected, must:

- support all library functions, including acquisitions, cataloguing, serials control, circulation, and online catalogue;

- be web-based;
- compliant to international standards viz MARC 21, UNICODE, XML, etc.;
- support attachment of digital objects locally and remotely in a range of formats viz. .pdf, .doc, .jpg, .html ; be capable to link internet resources;
- support database security at module and function level;
- have the facility of online reservation and cancellation on loaned items;
- have provision of management of binding;
- be capable to manage shelving location at item level, not to record level (in case of multiple copies of a document having different shelving location);
- be able to print Accession Register;
- support downloading of MARC record from external databases;
- save search results from OPAC;
- be capable to limit the search by document type, year, language, etc;
- support Z39.50 integration;
- support maximum integration of resources into a single interface;
- duplicate checking for Accession number and authority file;
- support RSS feeds;
- have the facility to publish library notice/messages;
- generate essential management reports;
- easy interface for Database backup; and
- be capable to print call numbers and barcodes.

SOFTWARE SELECTION

After defining the requirements, the committee entered into the most crucial decision making process i.e. software selection. The identification of suitable software for a given environment is most challenging task. It involves lot of reading, discussion, and testing. The selection process must consider both practicality and economics. Our's approach was two-fold, on the one hand, the system selected should meet our defined

Application server layer

- Servlets and JSPs - Tomcat web server (open source)
- Struts frame work
- Enterprise Java Beans - Jboss Application Server 3.2.1 (open source)
- JDOM (open source)
- XCQL – CQL parser(open source)

Database

- EJB - Entity beans (Container Managed Persistence) and SQL used:
- Porting from one database to another is much easier
- Postgresql 8.0 (open source) database server is the default database server used

C. **International Standards**: MARC-21, AACR-2R, MARC-XML, z39.50, SRU/W, OAI-PMH , UNICODE 3.0, UTF-8, Dublin Core, ISO-2709

D. **Functional Module**:

- **Acquisition**: Indent processing (also supports online requests by users through OPAC), Approvals, purchase order, receipts and invoice processing, Claims and cancellations, budgeting and accounting, mode of acquisitions: firm orders, On-approval purchases, standing orders, solicited and unsolicited gifts, Accession received items, quotation monitoring, management information reporting.
- **Cataloguing:** Import MARC records from public domain, creating/editing records possible in three template: Simple, General and MARC 21, Vocabulary control through authority files, search catalogue, support cataloguing for conventional materials (e.g., monographs, serials) as well as newer forms of materials (Web resources, music, video, images, etc., provision for digital attachments and web links, multilingual data entry.
- **Serials:** New subscription, Renewal, orders, registration of issues, claim monitoring for non-receipt issues, budget based invoice processing, serials binding management.
- **Circulation:** Charging, discharging, renewal, recall, built-in traps for delinquent users, reservations, overdue charges, user

privileges, inter library loans management, binding management, weed out, support for all barcode standards, RFID support.

- **OPAC:** Basic, Advanced and Expert search options with search limits, google- like free-test search, downloading of search results, new arrivals, circulation data, reservation and renewal on loaned items, cancel reservation, define SDI profile, Request addition of new publication, library message, help, top stories, RSS feeds.

E. Administration and System Setup:

Allows system administrators to configure parameters specific to the library in various functional modules; General parameters: library name, department, course, form letters, holidays, top stories RSS feed, MARC data sources, SRU/W servers, general setup parameters, Acquisition parameters: budget heads, allocations, vendors, currency, conversion rates, approving authorities, etc.; Technical processing: authority files, material types, shelving location, accession series; Serials parameters: renewal parameters, binding specifications, etc.; Circulation parameters: patron data, patron categories, priviledges; **Automated email/instant messaging** integrated into different functions of the software

IMPLEMENTATION OF NEWGENLIB

The committee devoted significant amount of time to examine issues of specific relevance to Knowledge Centre's requirements. Having gone through the functional testing on Test Server with our defined core specifications, we finally installed the NewGenLib server (version 2.1) for production purposes on February 16, 2008. The server was running on Windows platform. The next step was to configure the server to listen to a group of IP addresses ensuring the access of client to the server. On each staff PC NewGenLib client was installed and configured. It is important that one should define the various system parameters before using the functional module of NewGenLib. We defined the different parameters by using *Configure System* option of *Administration* menu of NewGenLib as per our local needs and practices. This included library name, financial year, budget head, budget allocation, local budget currency, foreign currencies, conversion rates, patron categories, patrons, departments, circulation privilege matrix, staff access privilege to respective functional modules, vendor, shelving locations, binder, etc.

Further, NewGenLib Desktop application was installed for reports and utilities. Another important configuration was End of Day (EOD) operation. The purpose of the EOD is to relegate the production of time-consuming outputs such as claim letters, e-mails to patrons, etc., to a

period of each day when the server is relatively free. But before this, one has to configure e-mail server first. At first, we were unable to configure the mail server, but after getting online support from Mr. Siddharth, main architect of NewGenLib, we were succeeded to configure it. Thus, the system was become ready for use.

STAFF TRAINING

Another challenge was to train staff and prepare them for change. The Knowledge Centre's staffs were not familiar with MARC 21 and so needed specific training. Initial training to staff was given by the committee members. Furthermore, we prepared 'How to do' manuals for each frequently used activity at Knowledge Centre. It has proved to be very useful for staff in relation to their day to day work. To provide better understanding of the NewGenLib system to the staff a "National Workshop on FLOSS based Library Automation" was organized at the Knowledge Centre during May 17-19, 2008. More than 70 participants from across the country attended the Workshop. The main resource persons were Mr. L. J. Haravu and Mr. Siddharth, the developers of NewGenLib.

On May 17, 2008 the Knowledge Centre's OPAC was inaugurated by Mr. Haravu and new information management system went online to users. There were more than 5000 catalogue records were available in the database at the time of inauguration.

CONCLUSION

Rapid growth in information technology continues to mould and challenge the library world. It would be helpful if librarians in the digital age will improve their IT skills to meet out this challenge. Open source technologies give libraries the opportunity to extend their services in present cutting edge information society. There are many open source software available for the beneficial implementation to help libraries automating operations and providing improved information services to users. Interestingly, one of these packages is from India. We, at Knowledge Centre, successfully implemented a new library management system by using NewGenLib, an open source software developed by KIIKM and Verus Solution, Hyderabad, India. Working on this project has been a very rewarding experience. We now have a system at Knowledge Centre that meets our current needs.

We are hopeful that the system will benefit from increased sustainability and portability with future releases of NewGenLib.

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Open Source Software for Libraries: Some Issues

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ABSTRACT

Developments in electronic and communication technology have affected every profession in the past decades and libraries are no exception. Libraries of all types are challenged to provide greater information access and improved levels of service, while coping with the pace of technological change and ever-increasing budget pressure. Faced with the increased commodification of information resources and services and the encroaching dominant logics of business/corporate culture, today's libraries are in search of innovative technological solutions to provide greater information access and improved levels of service, while coping with the pace of technological change and ever-increasing budget pressure. In response to this situation, a growing segment of the library profession is promoting Open Source Software. In this context the paper highlights the OSS for library activities, their benefits and factors to be considered while implementing OSS in libraries.

INTRODUCTION

The developments in Information and Communication Technology have affected every profession in the past decades and libraries are no exception. The growth of electronic information over the decades and the democratization of the Internet have paved the way for the emergence of new breed digital libraries and virtual libraries. Faced with the increased commodification of information resources and services and the encroaching dominant logics of business/corporate culture, today's libraries are in search of innovative technological solutions to provide greater information access and improved levels of service, while coping with the pace of technological change and ever-increasing budget pressure. In response to this situation, a growing segment of the library profession is promoting Open Source Software (OSS). OSS both as a movement and as a form of software development, offers a challenge to dominant proprietary models of software development. The basic idea behind OSS rests in its inverted logic of property, in which value is derived in the distribution and freely available nature of software code rather than in exclusive ownership over code (Weber, 2004). In this context the paper highlights the OSS for library activities, their benefits and factors to be considered while implementing OSS in libraries.

WHAT IS OPEN-SOURCE SOFTWARE?

Open source software is computer software for which the human-readable source code is made available under a copyright licence that meets the Open Source Definition. This permits users to use, change, and improve the software, and to redistribute it in modified or unmodified form. Open source software is often developed in a public, collaborative manner. Open source software is the most prominent example of open source development and often compared to user generated content. The basic idea behind open source is very simple. When programmers can read, redistribute, and modify the source code for a piece of software, the software evolves. People improve it; people adapt it; people fix bugs.

HOW OSS DIFFER FROM FREE SOFTWARE AND PROPRIETARY SOFTWARE?

Freeware software often differs from open-source software in-that freeware is created by may be one or a few people. Freeware is generally closed-source, although the source is sometimes available. The distinction, even if the source is available is that it is still maintained by a closed group. Anyone can join an open source group if they can prove that they can contribute anything of use to the project. Sometimes freeware is licensed for non-commercial use only.

The term "proprietary software" is often used to mean computer software which is neither free nor open source. A literal meaning of "proprietary"

in relation to software is that it has a copyright owner who can exercise control over what users can do with the software. However, the term is commonly used in a narrower sense to describe software with restrictions on use or private modification, or with restrictions judged to be excessive on copying or publishing of modified or unmodified versions. These restrictions are placed on it by one of its proprietors. In this sense it is also known as "non-free software" and is the opposite of free software, generally speaking.

WHY LIBRARIES INTERESTED IN OSS?

The changing information environment dominated by Internet technologies has given libraries new choices in meeting the information needs of their users. Libraries are taking up OSS as a way to reduce the costs of expensive commercial products and as a viable alternative to the often expensive proprietary library automation systems. The benefits of OSS can potentially reduce costs, give users more control and increase software performance (Courant & Griffiths, 2006). OSS certainly appears to give libraries more control over technological choices and an ability to bring library values to software. Mukhopadhaya (2005) identified the advantages in the use of open source software for library automation in India

- OSS is an economical alternative to libraries' reliance upon commercially supplied software.
- OSS is essential if libraries are to develop software and systems that meet their patrons' needs.
- OSS ensures that library systems and online services will be more functional for patrons.
- OSS democratizes the use of software applications in libraries irrespective of the type or size of the library.

OPEN SOURCE SOFTWARE FOR LIBRARY ACTIVITIES

In the last few years we have seen the development of a number of library software products in the open source world. Table-1 shows some of the major Open Source Software which can be used for various library activities.

Table-1: Open Source Software for Library Activities

OSS and URL	Supported Platforms	Dependency
Koha http://www.koha.org/	Windows (without Z39.50 support), Linux, and UNIX	Apache, Perl, MySQL (or any RDBMS)

PhpMyLibrary http://sourceforge.net/projects/phpmylibrary	Platform Independent	Apache, PHP, MySQL, Python
OpenBiblio http://obiblio.sourceforge.net/	Platform Independent	Apache, PHP, MySQL
GNU Library Management System (GLIBMS) http://sourceforge.net/projects/glibs/	Linux, UNIX	Apache, PHP, Perl, PostgreSQL
Avanti http://home.earthlink.net/~schlumpf/avanti/downloads.html	Platform Independent	Java Virtual Machine
PhpMyBibli http://phpmybibli.sourceforge.net/	Platform Independent	Apache, PHP, MySQL
PostgreSQL http://www.postgresql.org/	Linux, UNIX, Windows	Perl, Python, Tcl/Tk, JDK/Ant, Flex & Bison
MARC/Perl http://www.cpan.org/modules/by-module/MARC/	UNIX, Linux, Windows	Perl
Marc2Opac http://www.bundaberg.qld.gov.au/library/catalog/about.php4	Linux	Apache, PHP, Grep
NewGenlib http://www.verussolutions.biz/web/	Platform Independent	Java, PostgreSQL
Greenstone http://www.greenstone.org/	UNIX, Windows, Linux, MacOS X	Apache, Perl, GDBM
DSpace http://www.dspace.org/	Platform Independent,	Apache, Tomcat, PostgreSQL, Java
iVia http://infomine.ucr.edu/iVia/	Linux	Apache, MySQL, Berkeley DB
Fedora http://www.fedora.info/	Platform Independent (with Java)	Java SDK, MySQL/Oracle (optional), JDBC

E-prints http://www.eprints.org/	Linux, UNIX	Apache, Perl, mod_perl, MySQL
CDSWare http://cdsware.cern.ch/	Linux, UNIX	Apache, MySQL, PHP, Python, WML
Harvest http://harvest.sourceforge.net/	Linux, UNIX, Windows	Apache, Perl, GDBM, Bison, Flex,

BENEFITS OF OSS

Motivations for using and developing open source software range from philosophical and ethical reasons to pure practical issues. The first perceived advantage of open source models is the fact that open source software is made available gratis or at a low cost. Some of the benefits of OSS are:

***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.

***Escape vendor lock-in*:**
Frustration with vendor lock-in is a reality for all IT users. 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.

FACTORS TO BE CONSIDERED WHILE IMPLEMENTING OSS

The selection of software for library activities is driven by the nature of collection, availability of skilled staff, budget, and management support. Thus while considering the OSS for libraries, they have to focus on the following factors.

Software Acquisition Cost
Some proprietary products have very low software acquisition costs. Other products can have high acquisition costs. In some cases, nonprofit organizations can get many software packages or web-hosted applications donated or at reduced costs, which may reduce or eliminate the acquisition cost for the software. Sometimes, however, organizations are limited in how many copies of a product will be reduced-price or donated. Virtually all open source software is available for no acquisition cost whatsoever, and no multiple licenses are needed.

Implementation costs
For some software, implementation is quite easy, and will take a staff person 10-30 minutes to install. More complex applications take days of staff and/or consultant time to implement, and convert information from an old system. When evaluating the options for a particular solution, be aware that in some cases open source projects can be more difficult to install than their proprietary counterparts, especially if the folks doing the installing are new to OSS. It is worth looking carefully at the

installation documentation for any solution you are planning to implement. If your organization will need consultant support, you may find it difficult to find consultants who are familiar with free and open source technologies. If you now depend on a consultant who is unfamiliar with them, you may need to consider sending them to training or seeking out a different consultant in order to smooth your move to free and open source technologies.

Hardware costs

In many situations, you will be implementing software on existing hardware, so you will not incur additional hardware costs. However, if you are implementing a new kind of server, or replacing an old server, hardware costs will likely be an issue. In general, the larger your network needs the more hardware savings you are likely to realize with the OSS operating system and other OSS on your server. Recent research has found that servers based on Linux (as opposed to Microsoft Windows) can handle more traffic, hold more accounts and do more processing given the same hardware. Thus in a situation where you might need multiple Windows servers, fewer Linux servers will meet your needs.

Training costs

For end-user solutions like office applications, financial packages, etc. training is by far the most costly part of implementing new technology. Staffs who are going to use this software on a day-to-day basis must be trained to use it, and learn to use it. Most non-technology staff will be unfamiliar with non-Windows operating systems and applications, so implementing an open-source solution that replaces a well known and used application on a widespread basis must be considered carefully. For software that has little or no end-user impact the only training costs to think about are training your technology staff to handle the new systems. These costs become a larger factor when a) you rely on in-house staff, rather than outside consultants, to support the solution, and b) your in-house staff does not have experience using OSS.

Maintenance cost

Some software products have annual fees of some sort. For all practical purposes they can be thought of as annual license fees, since they are typically calculated as a percentage of the original software license acquisition fee. These fees should be included in your TCO analysis. Most OSS has no annual maintenance fees, since it had no license acquisition cost to begin with. Some enterprise-level Linux distributions (like RedHat) do have annual maintenance fees, which entitle you to prompt on-demand support. However, very few nonprofits fit into the categories of organizations that would make use of these enterprise-level packages, and they are not mandatory it is possible to use the equivalent

of RedHat for example (it is called Fedora,) at no cost. Annual fees for web-based software may be quite low, especially when only a small number of users access it, but they also can increase without warning, and new users can push you into a new fee bracket

Upgrade costs

Keeping software relatively up to date is important. It increases stability, security and features. It is not necessary to upgrade at every version change, but it is critical to install security patches, and when features that you want are improved, or there are dramatic stability improvements, upgrading is important. Obviously, the cost of upgrading a single copy of a software product is much less expensive than having to do a site-wide upgrade. You can often get upgrades of proprietary software at discounted fees or donated. The vast majority of open source software has no upgrade fees at all. You can simply download the upgraded version, and install.

Administration Support OR Technical support

Support may be sometimes difficult to understand because it is frequently aimed at developers and not end users. All software whether applications, databases or operating systems requires administration and support of some type. In some cases, you will have your staff provide the support; in other cases, you will hire consultants to do it. Characteristics of the software that determine the level of support needed include how reliable the software is, how vulnerable it is to security problems, and how complex it is to use both for end-users and the administrator. Factoring these into your consideration of OSS is important.

CONCLUSION

Open source and its benefits over proprietary software has always been a subject of dispute among user groups, as well as within the IT vendor community due to the speculations surrounded around open source. As Eric Raymond (2001) correctly observes, the initial development of an open source project often depends on the vision of an individual, but it will only be successful through sustained effort at community development. Community building is thus an important theme in developing a set of best practices for library open source softwares. Any set of best practices will need to include the various issues of funding and management structure, leadership, code development, community building, and technical and financial sustainability. These issues are not necessarily particular to libraries, but nonetheless they need to be resolved if libraries are to be successful in developing and maintaining open source softwares.

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Total Quality Management (TQM): Requisite for Libraries to Succeed and Survive in Digital Environment

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ABSTRACT

This paper has discussed the implementation of TQM and its application to libraries. Quality is considered as the most powerful factor to capture, retain and enlarge users' base in the modern library scenario. Achieving users' satisfaction is the essential duty of quality library management is the most effective endeavor policy. The state-of-the-art quality management is an embodiment of concepts, methods and applications. In the last few years, the library world has stood witness for many practical success narratives. Planning and achieving higher level of quality service is fundamental to the successful operation of library, which necessitates understanding and managing various dynamics in library in order to set goals and thoughtfully deploy library resources. Libraries are ideal places to implement TQM. Libraries are service organizations dedicated to their customers, the patrons. By formulating a strategic plan, and following it with a commitment to continuous quality improvement, library managers can transform and improve their organizations. The efficiency and effectiveness with which library resources are obtained and utilized will depend upon the library management practices that the library follows. Quality management also necessitates how well the library system measures, monitors and improves different metrics related to the library processes. This article introduces the concepts of quality management to information and library managers and information scientists and suggests how the strengths of the quality movement can be harnessed. The first part examines what is TQM and its rapport with LIS, and shows how TQM can contribute to improved performance and effectiveness.

Keywords : Quality, Management, Standard, Leadership, Users' Satisfaction, Efficiency, Product, Quality Control, Teamwork, Solidarity, Marketing

INTRODUCTION

TQM is an attitude and method for rapid improving the services and/or products offered to customers. New technologies and ICT have replaced national economic systems with a global economy. The organization irrespective of size and type that do not practice TQM can become globally non-competitive rather rapidly. This march towards non-competitiveness can be avoided if library staff is helped to become TQM practitioners. Therefore, the potential benefits of TQM can be applied to libraries. TQM can help libraries provide better service to its primary customers. The continuous improvement focus of TQM is a fundamental way of fulfilling the accountability requirements common to library reform. Innovative and interactive techniques can be applied to improve the interest of library users. Therefore, the environment for learning is improved. Different techniques can be used for libraries are discussed in this paper. TQM, as its name implies, related to the monitoring of quality throughout the organization by everyone in that organization. This means that if problems are spotted during the production process or service, it is the responsibility of that person to solve the problem before it goes any further through the process. This way, problems should be identified before they ever get near the users but if they do, every effort is made to sort the problem out with the minimum of argument. To support the emphasis on quality, firms are also looking to get external verification for the standards that they are projecting to their customers. Various scholars have define total quality and explain how it can benefit performance and effectiveness, relating the basic principles to a library setting with particular emphasis on mission, measurement, charters, and customer needs.

WHAT IS QUALITY

Quality is often used synonymously with excellence. However, for proper quality management, defining quality and its measurement are essential. Quality has been defined variedly in different contexts. There is wide range of definitions or approaches to quality, describing the relative nature of the concept in the context of library management. Some of the important terms involved in TQM are given below:

i. Exceptional (high standards library services);

ii. Uniformity; (consistency in library services)

iii. Appropriateness for purpose (meeting stated purposes);

iv. Value for Time; and (Save the time of user: 4th law).

v. Transformative (transformation of the library users).

"The term quality defies any definition which will be universally accepted. When it is linked to performance, quality implies evaluation for comparative purposes; 'measures' of quality involve norms and standards and judgments of quality are assisted through use of norm or criterion referenced indicators. Where measurement focuses on the student as a product of education, quality is seen as `value-based' by the process of education. When the emphasis is management of quality, attention focuses on strategies for achieving or improving quality." Quality inbuilt following approaches:

i. Inspirational approach (Quality always exists)
ii. Service based approach (Library Products meeting high quality standards)
iii. User based approach (quality to meet user's requirements)
iv. Library -based approach
v. Time-based approach.

CONCEPTS

The concept of TQM was developed by an American, W. Edwards Deming, after World War II for improving the production quality of goods and services. The concept was not taken seriously by Americans until the Japanese, who adopted it in 1950 to resurrect their postwar business and industry, used it to dominate world markets by 1980. By then most U.S. manufacturers had finally accepted that the nineteenth century assembly line factory model was outdated for the modern global economic markets. The concept of TQM is applicable to libraries. Many librarians believe that the concept of TQM provides guiding principles for needed library reform. TQM is the art of managing the whole to achieve excellence. The golden rule is a simple but effective way to explain it. TQM is defined as both a philosophy and a set of guiding principles that represent the foundations of a continuously improving organization. It is the application of qualitative methods and human resources to improve all the processes within an organization and exceed customer needs now and in the future. TQM integrates fundamental management techniques, existing improvements, and technical tools under a disciplined approach (Talukder and Ghosh, 2004).

OBJECTIVE

A library should focus on providing the best services possible, and be willing to change to serve its customers. To determine if changes need to be made, a librarian might ask: What are our target markets? What do the customers come in for? How can I look at the efficiency of my library? How do we serve the current customers that exist today? First learn

about the customer, and then solve the problems. The study of TQM of library and information systems and services becomes crucial. This paper intends to study the application of TQM to the provision of library and information services. The precise aims of the present study are to:

i. To identify the concepts of excellence and TQM;
ii. To analysis the quality assertion in LIS;
iii. To recognize and study the relevance of TQM to LIS;
iv. To argue the standard for TQM in providing quality information services.

TOTAL QUALITY MANAGEMENT

Basically, TQM is a business philosophy that seeks to encourage both individual and collective responsibility to quality at every stage of the production process from initial design and conception through to after sales service. Many businesses may not use the term TQM anymore but the philosophy is still very much part of most business thinking. It is seen as being a way in which a business can add value to its product and to gain competitive advantage over its rivals. The former may allow a business to charge a higher price for its product or service whilst the latter can be a key feature of its marketing programme. Total Quality Management takes an integrative approach for assuring quality in an organization. The four basic principles explain the nature of Total Quality Management. ReVelle, J.B. (2003) reveals that those of us who are confirmed members of the Total Quality Management (TQM) movement believe there are three major aspects of TQM and it is only when all three are employed together that we have a complete TQM effort. These components are: the cultural aspect, the technical aspect, and the managerial aspect.

QUALITY ASSURANCE STUDIES

The introduction to quality concepts also outlines Quality Assurance Standard ISO 9000, and the appendices feature criteria for information science, and a model mission statement and charter. Quality assurance studies were mostly restricted to special libraries and academic libraries. Although quality assurance studies based on ISO 9000 and other accreditation schemes were conducted in libraries in UK, USA and Canada, such studies are rarely reported in Indian libraries and information systems. The quality assurance initiative in LIS has primarily come from the parent organization to which it provides services. However, in the later years, the quality assurance system has become as essential feature of LIS management. Quality studies in LIS are mostly isolated and are made on different aspects of library management, services, user-studies, etc. The evidence produced by the few TQM cases in the LIS sector indicates that TQM is a highly relevant

management theory for information sector. The information products in LIS Sector can be Information Abstracts, Bibliographies, indexes, Current Awareness Bulletins, etc. These products should be produced according to set norms or criteria (like - following CCF; circulation before the information becomes obsolete). User-based approach lies on the idea that quality lies in the eyes of the beholder and that the customer or user is the ultimate quality judge.

ISO 8420 defines quality as: `the totality of features and characteristics of a product, process of service that bear on its ability to satisfy stated or implied needs'. However, there are certain limitations to this approach. The usefulness of user-based quality definition is dependent on how well the library user is informed about opportunities and limitations of a product or service offered. User satisfaction level may also vary in terms of value for money and value for information content received. In the value-based definition, quality is defined in terms of costs and prices. Thus, a quality product is one that provides conformance at an acceptable price or cost.

KEY COMPONENTS AND SUPPORTS

Following are four major component and supports of TQM for libraries to improve its images in the eye of library users are:

Synergistic Associations

According to this principle, a library must focus, first and foremost, on its services and users. In a TQM library, everyone is both a services provider and information supplier. This confusing concept emphasizes "the systematic nature of the work in which all are involved". In other words, teamwork and collaboration are very essential. Traditionally, library services have been prone to same for one and all. Now, this outdated practice no longer serves the library users because of specific needs. To survive in a world technological competence teamwork and collaboration result in high-quality benefits for the greatest number of library users. The very application of the TQM to library services emphasizes the synergistic relationship between the "library services" and "library users". The concept of synergy suggests that performance and library product is enhanced by pooling the talent and experience of library staff.

In a library, library staff and library services are the same as of management front-line personnel and their production. The library product which is generally its services is responsible for the development of library user's capabilities, interests, and character. Viewed in this way, the librarians and the libraries are suppliers of effective learning tools, environments, and systems to the users who are the libraries primary

customer. The library is responsible for providing long-term services welfare of users by literate them with new techniques and facilities available to them. Also, how to access quality services in their own work by maximizing opportunities for growth in every aspect of their studies.

Constant Development and Self Assessment

The TQM applied to libraries is the total dedication to continuous improvement, personally and collectively. Within a Total Quality library setting, administrators work collaboratively with their customers the library users. The foundations for this system were apprehension, intimidation, and an adversarial approach to problem-solving. Today it is in our best interest to encourage potential library users by dedicating ourselves to the constant development of their abilities to seek information. Total Quality is, very essentially, it is positive approach which works to users ultimate advantage.

According to Deming, no human being should ever evaluate another human being. Therefore, TQM emphasizes self-evaluation as part of a continuous improvement process. In addition, this principle also laminates to the focusing on users' strengths, learning styles, and different types of intelligences.

Method of Continuing Process

Continuous improvement of all operations and activities is at the heart of TQM. Once it is recognized that library users' satisfaction can only be obtained by providing a high-quality product or services, continuous improvement of the quality of the product is seen as the only way to maintain a high level of users' satisfaction. TQM also recognizes that product quality is the result of processed services. As a result, there is a focus on continuous improvement of the library's processes. This will lead to an improvement in processed service. In turn this will lead to an improvement in product quality, and to an increase in users' satisfaction. The users-driven approach helps to prevent errors and achieve defect-free services. When problems do occur within the library services, they are generally discovered and resolved before they can get to the next library users. TQM as applied in libraries is the recognition of the organization as a system and the work done within the organization must be seen as an ongoing process. Total Quality speaks to working on the system, which must be examined to identify and eliminate the flawed processes that allow its users to fall short. Since systems are made up of processes, the improvements made in the quality of those processes largely determine the quality of the library services and product. In the new paradigm of scholarship, continual improvement of learning processes based on the performance of library services.

Direction or Leadership

TQM is a way of life for a library. It has to be introduced and led by top library management. This is a key point. Attempts to implement TQM often fail because top library management doesn't lead and get committed - instead it delegates and pays lip service. Commitment and personal involvement is required from top library management in creating and deploying clear quality values and goals consistent with the objectives of the library, and in creating and deploying well defined systems, methods and performance measures for achieving those goals. These systems and methods guide all quality activities and encourage users by all staff. The development and use of performance indicators is linked, directly or indirectly, to users' requirements and satisfaction, and to library management. The library staff must establish the context in which library users can best achieve their potential through the continuous improvement that results from library staff and users working together. Librarian who emphasizes content area library services and principle-centered services provide the leadership or direction, framework, and tools necessary for continuous improvement in the library process.

TOTAL QUALITY MANAGEMENT IN LIBRARIES

Users-Driven Quality

TQM is "a system of continuous improvement employing participative management and centered on the needs of customers" (Jurow & Barnard, 1993). Key components of TQM are employee involvement and training, problem-solving teams, statistical methods, long-term goals and thinking, and recognition that the system, not people, produces inefficiencies. According to Jurow & Barnard (1993) libraries can benefit from TQM in three ways:

(i) breaking down interdepartmental barriers;
(ii) redefining the beneficiaries of library services as internal customers (staff) and external customers (patrons);
(iii) reaching a state of continuous improvement

TQM has a user-first theory or orientation. The user, not internal activities and constraints, comes first. User's satisfaction is seen as the libraries highest priority. The library believes it will only be successful if users are satisfied. The TQM library is sensitive to users' requirements and responds rapidly to them. In the TQM context, `being sensitive to users' requirements' goes beyond defect and error reduction, and merely meeting specifications or reducing users complaints. The concept of requirements is expanded to take in not only product and service attributes that meet basic requirements, but also those that enhance and differentiate them for competitive advantage. Each part of the library is

involved in Total Quality, operating as users to some functions and as a supplier to others.

TQM in LIS

Total quality management can helps libraries to identify, analyze and assess qualitative and quantitative data that is relevant to their library services. These tools can identify procedures, ideas, statistics, cause and effect concerns and other issues relevant to their organizations. Each of which can be examined and used to enhance the effectiveness, efficiency, standardization and overall quality of procedures, products or work environment, in accordance with ISO 9000 standards.

In India, the library of the Indian Institute of Management, Lucknow (IIML) has been conducting innovative continuing professional development programs for professionals engaged in the library and information sector for many years. More than 30 such programs are employed in the context of library and information systems and services, in areas such as:

i. quality management;
ii. marketing;
iii. information technology applications;
iv. human relations; and
v. communication

Feedback from the participants has continually been revealing that the programs were very well received, and at times had even surpassed expectations. As a result, significant positive developments have also been seen to have taken place in many of the participants' library and information systems as far as their collection development, collection organization, service design and delivery activities are concerned (Raina, 2005)

According to Quality America, Inc. (ReVelle, 2003) the number of TQM tools is close to 100 and come in various forms, such as brainstorming, focus groups, check lists, charts and graphs, diagrams and other analysis tools.

In a different vein, manuals and standards are TQM as well, as they give direction and best practice guidelines to the library staff. TQM illustrate and aid in the incorporation of complex information such as:

i. Identification of target library users
ii. Optimistic and pessimistic forces affecting the library services
iii. Evaluation of library users needs
iv. Completion analysis

v. Market analysis
vi. Adaptation for new and bright ideas
vii. Efficiency change in library
viii. Preparation of various statistics
ix. Library staff and work flow

LIS and TQM: a rapport

The practice of quality management in LIS existed since the evolution of the subject itself, but the terminology used for these varied widely. Performance indicators; performance evaluation; evaluation of reference sources using check-list of criteria; Evaluation of Information Retrieval systems using Precision and Recall rations; Cost-Benefit and cost effectiveness studies; user surveys electing opinions on library services - all these studies make part and parcel of quality studies using different mechanisms of assessment and methodologies. In early 1980s, numerous studies were made on automated data validation, error rates and patterns, authority control which belongs to quality control in online databases. However, customer and employee satisfaction are seldom in focus.

Quality, with regard to the products of industries, depends on raw materials, vendor components, and different skills of performance of employees and production processes, and equipment that shows different degrees of performance. Similarly, quality with regard to library and information science or with respect to the processing of information services in the library depends on:

i. the collection of documents and their technical processing by applying certain techniques and methods;
ii. the skills of employees;
iii. equipment and processing;
iv. the span of time of service to be rendered; and
v. The attributes of services which are to be rendered.

From the above, it is clear that while quality in respect of industries fulfills the ultimate goal of user satisfaction, the same may be adopted in library and information centers. Quality in library services is most effective in user-oriented services (Talukder and Ghosh, 2004).

ADVANTAGES OF TQM

According to the practical evidences, the TQM principles help the libraries in following clauses:

1. Redefine the role, purpose and responsibilities of libraries.
2. Improve library as a "way of life."
3. Plan comprehensive leadership training for library users at all levels.
4. Create staff development that addresses the attitudes and beliefs of library staff.

5. Use research and practice-based information to guide both policy and practice.
6. Design comprehensive users-development initiatives.

In order to achieve the above as opportunities to the library scenario, in addition to patience, participatory management among well-trained and educated partners is crucial to the success of TQM in libraries; everyone involved must understand and believe in principles. Some personnel who are committed to the principles can facilitate success with TQM. Their vision and skills in leadership, management, interpersonal communication, problem solving and creative cooperation are important qualities for successful implementation of TQM.

Sirkin (1993) suggests some ways a library might use the principles of TQM to enhance library services.

i. Create service brochures and information kits
ii. Conduct a user survey about library services
iii. Improve signage
iv. Change hours of operation
v. Provide a more convenient material return
vi. Simplify checkout of materials
vii. Use flexibility in staff assignments
viii. Cooperate with local government
ix. Ask vendors to give product demonstrations
x. Give new staff a thorough orientation
xi. Create interdepartmental library advisory groups
xii. Improve the physical layout of the library
xiii. Track complaints
xiv. Develop an active outreach program
xv. Open satellite offices
xvi. Publicize new or changed services
xvii. Develop user and staff training materials
xviii. Target services to specific groups
xix. Offer electronic document delivery
xx. Follow the mission statement
xxi. Smile

Riggs (1992) sum up the remarkable principles of TQM as:

i. **Manage by fact**: make library decisions after careful analysis of data gathered with tools such as check sheets, histograms, and Pareto charts;
ii. **Eliminate rework**: library work is often labor intensive--simplify it and make sure it is done properly the first time;
iii. **Respect people and ideas**: staff are the library's most valuable resources, and they should be encouraged to point out problems without fear of management; and

iv. **Empower people**: trust library staff to act responsibly and give them the appropriate authority to make decisions that can improve the quality of work they do.

Finally, remember that TQM is not a "quick fix." It needs to be implemented gradually over a two- to three-year period.

OBSTACLES WHILE IMPLEMENTING TQM IN LIS

TQM implementation is not a success due to following reasons.

(i) Organizational Obstacles

The first is organizational context, such as a rigid organizational culture that is inflexible and a highly bureaucratic organizational structure and authoritarian management style. That is, the failures of TQM implementations are due not to external factors but to the failure of management to establish a proper system for its implementation (Shin et al.1998). This perspective argues that often managers are not fully aware, or perhaps ignore, what it takes to implement TQM successfully and achieve high performance.

(ii) Cultural Obstacles

The second is the cultural barrier, because TQM implementation involves a paradigm shift in management values and attitudes and it should fit the national culture of the firm if it is to be implemented successfully (Sohal et al.1998). Research on the culture barrier argues that management values differ significantly across national cultures that management is culture-specific and that managerial practices, such as TQM, must be tailored to fit the local culture. TQM is about transforming an organization's culture, yet with the expectation of establishing a quality infrastructure and eliminating middle management positions through attrition. It is difficult to make a change in organizational structures as TQM requires institutions to restructure. Resistance to change and people's attitudes are primary hindrances to implementing TQM in libraries. The other barriers are the problems of finding the money and time for training while maintaining current services in the library.

Miller and Stearns (1994) listed the following barriers to the implementation of TQM in libraries:

- the view that this is just another management fad of the day;
- management's fear of the loss control;
- employee reluctance to recommend changes because of fear of management;
- the business and industrial background of TQM might not lend itself to the non-profit sector, including libraries;

- TQM requires a long-term investment of time over several years as processes are analyzed and an organization's culture is changed – this can cause resistance; and
- other difficulties in these days of increasing financial and other pressures

Other research has focused on individuals within an organization. For example, (Reger et al. 1994) suggest that each person's response to an idea involves the cognitive process of interpretation, attribution and inference. This means that managers who propose the idea for quality improvement are convinced that it works and assume that employees will think so too). Candido and Morris (2000) describe TQM failure as the expression of differing desires, wants, needs and feelings at individual levels within the organization. However, the underlying causes of failure in the implementation of TQM may go beyond individual beliefs, expectations, cognitive processes of interpretation, perceptions, feelings, and desires to more deeply rooted unconscious archetypical projections on the part of each individual in the organization.

SUGGESTIONS

A successful TQM environment requires a committed and well-trained library staff that participates fully in quality improvement activities of the library. Such participation is reinforced by reward and recognition systems which emphasize the achievement of quality objectives. Ongoing education and training of all library staff supports the drive for quality. Library staffs are encouraged to take more responsibility, communicate more effectively, act creatively, and innovate. As library users come forward for a particular activity or services they must be suitably rewarded, TQM links reward to customer satisfaction.

Based on the above discussion and observations, following suggestion are made for the implementation of quality in libraries.

i. Quality Assurance of Library and Information System should be part of the Quality
ii. Assurance of library TQM project;
iii. There is a need to develop standards / norms for assessing quality of information services to libraries;
iv. There is a need to evolve methodologies and mechanisms for improvement of quality Library services;
v. More funds to be allocated for studying the quality of information services on project basis;
vi. Training of staff members in providing quality information services.

CONCLUSION

Successful TQM implementation requires a thorough understanding of critical success factors, barriers to achieving these factors, and managerial tools and techniques to overcome these barriers. Research in developed countries listed top management commitment to TQM, training for TQM throughout the library, customer focus and continuous improvement, and a focus on library staff involvement and empowerment as the key determinants of successful TQM implementation. TQM is focused on the understanding that libraries are systems with processes that have the purpose of serving library users. TQM calls for the integration of all library activities to achieve the goal of serving users. It seeks to impose standards, achieve efficiencies, define roles of individuals staff members within processes and the library as a whole, reduce errors and defects by applying statistical process control, and to employ teams to plan and execute processes more efficiently. It requires leaders who are willing to create a culture in which people define their roles in terms of quality outputs to customers. The outlook that the clientele bring to a library have a critical effect upon their awareness of quality. It is better to obtain a reputation for one or two factors which are important to clientele and to concentrate upon further developing those. Service delivery is like a hypothetical performance. If customers are to gain maximum benefit from a service, they must know how to use it. So, properly planned user education is a must for library services. Library support systems should reflect library users' priorities. It is important to find out which services can be automated without losing the personal touch. Getting feedback from the user is important to ascertain the quality of service. Potential users of library can be given a questionnaire to get feedback from them for improving service. The circulation desk staff is the front line staff who plays a critical role in library; first deal with inquiries/crises; manage the reader interface. The staff at public dealing must be carefully-appointed and be given periodic training to keep up-to-date. All library staff must receive training, including skill training; on the job guidance; retraining. Well-trained staff is the competitive weapon for better quality service in library. Teamwork plays a vital role in giving better quality service. People have to develop a culture and commitment towards quality service in library.

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Use of WINISIS/GenISIS Software in Creating Web-based Database of Faculty Publications in India

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ABSTRACT

The paper describes how the web-based database of publications of faculty members can be created and made accessible for users. The bibliographic information (author, title, journal, imprint, references, keywords, etc.) of the article is entered in the WINISIS. The whole procedure is done in WINISIS software and then the data is converted/up-loaded in GENISIS software to make accessible the web-based database of faculty publications its users. In the age of information technology, the librarians, the IT professionals and other organisations involve in the activity of information storage and retrieval are engaged in developing very costly software. The cost of such softwares is such that the small libraries cannot afford to buy them. However they wish to get their libraries automated and make the resources available to their users by applying very cost-effective software. This paper describes how the WINISIS software will be a boon for these types of libraries/information centres and users. The world is growing fast in all areas. The library cannot remained isolated from the changing scenario. The revolution of information technology changed the scenario of library services. Users can access this database from hostels, computer lab., class rooms, library through Intranet.

INTRODUCTION

Information retrieval (IR) is the science of searching for documents, for information within documents and for metadata about documents, as well

as that of searching relational databases and the World Wide Web. Automated information retrieval systems are used to reduce what has been called "information overload". Many universities and public libraries use IR systems to provide access to books, journals and other documents. Web search engines are the most visible IR applications.[1]

A digital library is a library in which collections are stored in digital formats (as opposed to print, microform, or other media) and accessible by computers.[2] The digital content may be stored locally, or accessed remotely via computer networks. A digital library is a type of information retrieval system.

The advantages of digital libraries as a means of easily and rapidly accessing books, archives and images of various types are now widely recognized by commercial interests and public bodies alike.[3]

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 is much lower than that of a traditional library.

A traditional library must spend large sums of money paying for staff, book maintenance, rent, and additional books. Digital libraries do away with these fees. Both types of library require cataloguing input to allow users to locate and retrieve material. Digital libraries may be more willing to adopt innovations in technology providing users with improvements in electronic and audio book technology as well as presenting new forms of communication such as wikis and blogs; conventional libraries may consider that providing online access to their OPAC catalogue is sufficient. An important advantage to digital conversion is increased accessibility to users. There in also availability to individuals who may not be traditional patrons of a library, due to geographic location or organizational affiliation.

FACULTY OF NATURAL SCIENCES

Faculty of Natural Sciences was established in 1981 with the departments of Physics, Chemistry, Mathematics and Geography. The Faculty is 28 years old. These departments were in existence since 1970. Three years later, the department of Biosciences was born and became a part of the faculty. Another addition to the faculty was made in 1999 with the creation of the Department of Computer Science. Thus, the faculty has following departments.

- Physics
- Chemistry

- ❖ Mathematics
- ❖ Geography
- ❖ Biosciences
- ❖ Computer Science

Faculty of Natural Sciences offers various diplomas, undergraduate postgraduate, and research programmes. A sample study conduced for the last five years of these departments show following details:

Table 1: Brief Profile of Faculty of Natural Sciences

S. No.	Department	Faculty Strength	Regular Students		Research Scholars	MPhil / Ph.D Awarded	Papers published
			Pass Outs	Presently Enrolled			
1	Physics	10	1000	50	15	15	60
2	Chemistry	14	995	60	21	14	45
3.	Mathematics	9	1100	60	17	18	55
4.	Geography	11	800	55	37	10	41
5.	Biosciences	14	600	40	15	10	41
6.	Computer Sciences	8	300	40	10	4	37
	TOAL	**66**	**4795**	**305**	**115**	**74**	**273**

The Web-searchable database was created in two phases. In Phase I database was created in WINISIS and in Phase II web-based database was created in GenISIS using the database already created in WINISIS.

PHASE-I

CREATION OF DATABASE IN WINISIS

The faculty at Jamia Millia Islamia in the field of Natural Sciences published the work in Journals, Conferences and books. The bibliographic elements on these publications have been identified. Since the publications have mostly bibliographic type of information, less numeric processing, therefore, it was decided to buildup the database using WINISIS. There were 984 papers published in the form of Journal Articles, 273 papers in the form of Conference Papers and 56 books.

Three machine readable databases were generated for the collected data on faculty publications, one each for journal articles, conference papers, and books published by the faculty members. The collected data was inputted in P-IV microcomputer using WINISIS. The data in the computer was arranged year wise, along with its outputs, such as main text, title index, author index, keyword index.

WINISIS software was chosen for developing the data base on the basis of its merits given below:-

1. WINISIS supports variable length field.
2. WINISIS provides a number of indexing techniques, which are essential for a database under study.
3. WINISIS provides user defined print format and it is possible to get desired output in desired format.
4. WINISIS provides facility to have very large number of records in its database.

Before designing the database, a study was made to identify the data elements fields, which were to be used in the database. All possible search and print output options were studied

DESIGN OF THE DATABASE

WINISIS uses Field Definition Table, Worksheet Format, Print Format and Field Select Table to create a database. The database of each publication form (Journal articles, Conference papers and book) was created in four steps. In first step Field Definition Table was created, in Second step Worksheet Format was defined, in third step Print Format was given and in last and fourth step Field Select Table was defined.

Field Definition Table

The FDT provides information on the various fields which are to be included and a number of parameters for each field. Various parameters such as length of the field, type of the field, subfields, and repeatable fields for each field were defined. Screenshot of FDT of Journal Articles is given in Figure 1.

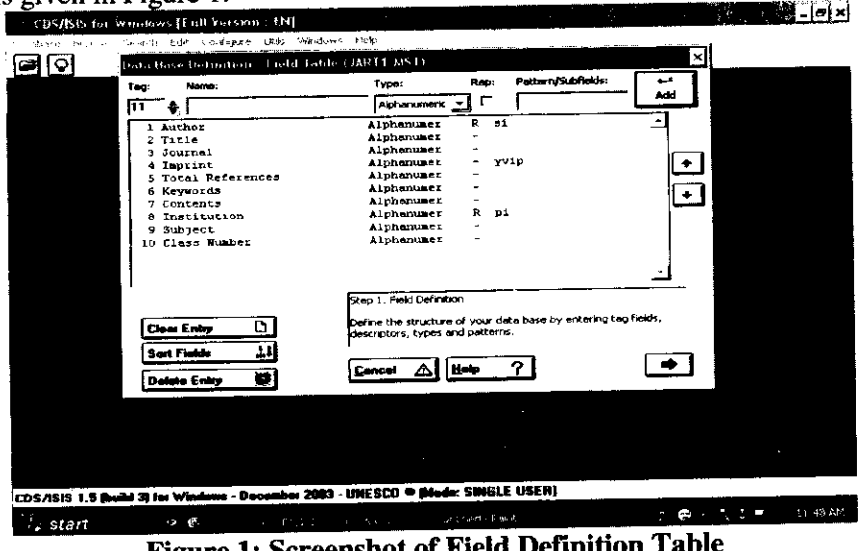


Figure 1: Screenshot of Field Definition Table

Data Entry

Data entry in WINISIS was done through data entry worksheets which have been defined previously. Screenshots of Blank and Filled Data Entry Worksheet of Journal Articles is given in Figure 2 and 3

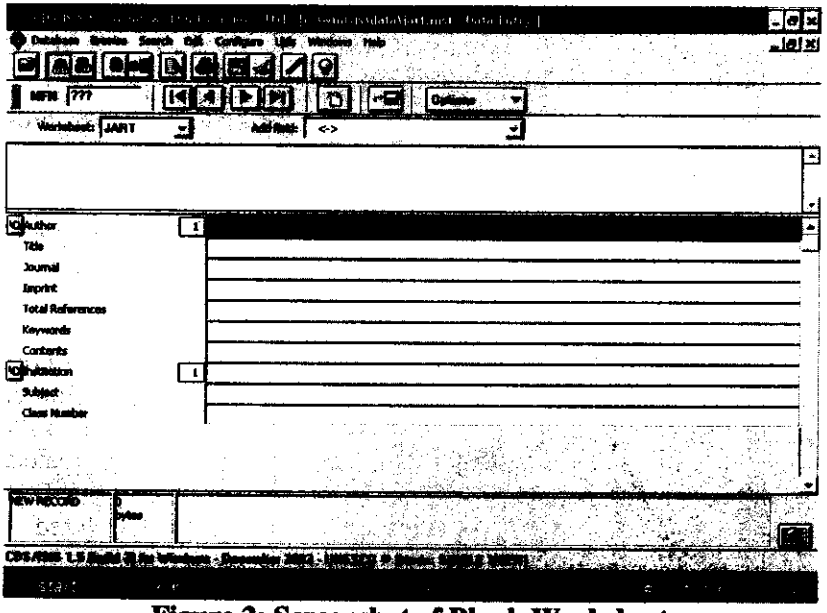


Figure 2: Screenshot of Blank Worksheet

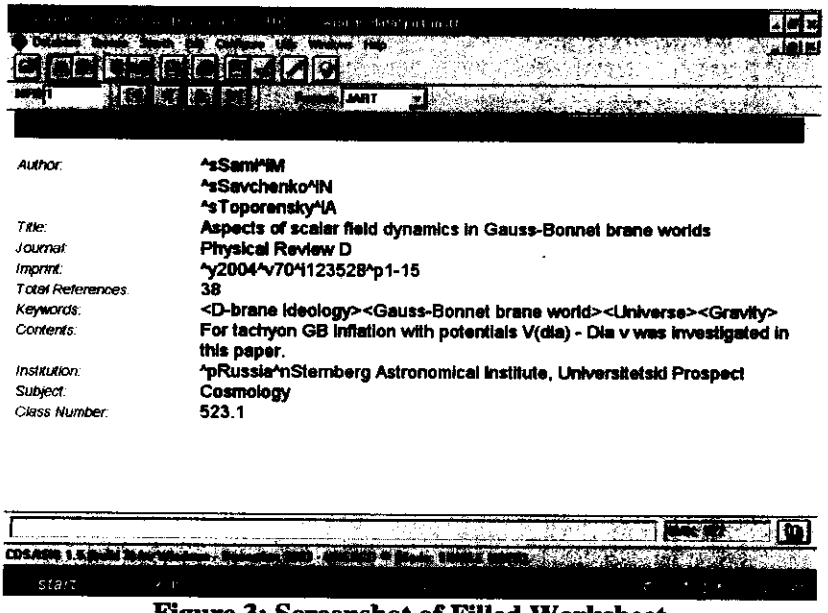


Figure 3: Screenshot of Filled Worksheet

Print Format and Field Select Table (FST)

Like-wise Print Formats and Field Select Tables for all three databases were created. Screenshots of Print Format and FST of Journal Articles are given in Figure 4 and 5.

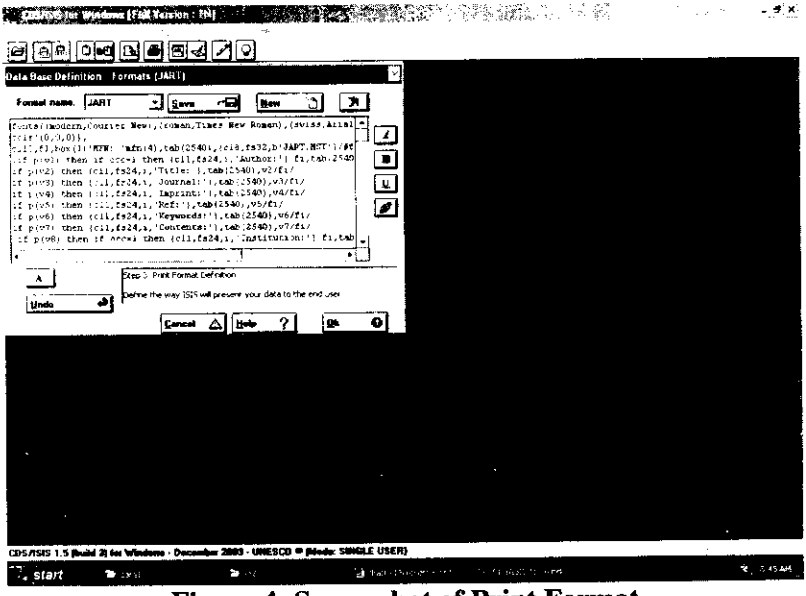


Figure 4: Screenshot of Print Format

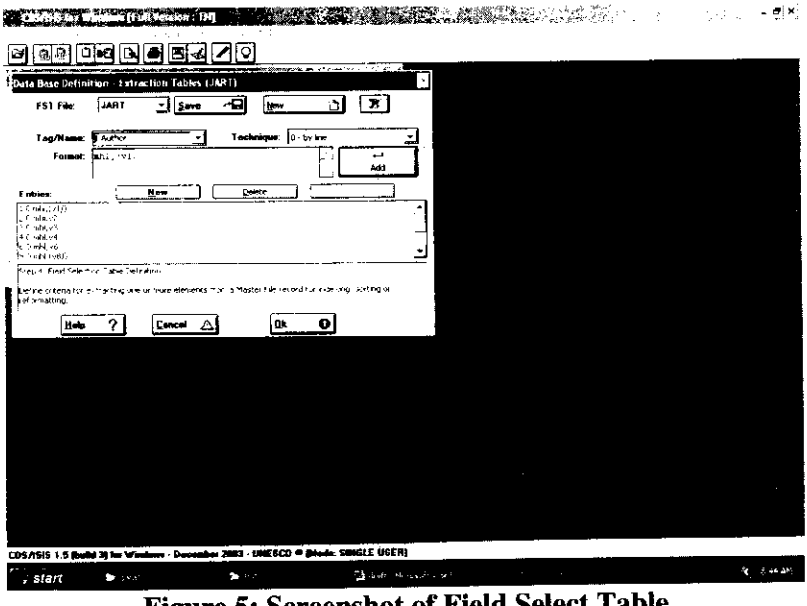


Figure 5: Screenshot of Field Select Table

By using different sorting options Author Index, Title Index and Keyword Index was generated. The indices show the record numbers along with the names. Samples of these indices for Journal Articles are shown below.

AUTHOR INDEX FOR JOURNAL ARTICLES

ABBAS. H 719
ABBURI. R 435
ABDULLAH. MIR 488
ABIDA 482, 530, 533, 593, 638, 654
ABID. M 583, 720, 721, 722, 754, 822, 823, 865, 896, 898, 954
ABULAISH. M 723, 724, 824, 940
ACHILA. R 880
ADEKUNLE. OK 783
AGARWAL. AK 980
AGARWAL. M 890
AGARWAL. MONIKA 891
AGARWAL. S 896
AGARWAL. SM 754
AGIER. JA 331
AGNIHOTRY. SA 639, 642, 725, 829, 830, 841, 941
AGRAWAL. S K 634
AHMAD. 640
AHMAD. A 825
AHMAD. ANIS 826
AHMAD. FAIZAN 005, 011, 015, 016, 019, 020, 021, 024, 025, 026, 034, 044, 053, 054, 066, 077, 088, 089, 095, 121, 136, 174, 175, 176, 214, 216, 234, 270, 271, 295, 370, 398, 432, 433, 468, 471, 524, 545, 573, 574, 600, 622, 627, 641, 747, 764, 765, 810, 874, 875, 900, 901, 902, 919, 948, 953, 956, 959, 976
AHMAD. G 584
AHMAD. I 134, 190
AHMAD. KHALIL 036, 048, 055, 096, 298, 299, 314, 475, 827
AHMAD. MS 326, 327
AHMAD. N 246
AHMAD. NASEEM 155, 197, 241, 300, 345, 346, 384, 422, 423, 424, 425, 585, 828

TITLE INDEX FOR JOURNAL ARTICLES

1-N-SUBSTITUTED THIOCARBAMOYL 1-3-PHENYL-2-PYRAZOLINES: SYNTHESIS AND IN VITRO ANTIAMOEBIC ACTIVITIES 722
INEQUALITIES FOR THE CLASS OF SELF-INVERSIVE POLYNOMIALS 071
4-4 HE ELASTIC SCATTERING AND VARIATIONAL WAVE FUNCTIONS 190
4F-4F ABSORPTION SPECTRA AND HYPERSENSITIVITY IN NINE-COORDINATE HO(II) AND ER(III) COMPLEXES IN DIFFERENT ENVIRONMENTS 679
4F-4F ABSORPTION SPECTRA AND HYPERSENSITIVITY IN NINE-COORDINATE PR (III) AND ND(III) COMPLEXES IN DIFFERENT ENVIRONMENT 680
4F-4F HYPERSENSITIVITY IN THE ABSORPTION SPECTRA AND NMR STUDIES ON PARAMAGNETIC LANTHANIDE CHLORIDE COMPLEXES WITH 1,10-PHENANTHROLINE IN

NON-AQUEOUS SOLUTIONS 599
A C-TERMINAL HYDROPHOBIC REGION IS REQUIRED FOR HOMO-OLIGOMERIZATION OF THE HEPATITIS E VIRUS CAPSID (ORF2) PROTEIN 524
A COMPARATIVE STUDY ON SERUM LEVELS OF TESTOSTERONE AND SHBG IN CARCINOMAS OF BREAST AND UTERINE CERVIX 462
A COMPLETE AXIOMATIZATION OF FUZZY FUNCTIONAL DEPENDENCIES USING FUZZY FUNCTION 814
A CONVENIENT AND NEW APPROACH TO THE SYNTHESIS OF OMEGA-HETEROCYCLIC AMINO ACIDS FROM CARBOXY LACTAMS THROUGH RING-CHAIN-TRANSORMATION. PART 2 SYNTHESIS OF (2R)-/(2S)-2-AMINOMETHYL-3-(1-ARYL-1-/1,5-DIARYL-AH-PYRAZOL-3-YL)-PROPIONIC ACID 811
A GENERAL AND EFFICIENT SYNTHESIS OF 3,6-DIAZABICYCLO (3.2.1] OCTANES 934
A KINETIC SCHEME FOR THE EARLY PHASE OF ATP HYDROLYSIS BY ACTOMYOSIN ATPHASE AND ITS BIOENERGETIC IMPLICATIONS 253
A KINETIC STUDY OF OXIDATION OF BETA-CYCLODEXTRIN BY PERMANGANATE IN AQUEOUS MEDIA 972
A KINETIC STUDY OF THE ONE-STEP THREE ELECTRON OXIDATION OF CITRIC ACID BY CHROMIUM (VI) 502
A KINETIC-STUDY OF THE REDUCTION OF CHROMIUM (VI) BY THIOUREA IN THE ABSENCE AND PRESENCE OF MANGANESE (II) CERIUM (IV) AND ETHYLENEDIAMINETETRA ACETIC-ACID (EDTA) 687
A MICROPROCESSOR-BASED MULTILOOP PROCESS CONTROLLER 058

KEYWORD INDEX FOR JOURNAL ARTICLES

(MO(CN)8)(3-) 177
(W(CN)8(3-) 177
1,10-PEHANATHROLINE 315
1,2,4-THIAZINE 813
1,4, EPROXY FATTYESTERIN 327
1-AND 2-NAPHTHOLS 065
1-BUTANOL 652, 743
1-METHYL 450
1-METHYL AND 2-METHYL PHENANATHRENES 440
1-NAPHTHOL 114
1-PENTANOL 479
2-ACETYLFURAN 720
2-ACETYLPYRIDINE 437, 720
2-HEPTANOL 743
2-METHYL 450
2-NAPHTHOL 114
2-2 BIPYRIDYL 2762,101
2+2 BODY PROBEM 266
3,4 BENZPHENANTHEREN 017
3,6 DIAZABICYCLO 934
3-AZATROPANE 980, 303, 15

4F-4F ABSORPTION SPECTRA 599, 679, 680
5 NITROTHIOPHENE-2-CARBOXAIDEHYDE 539
5-NITROTHIOPHENE-2-CARBOXALDEHYDE 594
5-NITROTHIOPHENE-2-CARBOXALDEHYDE.THIOSEMICARBAZONES 712
8-HYDROXYQUINOLINE 177
8-METHYL-3, 8-DIAZABICYCLO[3.2.1] OCTANE 980
9-METHYL 450
A-AMINO ACIDS 132
AB INITIO CALCULATION 777
ABNORMAL SEXUAL DEVELOPMENT 129, 130
ABSORBER 196
ABSORPTION 075, 227, 390, 711
ABSORPTION EDGE 180
ABSORPTION SPECTRA 008
ABSORPTION SPECTROSCOPY 329
AC SUSCEPTIBILITY 565
ACE INHIBITORS 918
ACETAMIDE 931
ACETANILIDE 966
ACETYLCHOLINE 263, 751
ACETYLCHOLINE ESTERASE 789, 034
ACID HYDROLYSIS 069
ACIDIC MEDIUM 362, 857
ACIDIC PH 435
ACINETOBACTER 330
ACRIDINE ORANGE DYE 962
ACROCENTRIC ASSOCIATION 129
ACROCENTRIC CHROMOSOMES 130
ACRYLATION 978
ACRYLIC-MELAMINE 710
ACTIVATION ENERGY 350, 614, 825, 826, 854, 899
ACTIVATION PARAMETERS 275, 851

PHASE-II

CREATION OF WEB-BASED DATABASE USING GenISIS

GenISIS is authoring software (for Win32) for visually producing web forms to query CDS/ISIS databases. There are two versions of the tool: GenISIS Web, for web publishing and GenISIS CD for developing CDRom interfaces for CDS/ISIS databases.

GenISIS was originally developed by the former IBISCUS Association (France) for UNESCO. The software is written in Microsoft Visual Basic. GenISIS was used to create web-based database because it is open source software and is available through UNESCO. It is very easy to create web searchable database using already created WINISIS database.

There are some merits and demerits of using it.

Merits

- Web query form (with field selection and index access)
- Display of query results
- Display of particular record's results

- ❖ Speedily search and accessible anywhere because web-based technology used
- ❖ Searching 'full text' and within 'full text is possible

Demerits

- ❖ Search is not possible within PDF files
- ❖ Physical components like images, charts, illustration, tables are not supported within articles.

GenISIS, basically implements the following steps:

1. Installation of Apache Web Server
2. Installation of GenISIS
3. Starting Apache Web Server
4. Starting GenISIS
5. Defining Display Formats
6. Testing of application
7. Exporting to a Web Server

HOW TO ACCESS DATABASE THROUGH INTERNET

The Web-searchable database created through the above mentioned process can be access through Intranet and Internet. In this study access through Internet is not possible due to high cost of purchasing dedicated server for hosting the database. The database is accessible through Intranet. The database can be searched by any of the fields defined in Field Select Table while creating it during WINISIS creation. A screenshot of Query Form in Browser Window is shown in Figure 6.

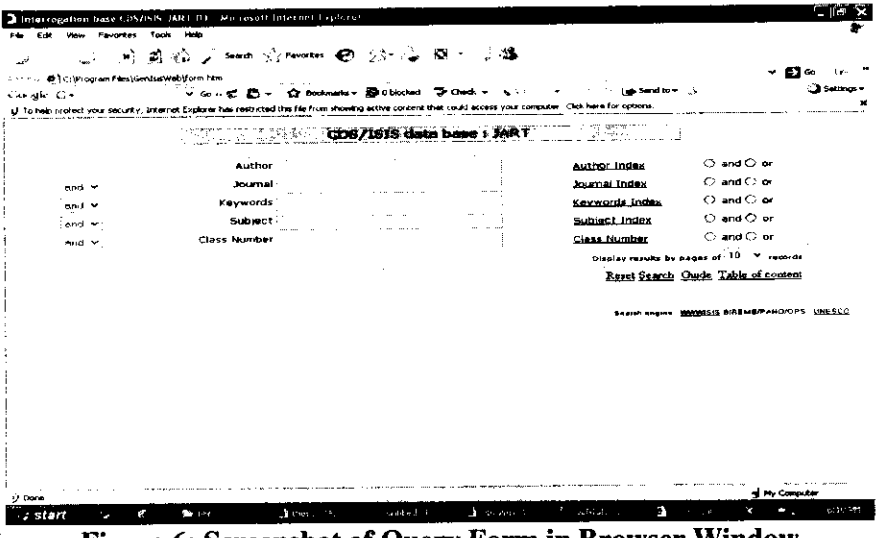


Figure 6: Screenshot of Query Form in Browser Window

The Figure 7 shows display results got after searching Author Field and the detailed display is shown in Figure 8.

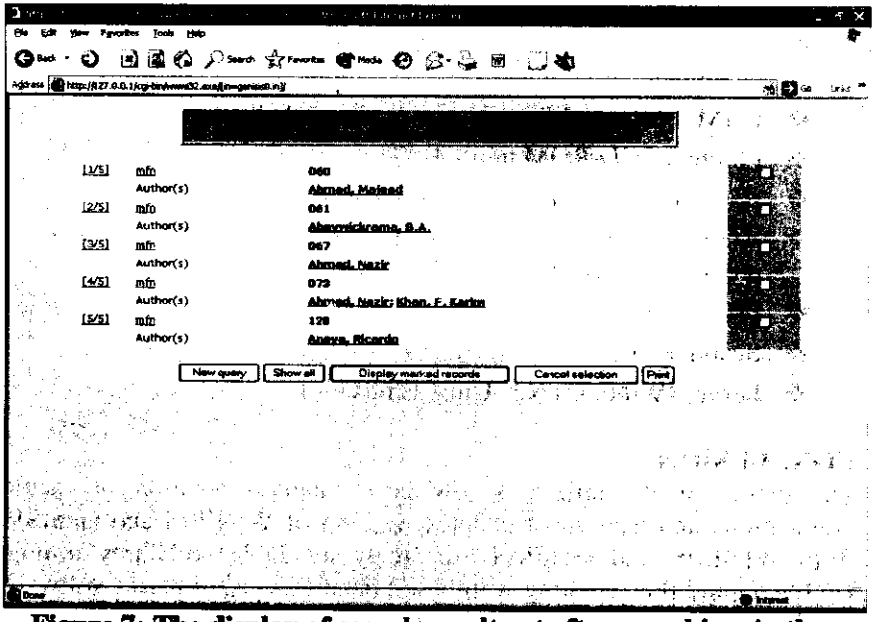


Figure 7: The display of search result got after searching Author Field

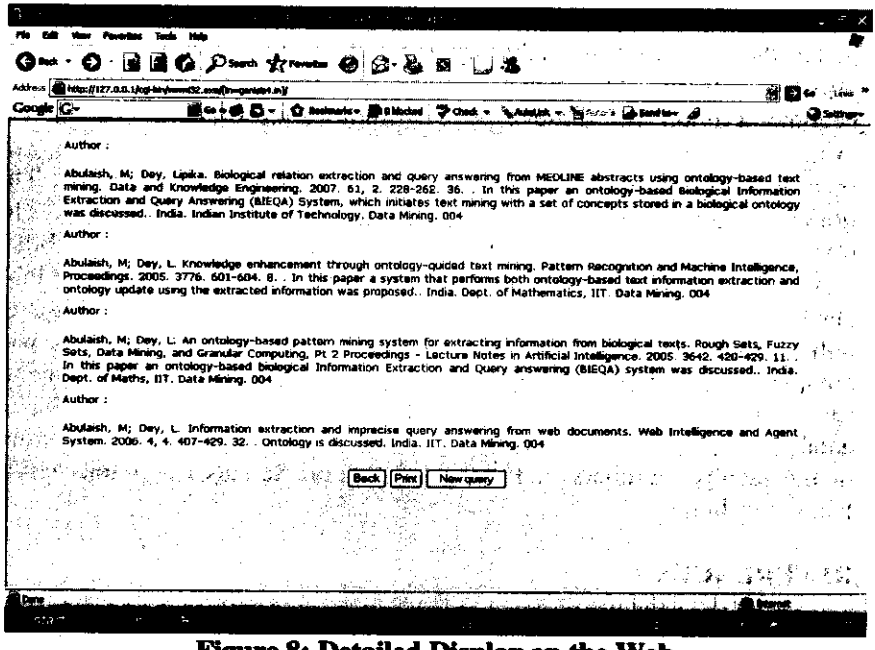


Figure 8: Detailed Display on the Web

HARDWARE AND SOFTWARE REQUIREMENTS

The minimum and recommended hardware and software requirements for running CDS/ISIS and GenISIS are following:

- CPU: 486 processor at 40 MHZ (Pentium at 100MHz or Higher recommended)
- RAM: 8Mb (16 Mb or more recommended)
- Floppy or CD-ROM unit - 1
- Hard Disk (with at least 4Mb free) - 1
- VGA 640*480 colour screen (super VGA 800*600 or higher recommended) - 1
- Printer - 1
- Scanner - 1
- Server (Windows NT, Unix, Linux) – 1

CONCLUSION

The theme of the article is low cost database creation of faculty publications and used most of latest version of WINISIS and GenISIS. Both WINISIS and GenISIS are freely available softwares through UNESCO and thus creating web-based databases using theses softwares is cheap. In the age of information technology, the IT professionals are designing effective but very costly software. The small libraries don't have budget to carry too much financial burden by purchasing these types of software. However they wish to get their libraries automated and make the resources available to their users by applying very cost-effective software. This paper describes how the CDS/ISIS software will become a boon for these types of libraries/information centres and information receiver. It is very cost effective method of creating web searchable database in it. The world is growing fast in all spheres. The library is not remained isolated from the changing environment. The revolution of information technology changed the scenario of library services. Users can access this database from hostels, computer lab., class rooms, library through Intranet. In the starting the database of publications of faculty members of Faculty of Natural Sciences was created. It next step it is proposed that publications of other departments can be made searchable using WINISIS and GenISIS. The web-based database created in above study will help in easy access to publications of the faculty members of Faculty of Natural Sciences at Jamia Millia Islamia in India.

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Competency for Library Professionals in the Digital Era

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ABSTRACT

As the changes occurred in library environment, the library and information science professionals should be acquaintance with different skills. The information environment is greatly changing throughout the word. Present rapid development in communication system and recent innovation in technology witness as changing emphasis in the role of information and its management. To cope with the rapid changes of the technology and to control the ephemeral rate of information generation, librarians along with professional colleagues should have to equip themselves as per the requirement of the electronic information society. This paper defines the digital library and analyses the changing role of the library professionals in digital environment and need of new skills for library professionals.

Keywords: Digital Library, Technology and Education, Internet, Digitization.

INTRODUCTION:

Academic librarians articulate their roles in academic by creating and implementing a range of practical strategic activities by weaving digital technology into the traditional functions of libraries for knowledge creation, dissemination and use. As many points out creations of digital resources and services is built upon traditional systems. However the format of information and tools for acquiring, organizing preserving and providing services are different in a traditional library model and a

digital library model. Thus the deployment of digital technologies and digital libraries within traditional library systems has many consequences for organizational structure, staff resources, workload and existing practices. It requires structures staff responsibility and activities within and between departments of the library to support changing needs. While making the best use of existing staff libraries need to revise current positions to recruit staff with new technological skills and efficient knowledge profits.

HARDWARE AND SOFTWARE FOR DIGITAL LIBRAIRES:

Hardware:

The minimum requirements of hardware for digital library are:

1. Computer
2. CPU, PCI, Bus, Ethernet, Silicon, Graphics, RAM
3. Storage Devices
4. Hard Drives, Removable hard drive, Optical drive, DAT drive (Digital Audio Tape), CD ROM drive
5. Monitors
6. Digitizing devices
7. Scanner, Digital Camera
8. Out Put Device
9. Printers Modem and CD Writer

4.2 Software:

These are number of software, which can be used for different function some of them are as follows:

1 Editing images
2. Page layout programmers: to integrate text and graphics
3. Page transferring utilities: to share files between computer platforms
4. File translation programmes: to convert files from graphics
5 File compression software.

The software which are used mainly for digital library are Greenstone, Dienst Eprints Archive software, Dspace etc. [4]

NEED FOR MANAGING CHANGE IN DIGITAL ERA:

Change is the law of nature. Who could have imagined that the whole structure and information resources of a library and the role of a Librarian will change in a dramatic manner? The recession and the escalation of the pace of technology change have given birth to a virtual library. Therefore, we the librarians keeping in view our changing and

dynamic role need to learn to live effectively with continual change—to constantly reassess ourselves. Our skills and jobs and if we fear change, find it threatening or fail to cope with it then we could sink without trace.

- We should know the basic skills concerning how to manage change. A variety of methods should be used, because change affects people differently. Other problems that cause change initiatives to fail are lack of training and not measuring whether the change is working.
- The services of the present hybrid library are based as much on access to digital information. As on access to physical objects and in particular where users are mush more mobile and present their demands at a variety of service points across a network. Services are expected to evolve rapidly, new technology needs to be exploited and this is possible by changing the information environment through effective education and training. The figure 1. shows the digitization process in the library.

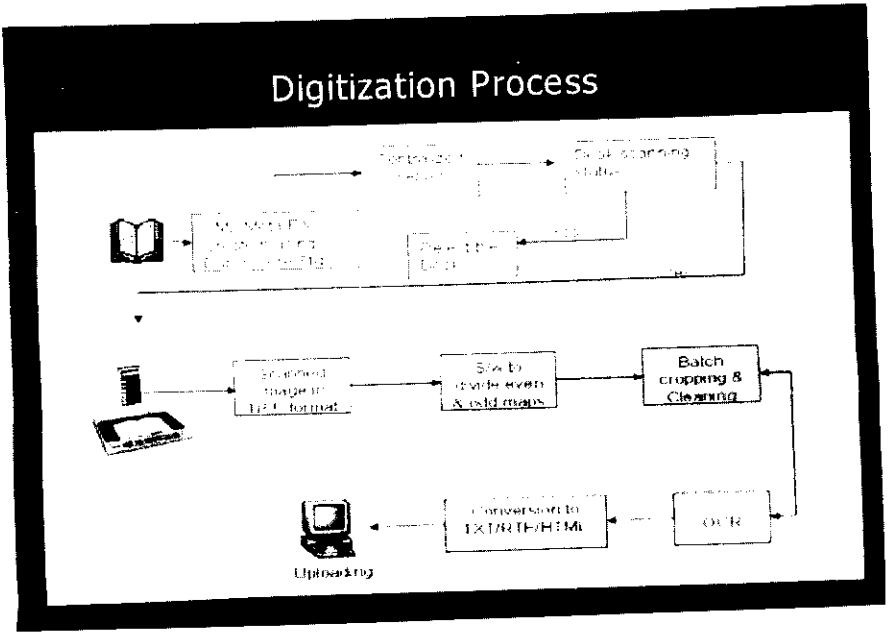


Figure1. Digitization Process {5]

NEW FACE OF DIGITAL LIBRARIAN:

The Librarian is forced to adapt with the fast growing technology. We witness the tremendous changes that took palaces in the library services such as infrastructure, content creation, collection development, user interface, information and knowledge management strategies etc. Digital

libraries are the library without physical boundaries. Patrons could access the information at any place, any time, any where and in any format. The expectations from the users have gone up into a high level that the librarians are trying to meet with continuous learning.

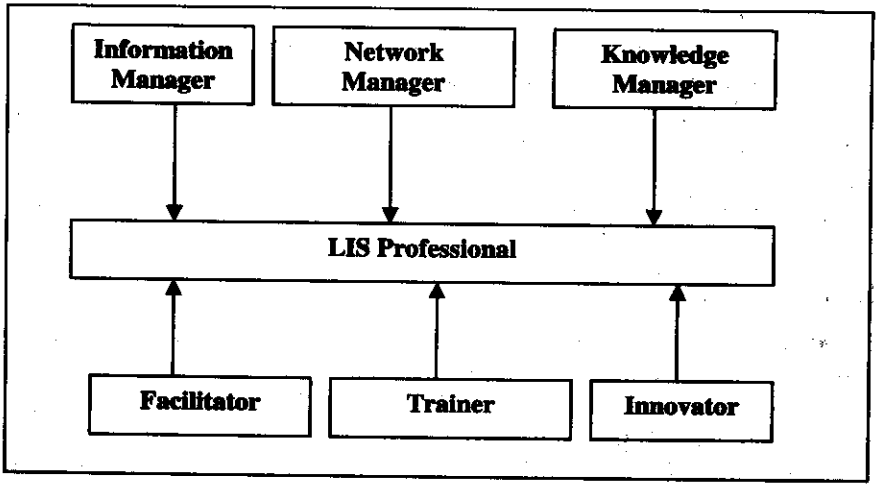


Figure 1: Multifaceted LIS Professional

Information Manager:

The work of librarian is increasing varied as it expands to keep up with the flow of information. Librarian should work with the computer experts to create and manage web sites and intranets for the library. Librarian have to analyze, describe and organize the digital resources such as e-books, scanned images etc for efficient retrieval by the patrons. The Librarian is responsible for managing the information resources, the infrastructure and staff to meet the information needs of the users.

Facilitator/Trainer:

The Librarian also plays the role of information facilitator/ trainer. Their main business is to enhance the information literacy among the users of an organization. In addition to training, other activities (e.g. the development of support tools and services) would be incorporate to help facilitate the ease with which users can access information more efficiently and effectively.

Network Manager:

The library & information professionals must often be network specialists. This include not only the physical networking technology to connect computers, workstations and peripherals with the central institutional computer, with CD-ROM and other physical information serves at the institutional level and also the integration of various

computer technology within an institutional network. It also includes the networking technology for the Internet protocol (TCP-IP) and various other aspects of virtual connections with the world wide network of information sources.

Frontier of Latest Technology:

Information resources from the internet influence the content of the library's collection policy and require inclusion of electronic journals, CAS, documentary delivery and even ephemeral information resources from the Internet. Librarian and information professionals will have to be familiar with key Internet resources and even provide their own content. Library 2.0 has become the buzz world Librarians have to start migrate to become librarian 2.0.

Knowledge Manager:

Identification, Verification, Acquisition, Organization and Dissemination – these are the traditional services provided by the librarians since the emergence of the library services. In the last few years librarian have again had to expand their area of expertise to include digital information, including areas of the World Wide Web. And they are expected to redefine themselves again.. Knowledge is people, content, practice or processes intellectual capital. The librarian will be the idea person to manage the knowledge of the support organization. Librarians can the knowledge manager for training organization who can take the complete responsibility for training content, delivery model and so on. Being the Knowledge Manager means that creating value to the firm by facilitating access to high quality information and by networking people and their ideas together using the technological infrastructure. [6]

COMPETENCY/SKILL FOR THE LIBRARY PROFESSIONAL:

Skill is an ability or proficiency in execution or performance, which is required for a person to plan and execute an action designed to achieve some goals or accomplish a particular task. A skilled person has the ability to perform any task successfully.

Technological Skills:

Technological Skills means those skills which are required to handle information technology and its other related fields such as computer operation, telecommunication media, creation of online database, designing of websites, searching information from internet etc. Technological Skills needed for a library professional can be discussed as follows:

Computer and Information Technological Tools using Skill:

The librarian in the cyber world must have the skill of using computer

and other information technological tools properly. Because quality of the library services is dependent on the quality of the librarian's performance.

Skill of using Internet and Computer Communication Networks:

Skill of handling different computer communication networking architectures and systems i.e. LAN, MAN, and WAN as well as using of Iinternet and other library related networks like INFLIBNET, CALIBNET, DELNET etc are required for a modern library professional working in IT environment to tackle the problems and challenges raised in building and maintaining a digital web-based library. Moreover, the library and information professionals should have the knowledge of network protocols like TCP/IP, UDP, SMTP, HTTP, FTP etc.

Communication Skill:

The library and information professionals act as the mediator between the information users/seeker and the information resources or information providers. Therefore proper communication skill is also important fore the library and information professionals. They should be acquainted with the technical communication writing, as they should have to deal with various groups of people through Fax, Email, Bulletin Board, Web Sites, and Blogs etc.[7]

SIGNIFICANCE OF LIBRARIANS IN DIGITAL ERA:

The new era librarian is a technology application leader who works with other members of the information management team to design and evaluate systems for information access that meet user needs. Where required, the new era digital librarian provide instruction and support so that end users can make optimal use of the information resources available to them The new era Librarian is capable of working in the hybrid world of print and electronic media and providing the best mix of information resources in the most appropriate formats for the environment.

The new era librarian play a key role in developing information policy for the organization ensuring that access to all information resources—from internal records to external databases – is provided in the most strategically- effective and cost – effective manner. The new era digital librarian is knowledge based practitioners who use research as a foundation for their own professional practice and who support the conduct of research through their professional association.

CONCLUSION:

Digital library is the electronic library, which the information is stored in the digital form. With the advancement and new technology in the field

of information librarians need to improve new skill of librarianship information professional and librarians must acquire the new skills are as networking and web based technologies. On live searching of electronic database CD-ROM products e-journals etc. In multidisciplinary knowledge and skills are required if information professionals have to survive.

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Digital Preservation, Metadata and Standardization

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ABSTRACT

The paper after introducing the theme initially discusses the challenges posed due to availability of information tools in various forms like printed micro-digital / optical forms due to changing trends of publishing. The problems in general that libraries face in their efforts to preserve the information for future use. The present paper further discusses two situations specifically regarding preservation of documents received in digital form, metadata and standardization. Metadata provides information about, or documentation of, other data managed within an application or environment. This commonly defines the structure of the primary data. Standardization is the process of establishing a technical standard.

Technical Session VIII
Sub Themes
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E–Learning: In Digital Era

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ABSTRACT

In this paper I discuss about some important point of E – Learning in digital era.
I try to explain what are E – Learning, needs, types, architecture and standards like metadata, communication interface and content packaging. Here Emphasis on E – Learning tools, Web Blog, Social bookmarking. Wiki, RSS, Podcasting etc. Content is a core component of e-learning and includes issues such as pedagogy and learning object re-use. E-Learning provides benefits for the people. Future of E – Learning, Internet opened new possibilities of E-Learning in digital era.

KEY WOWS: E-Learning, E-Learning, needs, types, architecture, standards, tools, content issues, and future of e-learning

INTRODUCTION

Continuing education is important for career advancement, though there are those who seek it for general knowledge as well. Sometimes, however, it's not easy to follow the schedule provide by an institute of higher education. That's where e-Learning comes in for those interested; e- Learning is the practice of going to school, not by entering a building, but by turning on the computer. E-Learning is taking courses via the Internet. The exponential growth of Internet and use of online commotion for E-Learning warrants for equipping every one with new mechanism scuff as computer networks, search engines, multimedia, content portals, electronic libraries and web enabled classrooms. Many teaching programs incorporate the tools and techniques of E-Learning. The E-Learning environment provides he learners with an interactive mode in a successful way. The present paper focuses on some important point of E-Learning.

WHAT IS E-LEARNING

The delivery of a learning, training or education program by electronic means. E-learning involves the use of a computer or electronic device (e.g. a mobile phone) in some way to provide training, educational or learning material. (Derek Stockley 2003)

E-learning can involve a greater variety of equipment than online training or education, for as the name implies, "online" involves using the Internet or an Intranet.

Any learning that utilizes a network (LAN, WAN or Internet) for delivery, interaction, or facilitation. This would include distributed learning, distance learning (other than pure correspondence), CBT delivered over a network, and WBT. Can be synchronous, asynchronous, instructor-led or computer-based or a combination.

As a component of flexible learning, e-learning involves the application of electronic media in the delivery of flexible vocational education and training (VET) programs. It can include the use of web, CD ROM or computer-based learning resources in the classroom, workplace or home, as well as online access to course activities such as group discussions and online assess ment activities.

E-learning (or electronic learning or eLearning) encompasses forms of technology-enhanced learning (TEL) or very specific types of TEL such as online or Web-based learning. Nevertheless, the term does not have a universally accepted definition

The term e-learning is ambiguous to those outside the e-learning industry, and even within its diverse disciplines it has different meanings to different people

NEED OF E-LEARNING

Training is a key of professional skills in today's competitive environment cannot be ignored if you want your employees to develop and help drive the growth of your organization

New values In the old days, professional value and value creation were defined principally through productivity and financial assets. Nowadays a premium is put on intellectual capital. To retain their competitive edge, organizations have started to investigate which training techniques and delivery methods enhance motivation, performance, collaboration, innovation, and a commitment to life-long learning.

New technologies The life of knowledge and human skills today is shorter than ever, mounting the pressure to remain up to date with ones education and training throughout a career. In the age of globalization

and technological revolution, four-year degrees are just the start of a forty-year continuing education. Life-long learning is quickly becoming an imperative in today's world.

Competitive Edge Professional point of view learning as a competitive weapon rather than a bothersome cost factor. Any profession success depends increasingly on top-quality employee performance, which in turn requires top-quality training. Corporate executives now understand that developing employee skills is the key to creating a sustainable competitive lead.

Cost Effective In the run to remain competitive in today's managerial authority, are exploiting advances in technology to train employees rapidly, effectively, and at less expense.

Abundance of information More information has to be delivered in increasingly bigger organizations, testing internal planning, logistics, and distribution. Information worldwide is now in search of more innovative and competent ways to deliver training to their geographically dispersed workforce.

TYPES OF E-LEARNING

There are fundamentally two types of e-learning: synchronous training and asynchronous training.

Synchronous, means "at the same time," involves interaction of participants with an instructor via the Web in real time. Asynchronous, which means "not at the same time," allows the participant to complete the WBT at his own pace, without live interaction with the instructor. A new form of learning known as blended learning is emerging. As the name suggests it is an amalgamation of synchronous and asynchronous learning methods.

Asynchronous Methods Embedded learning Embedded learning is information that is accessible on a self-help basis, 24/7. It can be delivered to the place of work, or to mobile learners. Electronic performance support system (EPSS) is a type of embedded learning. The advantage is that embedded learning offers learners the information they need whenever they need it.

Courses The clear advantage of a self-paced course is convenience. Participants can get the training they need at any time. This can include just-in-time training where a participant gets exactly the training he or she needs to perform a task.

Discussion groups A discussion group is a gathering of conversations that occur over time. They are also called message boards, bulletin boards and discussion forums. Discussion groups can be used to support a group of participants taking the same class or can be used to support

participants performing related tasks. A discussion group is a very competent way to supply expert answers to a large group people. A single answer to a common question can help many.

Synchronous Methods Virtual classroom Virtual classroom duplicates the features of a real classroom online.

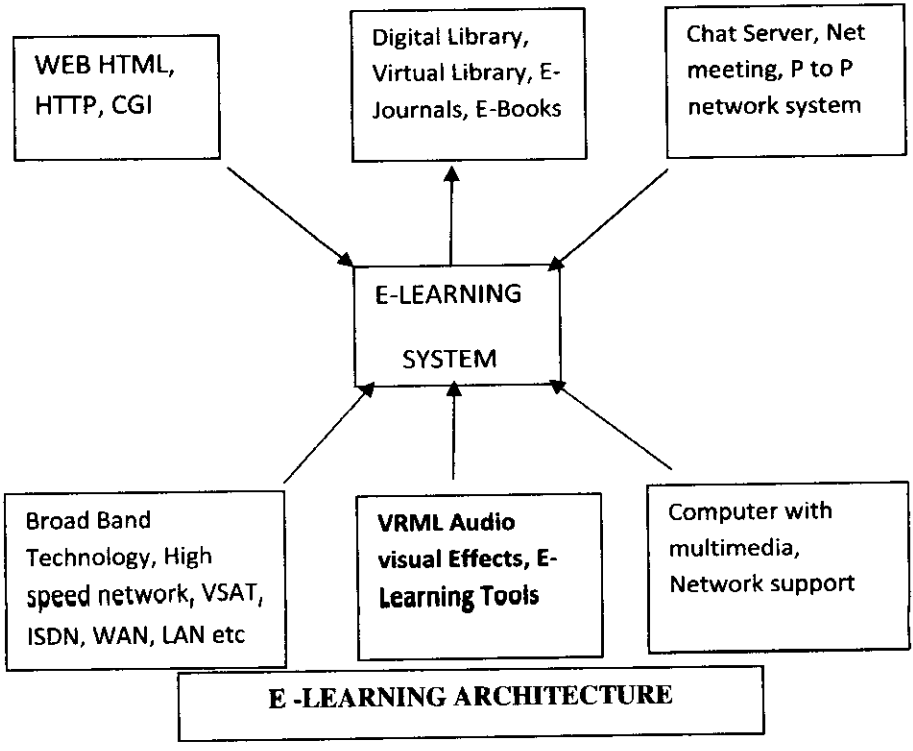
Participants interact with each other and instructors online .instant messaging, chat, audio and video conferencing etc.

Blended Method Most companies prefer to use a mix of both synchronous and asynchronous e-learning methods according to their requirement

ARCHITECTURE OF E-LEARNING
The web is based on three part architecture of e-learning.

HTML – Hyper text markup language the format for web pages provides both formatting and hyper-linking.

HTTP – Hyper text transfer protocol, the protocol to communication between web servers and browers.
CGI – The Common Gateway Interface, the interface for invoking programs from web servers. (5)



E -LEARNING ARCHITECTURE

Based on the architecture of the Internet, the E-Learning architecture can be graphically represented in the above figure

E-LEARNING STANDARDS

What are e-learning standards? E-Learning standards are a set of common rules for content, authoring software and Learning Management Systems (LMSs). These rules or specifications specify how courses can be created and delivered over multiple platforms so that they all operate seamlessly together

Currently, e-learning standards are being developed by four main organizations: AICC, IEEE, IMS, and ADL. A criterion's for Standards? There are main three areas for a standard

- Communication Interface or API—how resources communicate with other systems
- Meta-data—how to describe e-Learning resources in a consistent manner
- Content Packaging—how to gather resources into useful bundles

Communication Interface or API - The communication interface is how learning resources exchange information dynamically. These standards allow different system components to share information about learners across multiple system components. Learner profile information can include personal data, learning plans, learning history, accessibility requirements, certifications and degrees, assessments of knowledge (skills/competencies). In addition, systems need to communicate learner data to the content, such as scores or completion status.

Metadata- Metadata can be thought of as the subjective and objective data that describes the attributes and characteristics of not only content or "data," for which it most is often noted, but also people, places, and things. Learning content and catalog offerings must be labeled in a consistent way to support the indexing, storage, discovery (search), and retrieval of learning objects by multiple tools across multiple repositories.

Content packaging- Industry use of the term "packaging" often refers specifically to gathering and describing the resources for a course. Content packaging specifications and standards enable organizations to transfer courses and content from one LMS to another. This is critical because content can created by one tool, modified by another tool, stored in a repository maintained by one vendor, and used in a delivery environment produced by a different supplier. Content packages include both learning objects and information about how they are to be put together to form larger learning units. They can also specify the rules for delivering content to a learner.

Standards is provide fixed data structures and communication protocols for e-learning objects .This enables interoperability between applications, such as an LMS and third-party or in-house developed content, by providing uniform communication guidelines that can be used throughout the design, development, and delivery of learning objects. LMS standards define LMS and courseware interoperability so that an organization can switch to a different LMS that adheres to the standards with minimal or no impact on courseware. The e-learning industry continues to evolve, change and advance continuously, every day, and common methods and tools necessary to create and maintain content and infrastructure applications is critical, hence the need for standards. Common standards for things such as content metadata, content packaging, API,

interoperability, learner profiles, etc., must be in place and widely accepted for the knowledge economy and the future of learning to realize this vision. Products that adhere to standards will provide consumers with wider product choices and a better chance that the products in which they invest will avoid quick obsolescence.

E-LEARNING TECHNOLOGY

There are manly tows types of technology first are learning management system (LMS) and second are learning content management system (LCMS).

A learning management system (LMS) is software for delivering, tracking and managing training/education. LMSs range from systems for managing training/educational records to software for distributing courses over the Internet and offering features for online collaboration.(7)

A learning content management system (LCMS) is software for authoring, editing and indexing e-learning content (courses, reusable content objects). An LCMS may be solely dedicated to producing and publishing content that is hosted on an LMS, or it can host the content itself (remote AICC content hosting model).

Communication technologies used in e-learning

Virtual classrooms and meetings can often use a mix of communication technologies. In many models, the writing community and the communication channels relate with the E-learning and the M-learning communities. Both the communities provide a general overview of the basic learning models and the activities required for the participants to join the learning sessions across the virtual classroom or even across standard classrooms enabled by technology. Many activities, essential for the learners in these environments, require frequent chat sessions in the form of virtual classrooms and/or blog meetings. Lately context-aware

ubiquitous technology has been providing an innovative way for written and oral communications by using a mobile device with sensors and RFID readers and tags (Liu & Hwang (2009). (8)

E-LEARNING TOOLS

These are the some following tools of used in e-learning procedure.

Web Blog

A blog short for web log is a user-generated website where entries are made in journal style and displayed in a reverse chronological order. The term "blog" is a mingling of the words web and log. Blogs provide comments or news on a particular subject, some function as more personal online diaries. The modern blog evolved from the online diary, where people would keep a running account of their personal lives. Most such writers called themselves diarists, journalists.

Social bookmarking

Social bookmarking is a web-based service to share Internet bookmarks. The Social bookmarking sites are a popular way to store, classify, share and search links through the practice of folksonomies techniques on the Internet.

In a social bookmarking system, users store lists of Internet resources that they find useful. These lists are accessible to the public or a specific network, and other people with similar interests can view the links by category, tags, or even randomly. Some allow for privacy on a per-bookmark basis

Wiki

A wiki is a website that allows visitors to add, remove, edit and change content, without the need for registration. It also allows for linking among any number of pages. This ease of interaction and operation makes a wiki an effective tool for mass collaborative authoring. A wiki enables documents to be written very collaboratively, in a simple markup language using a web browser. A single page in a wiki is referred to as a "wiki page", whiles the entire body of pages, which are usually highly interconnected via hyperlinks, and is "the wiki". A wiki is an uncomplicated, easy-to-use user-maintained database for creating, browsing and searching information. In a wiki pages can be created and updated easily.

RSS

RSS is a web feed formats used to publish frequently updated digital content, such as blogs, news feeds or podcasts, vodcasts etc Users of RSS content use software programs called "feed readers" or

"feed aggregators". The user subscribes to a feed by entering a link to the feed into the reader program. The reader can then check the user's subscribed feeds to see if any of those feeds have new content since the last time it checked and if so, retrieve that content and present it to the user

Podcasting

Podcasting is a fusion of two words: iPod, Apple's popular digital music player, and broadcasting.

Podcasts are basically digital audio programs that can be subscribed to and downloaded by listeners by RSS (Really Simple Syndication). It can be accessed on an array of digital audio devices, like Mp3 players, desktop computer, laptops, mobiles etc. They can be easily produced with any computer having a soundcard; microphone, recording software and an Internet connection. Though podcasters' web sites may also offer direct download or streaming of their content, a podcast is distinguished from other digital media formats by its ability to be downloaded automatically

Instant Messaging

An instant messaging application allows one to communicate with another person over a network in relative privacy. There are many options like Gtalk, Skype, Meetro, ICQ, Yahoo! Messenger, MSN Messenger and AOL for instant messaging. You can add associates to a contact list or buddy list, by entering their email address or messenger ID.

Text chat

Internet Relay Chat (IRC) and other online chat technologies allow users to join chat rooms and communicate with many people at once, publicly. Users may join a pre-existing chat room or create a chat room about any topic. Whether you are in another person's chat room, or one you've created yourself, you are generally free to invite others online to join you. This facilitates both one-to-one communication and many-to-many interaction.

Internet forums

Originally modeled after the real-world paradigm of electronic bulletin boards of the world before Internet was born, internet forums allow users to post a "topic" for others to review. Other users can view the topic and post their own comments in a linear fashion, one after the other. Most forums are public, allowing anybody to sign up at any time. A few are private, gated communities where new members must pay a small fee to join for example the Something Awful Forums.

These e-learning tools are a practical, inexpensive and uncomplicated method for learning online. They are available to one and all and are great for propagating E-Learning

E-LEARNING CONTENT ISSUES

Content is a core component of e-learning and includes issues such as pedagogy and learning object re-use

Pedagogical elements

Pedagogical elements are an attempt to define structures or units of educational material. For example, this could be a lesson, an assignment, a multiple choice question, a quiz, a discussion group or a case study. These units should be format independent, so although it may be in any of the following methods, pedagogical structures would not include a textbook, a web page, a video conference or Podcast.

When beginning to create e-Learning content, the pedagogical approaches need to be evaluated. Simple pedagogical approaches make it easy to create content, but lack flexibility, richness and downstream functionality. On the other hand, complex pedagogical approaches can be difficult to set up and slow to develop, though they have the potential to provide more engaging learning experiences for learner. Somewhere between these extremes is an ideal pedagogy that allows a particular educator to effectively create educational materials while simultaneously providing the most engaging educational experiences for learner.

Pedagogical approaches or perspectives

It is possible to use various pedagogical approaches for eLearning which include:

- **Instructional design** - the traditional pedagogy of instruction which is curriculum focused, and is developed by a centralized educating group or a single teacher.
- **Social-constructivist** - this pedagogy is particularly well afforded by the use of discussion forums, blogs, wiki and on-line collaborative activities. It is a collaborative approach that opens educational content creation to a wider group including the students themselves. The One Laptop Per Child Foundation attempted to use a constructivist approach in its project(9)
- **Laurillard's Conversational Model**is also particularly relevant to eLearning, and Gilly Salmon's Five-Stage Model is a pedagogical approach to the use of discussion boards .(10)
- **Cognitive perspective** focuses on the cognitive processes involved in learning as well as how the brain works. (11)

- **Emotional perspective** focuses on the emotional aspects of learning, like motivation, engagement, fun, etc. (12)
- **Behavioural perspective** focuses on the skills and behavioural outcomes of the learning process. Role-playing and application to on-the-job settings. (13)
- **Contextual perspective** focuses on the environmental and social aspects which can stimulate learning. Interaction with other people, collaborative discovery and the importance of peer support as well as pressure. (14)

Reusability, standards and learning objects

Much effort has been put into the technical reuse of electronically-based teaching materials and in particular creating or re-using *Learning Objects*. These are self contained units that are properly tagged with keywords, or other metadata, and often stored in an XML file format. Creating a course requires putting together a sequence of learning objects. There are proprietary and open, non-commercial and commercial, peer-reviewed repositories of learning objects such as the Merlot repository.

WHY E-LEARNING

E-Learning can provide benefits for the organizations and individuals involved.for example

1. Improved performance: A 12-year meta-analysis of research by the U.S. Department of Education found that higher education students in online learning generally performed better than those in face-to-face courses.
2. 2.Increased access: Instructors of the highest calibre can share their knowledge across borders, allowing students to attend courses across physical, political, and economic boundaries. Recognized experts have the opportunity of making information available internationally, to anyone interested at minimum costs.
3. Convenience and flexibility to learners: in many contexts, eLearning is self-paced and the learning sessions are available 24x7. Learners are not bound to a specific day/time to physically attend classes. They can also pause learning sessions at their convenience. High-end technology is not necessary for all online courses. Basic internet access, audio, and video capabilities are common requirements. (15)
4. To develop the skills and competencies needed in the 21st century, and in particular to ensure that learners have the digital literacy skills required in their discipline, profession or career

Bates (2009) states that a major argument for e-learning is that it enables learners to develop essential skills for knowledge-based workers by embedding the use of information and communications technologies within the curriculum. He also argues that using e-learning in this way has major implications for course design and the assessment of learners.

FUTURE OF E-LEARNING

The Internet opened new possibilities and now any type of learning content, be it for school, graduate or masters level, employee training, research activity or any other type of academic offering. E-Learning

New varieties of e-Learning have emerged with help and push from emerging technologies. Besides distance learning now there is distributed learning. This term describes the educational experiences of individuals and groups that are distributed over geographies and cultures using variety of media delivery methods. This has moved education beyond the classroom to more interactive information by joining learning and experience together. This is developing into learning communities with their own focus on various branches, cultures and sub-cultures. It is a mind boggling explosion of information that is now available with lot of imagination and little effort.

With collaborative tools e-learning is moving into virtual classes and virtual communities where the old methods of practice and test have melted into new interactive teaching-learning methodologies

Future learning is now focusing on learning beyond the classroom and curriculum. Organization need to upgrade employees by offering re-training programmes. These are both costly and time consuming. By designing these programmes and content via e-Learning methods both time and money are saved. The innovative method is also self promoting as it increases the curiosity level of individuals for self promotion and career enhancements

CONCLUSION

Above discussion prove that the E-learning is our need .It's help in development of society for life long living and learning. It is continuing educational process. Many parsons no going school, not by interning building and no achieve formal education. There are so many organization, institution and university in our society that provides E – Learning programs for the people. It is must for development of society because we know that the right to education for all. Right to education mention in many international convection and Indian constitution article 21 A. For this purpose concept of E – Learning is most important tools.
At last I request, in this context our profession and professionals support it. It's our duties to improve and update ourselves

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Empowering LIS Professionals to Meet the Challenges of New Era: An Overview

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ABSTRACT

Effect of the information technology has been seen in every field. Library professionals are the main pillar of any government/private institution. To keep the pace with ongoing changes the staff must be aware of the new technologies. A number of steps have been taken to solve this issue but what actually has been done is the opposite of the reality. The author has tried to analyze the issue and put forth some suggestions to actual empower the staff to meet the challenges of the modern era.

INTRODUCTION

Time has changed each and everything whether it is our power of thinking, our work culture, our organization or our society. Initially, we lived in an agricultural society and by passing through various phases; we have now reached in the knowledge society. The emergence of the new society is a revolution comparable to the deep transformation of the world engendered by the invention of the alphabet and the printing press. A new culture is emerging, based on symbols, codes, models, programmes, formal, languages, algorithms, virtual representations, mental landscapes, which imply the need for new information literacy. Any organization related to any work has been undergoing significant transformation, for nearly three decades. In addition to this, new mode of working has gradually evolved. Technological information is surely involved in redefining a substantial part of organizational operations, in the sense of steadily reshaping the ends (services) and the means (work and managerial process) through which these ends are achieved. The recent trends have been reinforced by the growing instrumental significance of knowledge and information management and combined with wider economic and socio-cultural changes, have challenged the organizational practices and configurations that prevailed in modern society for a century.

The triple crisis at the beginning of the 21st century is closely associated with the simultaneous transformations of speculative thought, the technological base and the structure of production, and with an explosive growth in the generation and utilization of knowledge based on scientific research. As the need for information drives the individual, so also it drives societies. As the brain deteriorates when deprived of information, so a society, if it is to avoid decay, must make constant provision for the acquisition and assimilation of new information, which can be achieved by various means of communication.

"An awareness of what is happening and what is important in a developing knowledge based society, can help information professionals to restructure their institutions, redesign their systems, ameliorate their operations, manage change and reorient their services to needs and conveniences of contemporary and anticipated future customers. Because of globalization, the growing competition and speedy access to vast global information resources, one can witness a spurt in knowledge activities and an enormously accelerating speed in work and action" (Malhan and Wadhera, 2008).

ROLE OF THE LIBRARY PROFESSIONALS:-

With the passage of time, the role of library professionals have changed from an ornamental one to an indispensable wing in public life, in academic world as well as in special, research and business fields. The revolutionary change in document and information, in the method of creating the records and the packaging of ideas constitute the raw material with which library professional deal and changes in this record ultimately change the role which they are performing.

Information poses a new challenge to the library professionals which should be accepted by them so as to benefit the users and enabled them to be well equipped to step into the 21st century. Knowledge workers are living in the frequent changing environment due to:

- knowledge growth
- multidisciplinary work culture
- aware society
- time bound demands and so on....

Library professionals are acting as: information specialist, information officer, efficient manager, teacher/educator, researcher, marketing expert, search intermediary, facilitator, system and network manager, efficient planner, negotiator, team leader, managerial, public relation, custom care, information broker, information analyst, information technology expert, information navigator, translator, interpreter, communicator and content provider. It is now clear that library

professionals, in addition to their normal duties, are performing a number of other roles also so that they can maintain their identity in this knowledge based society.

The world is moving towards the digital environment and the libraries are not untouched with this effect. As digitization of the libraries is in progress, the library professionals have to perform some extra roles in the forthcoming era. Few are as under:

i) Web site builder.
ii) Interface designer.
iii) Efficient evaluator.
iv) User friendly interface.
v) Preservator.
vi) Intellectual accessor.

In order to perform these functions, the library professionals must know about the various operating systems, word processor, data base management systems, networking, web page development, library software packages, digital library tools, information retrieval software, etc. This will help them in a long way to perform their duties more effectively and efficiently. It clearly shows that in the library professionals have to perform a multiracial role with an active spirit in this more demanding era.

NEED OF THE EMPOWERMENT:

The professionals dealing with knowledge must be equipped with specialized skills and should be highly competent. The empowerment of the staff is need of the hour. In order to make the professionals fit for their duties the author has already suggested the use and knowledge of following 4 T's is very helpful (Wadhera, 2007).

Techniques

Teaching Training

Technology

1. ***Teaching***:-

LIPs' have to qualify the MLIS degree as per the eligibility criteria. During their academic course the information about the latest resources, new techniques and technologies, method for KM and their role in the changing era must be teached properly. If the academic status of a person is strong, then he/she is able to manage the knowledge from various resources properly. The curriculum should be regularly revised as per the market needs keeping the basic library science education intact to move forward not leaving the basic principles but with making these principles more firm and strong.

2. ***Training***:-

The younger professionals can get some information about the new resources from their academics but what about the senior ones. They become familiar with the recent developments by means of various training programmes. IT development is the recent one and it stands on computer work, where as most of the senior professionals don't know how to use this technology. This problem can be solved if they are trained with these equipments. Thus, training programmes is essential for all the professionals as the technologies goes on changing and changing.

3. ***Techniques***:-

LIPs' use various techniques to store, access and retrieve the information like acquisition, classification, cataloguing and so on. In the digital era all these processes are also digitized. MARC, OPAC, OCLC and other databases are used to perform the various activities. LIBSYS, CDS/ISIS, LIBSOFT, LOTUS, OASIS, SOUL, TLC-2, New Genlib., etc are used to create the database of an institution and helps in the automation of the institutions. The automated libraries are fulfilling the five laws of library science laid down by Dr. S. R. Ranganathan (Father of Library Science).

1. *Books are for use*: All the available books are easily accessed by the readers and are thus fulfilling this first law.
2. *Every reader his/her book*: Due to automation, everyone gets the copy of the document of his/her desire, thus fulfilling this second law.
3. *Every book its reader*: As the automated libraries make each book available to the readers, this fulfills the third law.
4. *Save the time of the reader*: Automated libraries providing the document or required information to the users in the least possible time fulfill the fourth law.
5. *Library is a growing organism*: Day by day the collection, staff of the library is increasing to meet the changing environment of the society and automation helps the library to keep all attributes in close contact with each other.

4. ***Technology***:-

The various technological tools help LIP's in performing their duties like; internet, intranet and extranet, data mining, data warehousing, AI & expert systems, push and pull technologies, electronic publishing, DBMS and groupware etc. In addition to these a number of KM packages like IBM domino, Hummingbird, Novell Grapevine etc. are available in the market which help the LIP to manage the knowledge properly. In the coming era, the LIP has to perform a multi-dimensional role which is

possible only if they know about all these technologies. Thus, the good academic and timely training is essential for the professionals.

REALITY AND SUGGESTIONS:

Being aware of the fact that the empowerment of the staff at every level is the necessity of the modern times but in reality how much the university/college libraries are working in this issue.

1. ***Automation***

   - Majority of the university libraries have not yet initiated the task of automation and those who have initiated /automated the library functions the situation is less than 50% of the total staff is aware of the automation modules.
   - Some of the University libraries have completed the automation project and rest has completed the task in their central library and the work in departmental libraries of the university yet to be taken off.
   - In case of the college libraries the case is like the island in the ocean. Only few have initiated the automation.
   - The work of digitization is still on the papers only.
   - UGC/State Government must formulate some rules for the digitization/ automation of the university libraries and the universities must adopt some policy for the automation of the college libraries.
   - INFLIBNET is working on the issue and the team should visit the different universities/ college libraries to note the actual growth of the work.

2. ***Refresher Courses /Workshop***

   - UGC helps the universities to organize the Refresher Courses for the empowerment of the staff but again mere number of the participants will attend the course and sometimes due to less participation the programme will either cancelled or postponed. To get the higher grade only, the professionals will attend the Refresher Courses.
   - Time to time various workshops has been organized by different universities/ organizations for the awareness among the staff. But what the percentage of the participants is in these workshops. Near by university/college library professional will participate. The information of the zone remains fixed in a particular area only.

- It should be made necessary that the participation in the refresher courses must be outside the zone of the professional. Like if one is working in the north zone he/she must attend the Refresher Courses outside the zone area and be aware of the things going on other zones.
- In workshops atleast the presentation from every zone must be made compulsory and the wide publicity should be given so that participation from each zone should be made.
- The library professional at any position should be eligible to attend the Refresher courses/workshops to keep themselves up-to-date.

3. ***Conferences***

- Conferences are one of the modes to empower the staff but again how much the participation. Those who contribute the papers they attend the conference either on their own or deputation. But why not the organizing committee sponsors the participation of the staff and why not the university deputes the staff for attending the conference. The professional who attend the conference how much he/she shares the views with others.
- The organizing committee must promote the participation of the staff by providing concession or other facilities like free transportation/ accommodation. More participation will help in empowering the staff from different regions.
- University libraries will depute atleast one of its staff member to attend the conference.
- An interactive session in the respective university will be held on for disseminating the information that he/she will get in the conference. If he/she not perform his duties well a strict action against him must be taken.

4. ***Training Programmes***

- University/College libraries are subscribing a number of e-journals and databases for the benefits of the users. But how much have organizing regular training programmes for those databases to empower the staff.
- Timely training programmes must be organized by the companies and the universities/college libraries to update the staff about the modified version. During the programmes one should clarify his queries if any and get solved as early as possible.

CONCLUSION:-

Empowerment of the staff must be promoted and the suggestions must be refined and formulated as per the requirement. University/College libraries must take initiatives to promote the empowerment programmes. It should be clearly seen that the deputed person must be interested in attending the various empowerment programmes and will provide the maximum benefits to its native institution. University/College libraries must appoint personnel in their libraries who keep himself and others well aware of the various activities going on the state and country and other parts of the world. Librarian must also look that the participation of the university/college must be made in these activities. It can be concluded by the words that not go on paper do some in action.

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Librarian -Faculty Relations: Challenges Encountered in Pursuit of Excellence

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ABSTRACT

The aim of this paper is to highlight the challenges faced by librarians in the academic community. The librarian-teachers relationship plays a vital role in programs like information literacy, development of collection in libraries etc. Although the nature of work and functions of librarian and teachers are interdependent, faculty normally ignores the librarian work which ultimately creates the difference in the two groups. Teachers sees themselves as focusing on the production of knowledge where as librarians as service oriented employees having their duties only for the facilitation of access to knowledge.

Keywords: Academic Community; Librarian-Teacher relation, Collection Development; Collection Management; Information Literacy; Social Status; Library Advisory Committee; Liaison Officer;

INTRODUCTION

In academic community like universities / colleges, wherein excellence in academics are the foremost underlying principle, the main area of academic excellence lies in the area of attainment of a harmonious and close relationship between librarian and teacher/ faculty. This is essentially realized by means of ready availability to library holdings and access to research publications/printed literature etc broadly conforming to the standards of academic pursuits and syllabus.

To achieve the goal of excellence there should be a very important relationship which hitherto was considered a virtual non entity. More precisely put it would be more desirable that there should be cooperation

between librarian and teachers of the college. The term cooperation may be defined as to operate together or jointly towards attainment of common objectives or to a common end or result. In the college, the job of the teacher as well as the librarian is academically oriented but the nature of duties is varied. Even though the sphere of work area seems to be independent, yet their duties are interlinked and intertwined and supportive of each other directly or indirectly towards achievement of common goals in academic excellence.

The following paragraphs explore the existing relation between librarian and faculty.

BENEFITS OF RELATIONSHIP

Any relationship always proves to be fruitful in terms of achieving goals and objectives of an organization. In academic community like college the collaborative work executed jointly by teacher-librarian partnership enhances the academic environment which ultimately benefit the students to excel in academics. This will help in maintaining close interaction between student and librarian/teacher, better understanding of requirements from both the sides, easy access to holdings, prompt action on requirements and disseminating latest knowledge / technology efficiently.

RELATIONSHIP IN ACADEMIC WORK

(a) Information Literacy

In academic institutions like college, the information literacy is very critical aspect for planning and organizing the information resources and support services. This will help in enhancing knowledge among all concerned, keep abreast of latest techniques and remain alert on ongoing developments going on around the globe. The main characteristics of information literacy are as follows:

- Providing access to latest updated progress regarding specified areas of subjects, research publications etc.
- Providing a platform for interaction amongst teachers thereby opening new vistas, doors to a more harmonious working partnership.
- Role in dissemination of knowledge through mode of distance education.
- The Library acts as a platform for teachers to take refuge for academic pursuits.
- The teacher extends its outreach to librarians by giving knowledge in terms of understanding various concepts.

- The Librarians act as a model of active learning centre in terms of community groups.
- The Librarian performs the role of marketing the library services amongst teachers and community at large.
- Procurement of publications from other reputed institute/ university/college etc within shortest span of time.

(b) Collection Development

In college library the collaboration between members, convener and librarian play a vital and off course the key role in order to support the teaching, learning, and research of a particular department. Collaborations among LAC (Library Advisory Committee) in book selection procedure ensure a balanced and appropriate collection.

The book selection should be and is a joint responsibility of a librarian, convener and subject concern teacher, who is a member of library committee. This system enables pooling of resources in a transparent manner and makes the procedure democratic. Booksellers and publishers may show themselves or through their agents all the new titles available to concerned subject teacher in charge. This will help the teacher in examining books physically and evaluating them, if needed.

At first glance it appears to be sound that faculty members know their subject, so book selections should be left strictly in their hands. But practically it is not true in case of book selection. They know very little of book trade. The information regarding new publications seldom reaches them. There is a need for close cooperation between librarian and the teachers in book selection. Most of the librarian's time is spent in informative and administrative duties. But the present tendency of greater control of funds in the hands of the heads of the department deprives the librarian of primary responsibility of maintaining a balance in collection development. Too much dependence on tendencies of single members of the faculty results in imbalanced book collection with some subjects over-developed and some almost neglected if not non existent. The teachers should freely suggest 'title' for purchase, but considering them as final authority will be harmful in the longer run.

While formalizing the evaluation, selection and recommendation in print and electronic resources, the librarian and teacher formed the standing librarian-teacher relationship to address the issues pertaining to it and making it an ongoing process. The committee invariably includes librarian, and other teachers/officers from several academic departments, including administration depatment. The main principle underlying the basic requirements for consideration was that the resources had to directly support teacher/students, meet the needs for research/academic

and ensure that all facilities are made available throughout the academic community. It is also seen that teachers were interested in access to individual specifications only but the committee observed that focus be on those resources with broad demand and fulfill the objectives of the College/Institute. The motive was that this would provide the necessary motivation and instill fresh thoughts/opinions for individual teacher and doctoral/research students to pursue grants and other methods to acquire data or access to other print/electronic resources taking into consideration the research projects which usually combines a couple of departments.

In the prevailing atmosphere, the library normally handles the subscription of electronic resources because there is more availability of expertise in these areas. The Library professionals take the initiative in leadership of the overall evaluation of resources to analyze content, coordination with other electronic resources, and to conduct trials of potential products. While the teacher may be familiar with a particular resource, they are usually not aware of the complete range of resources offered throughout the library system and therefore are less equipped to analyze one resource in relation to other resource existing in a library. As part of the process of evaluation, the college librarians determine the degree of overlap with other resources, especially for particular journal titles, to ensure that duplication of library resources is minimized. As part of its regular routine functions, the library system has workflows and mechanisms in place for the acquisition of print as well as electronic resources, while academic units typically do not adhere to the system. Once it is known that a particular resource is desirable, the procedures for acquiring the product go through the standard library acquisition process and licensing procedures as per rules and regulations prevailing and it includes all print/electronic resources.[1]

According to Gary W.White the partnership also provides a broad and comprehensive overview of the research needs of the teacher members and ensures that the status of current print/electronic resources is known throughout the academic community. The committee members meet regularly to discuss new research needs, discusses the usage and demand of current resources in vogue. While much of the individual teacher requests via e-mail or telephone, but still the requests are sent in written form so as to enable the committee considers it when it meets physically. It also comprehensively examines the progress of work orders and review major recommendations and decisions. In this context, both i.e. librarians and teacher are able to identify long range goals and can incorporate collection development resources into respective strategic plans.

CHALLEGES IN ADMINISTRATIVE AREAS

(a) Library Advisory Committee

In college/Institutes the Library Advisory Committee is a platform of process sharing, wherein faculty-librarian relationship progress and produced result accordingly as per the existing relationship. The Library committee is a major standing committee. In the most of the colleges it is recommending or advisory committee and is formulated by the staff council of the college.

As per guidelines of ordinance most of the college library has a provision of Library Advisory Committee and one convener of library committee is appointed by staff council for a budget year. The librarian is also a member of staff council, so he can also become the convener of library committee but maximum times it is from a faculty member. The size of the committee is fairly large due to representation of teacher in-charge/nominees from various departments. But the irony of the fact is that, responsibility, liability, accountability and answerable body is the librarian but decisions lies in hands of other faculty members in the committee due to its overwhelming majority in the committee. To avoid such unpleasant circumstances, it is recommended that a liaison person should be present to coordinate between librarian and teachers. In such situation convener role as liaison person between faculty-librarian loop and relationship between them play a vital role or seems to be the only single tool, which support library committee to work in a productive approach manner and benefits for the library liaising activities.

(b) Library Administration

General activities in any library includes the routine jobs like

- Procurement and placement of orders towards supply of books / journals publications etc.
- Disposal of unwanted material (raddi).
- Stock Verification of library holdings.
- Allocation and streamlining library staff duties and responsibilities to ensure prompt service to members.
- Safety and Security of library.
- Creation of congenial atmosphere for study.

All these activities must include the whole of the teaching staff and the librarian working together and informed of each other's activities. The teacher should actively engage their students in using the library as a kind of device of learning "how to educate themselves" The library must be taken as an extension of the class-room and students are expected to

use it intelligently in preparation for discussion in class, seminars, reports and papers. But for this kind of teaching, there must be two-way flow of information between the teachers and the librarian.

For their part the teachers should know the library's resource and adopt his teaching so that the student has the chance to use them in pursuing the subject matter of the course. They should consult with and give effective direction to the student for making use of library and make assignments essential for library investigation they should also make library consultation vital and interesting to the students. The librarian should be invited in meetings of the class to discuss general reference books and bibliographies and the available resources. It should be appreciated to consult the librarian for the availability of special materials. The teaching methods should create urge in students to seek the assistance of the librarian is learning more about special resources and aids pertinent to their studies as they process with their research. The faculty must arrange a special seminar/class every week where it is necessary to use library books and resources in connection with class discussion.

The role of librarian is to help students learn when they are away from their teachers by providing a learning environment. The idea is to establish conditions conducive to learning and to maximize the utilization of materials. The Librarian should be personally acquainted with teaching colleagues and know as much as possible about their characteristic methods of teaching. He/she must be familiar with the curriculum and keep informed about current changes to update his materials. The library should remind teachers of the varied opportunities for using library resource in teaching. The librarian should know what tools and materials the instructor is using so that students are not only given assistance in using them properly but encouraged to learn the other available tools. He/she should bring new materials and library services to the attention of the teachers and acquaints teachers with unique and unusual materials available in the library's special collections that might profitably be used by the students. In addition to all these the librarian can also device different methods to bring documents, students and the academics together under environments which stimulate reading for pleasure, self realization, personal growth and development, and the cultivation of intellectual excellence. In formulating library rules and regulations the help and opinion of the faculty must be taken in to consideration.[2]

SOCIAL ENVIRONMENT: *Librarian and Teachers*

It has been observed that there is a dichotomy in understanding of the roles between the librarian and the teachers. There is a perceived lack of

understanding amongst the teacher regarding the varied role of the librarians. In the mindset prevailing in the teachers, the college librarians do not play a role in teaching, academics or research. In case of teaching, the teachers perceive that their respective classes and students are their own domain and are to be considered out of bounds by other teachers. In such a situation, the college librarians do not stand a remote chance to interact with the students let alone teach them. In sphere of research, the teachers considers the college librarians as a resource person only i.e. gaining access to materials as deemed necessary for the advancement of their research, not as experts who could play a vital role in the dissemination and execution of a research project. What seems to have emerged between the two sides i.e. teacher and librarian, is a double-sided knowledge literacy gap. On the one hand, teachers do not view or consider the college librarians as having specific expertise in the teacher's discipline to discern the appropriate resources for a particular course or research project; on the other hand, librarians view teachers as relatively illiterate and incoherent, vague on matters of information technology, search techniques, and so forth. There is a grudging mutual respect between the two groups in terms of technical expertise, but only in their respective fields and should not overlap in each other's territory.

Although college librarians and teachers are interdependent and connected in a loosely coupled unique way, the teacher views the separation between the two groups in terms of the different organizational principles and functions thus drawing a line between the two groups. The teachers view that the two groups are two different entities and are assigned two different roles, and therefore it is justified that they have little contact between them. But there is more to this disconnection than just a simple organizational principle involved. The strong perception among teachers is that college librarians' work is service-oriented and their primary duties and responsibilities are the organization and facilitation of access to knowledge and other resources. On the other hand, regarding their own role, teacher views their work as focusing on the creating, initiation, production and dissemination of knowledge. The teacher's view of educated blatant ignorance of college librarian's work reinforces the status differences between the two groups.

This aspect of teacher's ignorance of librarian's work leads to the viewing of the status of librarians differently by teachers, both as an individual as well as a group. Among these are firstly, the formal-institutional status of librarians and teachers is perceived as a monolith which cannot be changed, Secondly the librarians labeled as "support staff" with the status as comparable to technical staff existing while the faculty are labeled as "Faculty" equivalent to demi-gods. Thirdly, the knowledge contained within the confines of the area concerned seats of

operation are separate and disparate while in reality, both the groups are interrelated and interconnected. These differences have long been a source of division between teachers and other college bodies like librarians, information technology workers, etc.

The definition of services and professions has always held different social statuses. The words became active and highlighted in the modern era. The work of teacher has traditionally been considered professional not as a service, whereas the attainment of professional status among librarians has been a historical and traditional process that has emerged over time, but not without resistance. Librarians have worked hard at getting others to understand that their work as professional. During our experiences and observations, the teachers did not share the historical view nor appreciated the position. But at the same time, they believed that librarians are experts and are professionals but were only for providing services to them. However teachers have grudgingly expressed genuine respect for the work of librarians and it appears that librarians have succeeded in defining their work as expert-professionals in the eyes of teachers.[3]

While in many educational colleges /institutes librarians are classified as non-vocational academic staff, but still in some colleges /institutes, they are classified as non teaching and governed by non teaching rules and regulations at present. They are neither included in teachers nor are given status equivalent to the teachers. Even though, they are on equal footing with teachers. This anomaly has resulted in changing the perspective of teachers at various places. In our opinion, this would affect the profession which results in the following:

- Non consideration of academic excellence leading to downsizing of importance of librarians.
- Air of superiority amongst teachers leading to virtual non cooperation in area of academic field.
- No interaction with librarian and also among teachers leading to a stagnation in academic dissemination to students, research scholars etc
- Academic standards fall down.
- No interest in maintaining the harmonious relation between librarian and teachers.
- Overbearing presence of ego amongst various teachers.
- Lack of faith, confidence and fear of exposure among teachers leading to virtual breakdown of providing services.

- Due to increased availability of web, decreased interest being shown by teachers to increase the variety of holdings pertaining to progress in print.
- Teachers / faculty is no longer interested to come to library to exchange information regarding various subject areas.

HURDLES IN RELATIONSHIP

The difference in social status between teacher-librarian relationship is not only due to different school of thoughts but also due to lack of proper direction from the top management, lack of transparency and honesty, vitiated situational circumstances, strong presence of ego, absence of humbleness and selfless interest, no interaction between teachers and librarian, self centric and isolated teachers, no faith and trust between librarians and teacher, sense of superiority amongst teacher. The teacher forgets that library is service oriented department and would work as per objectives only if it is regularly used by people concerned i.e. teacher/students.

INTIATION OF POSITIVE MEASURES

The library should pay special attention to publication of teachers and help them to create institutional repository of articles written by teachers in journals, news paper, display bibliographical details of teacher's publications on library notice board, and allocate some fund for purchase of books written by teachers. Library should make arrangements for the procurements of those periodicals or magazines, which are not subscribed by the library but articles of the teachers being published in those periodicals. In addition to these, library should do the following for building good relationship with the faculty.

- Compile a bibliographic details of those books recommended by the teachers and those books must be kept at reading section
- Library should inform to teachers whenever his/her recommended books arrived in the library and is ready for circulation.
- Deal all teachers with respect and should be polite at all service points.
- Librarian should utilize the experience and expertise of teachers and integrates into maximum library service programs.
- Use information technology applications to promote and cooperate in teaching, learning and even for some individual needs.

- Provide and promote available information and resources on concern subject of teachers not only in the library but also outside the library such as in class-room, via telephone, email etc.
- Librarian should provide some service personally, so that he/she able to keep contact continuously with teachers.
- Library should provide separate reading space with some basic infrastructure and facilities, so that teachers may spent time in the library.
- Librarian should actively participate in other college activities such as sports committee, extra curricular activities etc
- Avoid saying 'it is lunch time or tea break', teachers must be aware of these facts but due to some necessary or urgency they may come to librarian room and asks for help in relevant areas.

Time to time, the librarian should go out of the library and meet teachers on their own domain/room for better interaction in a cordial atmosphere.

CONCLUSION

Partnership between librarians and teachers in an academic community is a relative new trend in India. The experiences are varied and at the same time are not well assessed and documented. Teachers and librarians normally have the usual relationship of user-information provider. Although, librarians have assumed the role of educators in information service, their work tends to unrecognized. Partenership is needed so that librarians/libraries can become effective part of the learning process for all.

In a large organization setup, where budget and staff is not a problem, the liaison officer or librarian work as a catalyst for liaison activities between library and teachers. In college library, librarian is not assigned for liaison activities due to lack of professional staff and budget constraint. The library advisory committee and the convener of the committee play a very vital role in liaison activities between teachers and library. The most important aspect of convener is liaisoning in the development and nurturing of a cooperative relationship between the librarian and teachers for all library activities. In college library liaison work means cooperation, collaboration, and partnership between teachers and librarian in order to enhance teaching, learning, using library resources and services.

An important binding aspect to this partnership is the understanding that both the college administration with teachers in particular, and the libraries are interested to share the same outcome, that researchers have

access to the resources they need to support their research. This partnership has residual beneficial effects for the libraries. The relationship has established a far greater working relationship between the college and the libraries than existed before. Both are more aware of each other's mission and goals and are now working cooperatively and constructively to meet these objectives in a realistic phased manner. Library personnel are working closely and interactively with teachers and are gradually being aware of current research projects and needs. College teachers are being made to understand and broadly aware of library resources and services and are also more aware of the research interests of other teachers in different academic departments and locations. As Gary W.White says that the partnership has allowed the library to be an active partner in the operations of the college and the librarians to be much more proactive liaisons than before. Overall, the library and the college have a much stronger working relationship as a result of this partnership. The partnership is a mixture of vibrance and balanced viewpoints existing in a seamlessly delicately woven strands of a rather invisble thread of relationship. This relationship should be nutured and should be developed into a true strong bond enough to withstand any type of discordant noises and pulls and pressures.

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Library & Information Science in the Digital Era

Sub Theme: Changing Role of Library and Information Professionals

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ABSTRACT

This paper is about growth of technology in the field of library and information science and its impact on the role of the library and information professional. Here we talk about use of new technology in digital library. Capacity building in library and information centre with the help of new technology like microforms.

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Library Science Education in Practice: Some Reliable Teaching Resources for All Times

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ABSTRACT

University faculty has to deal with adult students who are aware and alert and will not easily tolerate shoddy work on the part of their teachers. A teacher in the University is expected to be well versed, well prepared and up-to-date with his subject. This is all the more so in Library and Information Science which is a dynamic cocktail of disciplines that is ever growing. In this digital age, a faculty member in Library Science education needs to access and use the best resources, both old and new in order to remain relevant. This paper presents the personal experience of the writer with a variety of resources that have come in handy both in personal research and classroom lectures.

Keywords: Library Science Education, Teacher, Teaching Resources, Books, Journals, Internet,

INTRODUCTION

Teaching is teaching, the topic being taught notwithstanding. Every teacher, no matter what discipline he is involved in, will rely and fall back on certain techniques and resources in order to deliver the goods well in the classroom. Over years of experience and through a system of trial and error, knowledge is accumulated, filtered and disseminated by the teacher to the student. There is job satisfaction when one uses his God given teaching gift coupled with years of research and preparation. This, in turn, is reflected in the enjoyment, enthusiasm and good grades shown by one's students. This is all the more apparent in the University set –up where the students are adults who are aware of their teachers' capacity and cannot be taken for a ride. Of course a profession is made up of all types of people. There are those who are complacent and see no reason to update their knowledge. They are happy to recycle the knowledge their teachers handed down to them generations ago, without expanding on it themselves. Sadly this is rampant in India where the system of performance evaluation and tenure are not yet properly carried

out as in the West. This is all the more rampant in the North East of India where students are pretty docile and will excuse their teachers' shenanigans and incompetence without protests.

The real teachers as mentioned earlier are those who are gifted for the profession and for whom teaching are a lifelong learning experience. They genuinely love teaching and research and they love their students. And they will go that extra mile in their dedication to the profession. This includes finding and using good information resources to impart to their students.

LIBRARY AND INFORMATION SCIENCE EDUCATION

Library and Information Science education presents an even more challenging scenario being as it is a cocktail of disciplines. A teacher in this discipline has to be dynamic or be relegated into oblivion. A dedicated teacher in this discipline recognizes that he has to read research and network widely in order to stay relevant. Because "the library is a growing organism," we educators have to keep up with that growth. While the core topics like classification, cataloguing and library administration/management need to be on our fingertips so to speak, we are also having to educate ourselves and our students on a wide range of areas including many aspects of information technology, the Internet, new methods of management and what have you. Every aspect of the curriculum undergoes change rapidly and the Library Science syllabus has to be updated more regularly than those of other disciplines. While entirely new topics such as Information Technology and Library Software Packages have been incorporated into the syllabus, even the core topics like classification and cataloguing, reference service and library management have to adapt too many new changes. The Library Science teacher is thus in a challenging and dynamic position.

Library and Information Science Education in North Eastern Hill University

The Department of Library and Information Science, North Eastern Hill University (NEHU), Shillong has embraced new trends in its curriculum since its inception in 1986, without discarding the core traditional aspects that continue to be relevant. Practical experience in library housekeeping activities is emphasized upon and over the years, intensive computer practical knowledge (in the department laboratory) has been added to this in order to equip the students for working in automated libraries.

Broadly speaking, the following topics are taught in this Department (not in the order given in the syllabus)

i. Foundations of Library Science

ii. Organization of Knowledge (Classification & Cataloguing, Theory and Practicals)
iii. Information Technology (Theory and Practicals)
iv. Library Software Packages (Theory and Practicals)
v. Reference Service
vi. Information Retrieval
vii. Research Methodology
viii. System Analysis
ix. Statistics
x. Environment Issues and Sources
xi. User Studies
xii. Library Housekeeping Operations (Theory and Practicals)
xiii. Collection Development
xiv. Management of Library and Information Systems
xv. Database Management Systems
xvi. Information Communication Technology

TEACHING THE PAPERS

In this article, I describe my experience with the papers I have been teaching in the Department over the last thirteen years of service here. More specifically, I highlight the information sources that have been my partners and that have served me and my students well all through these years.

Due to shortage of Faculty there was some kind of rotation of papers amongst the existing Faculty members in those initial years. Thus a Faculty member was expected to be a Jack of All Trades and was Master of None. It is only in the recent years that Faculty members are allotted their own papers and teach only the papers they have been allotted. However, even now, the Faculty members have to be ready to teach a different or extra paper if the need arises.

Due to the above situation, I too have had experience with teaching topics like Fundamentals of Computers, Library Management, Collection Development and Cataloguing even if only for one or two semesters. But the topics I have finally settled down with (for now at least) are Reference Service, User Studies, Environment Issues and Library Housekeeping Operations distributed through three semesters of the course.

The official or formal nomenclature of the above topics in the syllabus are:

Paper 104 – Information Sources and Services (i.e. Reference Service, including one unit on Environmental issues, sources, organizations and institutions)
Paper 205 – Library Housekeeping (including practical work in the NEHU Central Library and a Job Diary)
Paper 403---- - Information Users and Their Needs (i.e. User Studies)

RELIABLE RESOURCES

While my teachers had taught me well and I continue to refer to the notes I took down during my student days, as a teacher I have also put in effort to expand and update my existing knowledge. Over the span of thirteen years and through a system of trial and error, I am now able, to a certain extent, to identify some reliable sources of information that have not failed me so far. Following is a brief description of my experiences with these sources:

The " Fundamental Classics" -

While quite a few teachers (across disciplines and worldwide) have abandoned print sources altogether and become obsessed with the Internet, depending entirely on it for information (as a result of which they sometimes present incorrect and unreliable information), I am still a firm believer in the 'fundamental classics." These are of course the "old old" books (some may have been digitized) that provide the background of a topic, (any topic in any discipline) – the historical background, the founders, propounders, the definitions, the principles, the components and so on. These are the foundation of the subject and it would be foolish to wish them away or turn our noses up on them. In any case, most new print and web sources can't help but refer to these old classics. From personal experience, I have found the following classics very reliable, relevant and useful.

i. **Encyclopedia of Library and Information Science** – Of course there are quite a few versions of this but the one published by Marcel Dekker Inc. is the one I refer to every year and which I ask my students to refer to also. It is revised from time to time and has authoritative articles written by experts from all over the world. Being an multi-volumed encyclopedia, arranged alphabetically, it is an easy and interesting read
ii. **Librarians' Glossary and Reference Book (Harrod's)** – While I do use all kinds of dictionaries (and the NEHU Central Library is well equipped with all kinds), this Glossary is my constant companion. I refer to it almost on a daily basis. This is another classic containing the most authentic definitions, not to speak of the abbreviations and acronyms.

iii. **Annual Review of Information Science and Technology (ARIST)** – As far as reviews go, this is one of the best in the field of Library and Information Science. It is a book I consult regularly, particularly for User Studies, the articles for which usually appear in the first chapter of the Review.

iv. **Books by S.R. Ranganathan** – He is not known as "The Father of Indian Library Science" for nothing, for his works are innovative, solid and foundational and continue to remain relevant to this day. While his language may be a little difficult for many people (especially students) to grasp, yet his are the books that can be trusted for years to come. For my teaching purposes, I have found his Library Manual, Reference Service, Library Book Selection, Library Manual for School, College and Public Libraries and Five Laws of Library Science very authoritative and helpful. The Five Laws are like onions and potatoes since they are applicable in every aspect of the curriculum. In the papers I have been teaching too I have applied them in one way or the other. For example, to explain how Reference Service fulfils any one of the Laws. The bottom line is that you cannot ignore Ranganathan if you want to teach well.

v. **Books by Denis J. Grogan** – I was first introduced to his work (Science and Technology : The Literature) by my teacher Professor J.C. Binwal in my student days. A book written in simple and interesting language sprinkled with plenty of humour. I continue to consult this book for his interesting description of different information sources. And over the years I have discovered, used and referred my students to many other Grogan classics such as Case Studies in Reference Work and Practical Reference Work.

OTHER CLASSIC AUTHORS

Reference Service

William Katz – How can one talk of Reference Service and not mention William Katz. His white multi-volumed "**Introduction to Reference Work**," has been and continues to be much loved and used by Library Science students over the years. Not only does it describe reference work but also individual reference sources in detail.

User Studies

While **Tom Wilson, Brenda Dervin** and their ilk rule the roost in this area, it must be said that their style of writing is not the easiest to grasp. Rather it is **Maurice B. Line** who has made the subject easier to understand and even fun. Like Grogan, he too simplifies the subject and sprinkles his writings with great humour. His report on the humongous INFROSS is so much fun to read precisely for this easy style of writing.

For example, in his self deprecating style, he explains the reason for the poor response to the study as being the terror that the respondents felt at the sight of the extremely long questionnaire – he concluded that the respondents either died or changed their address just to avoid answering the questionnaire.

For **User Education**, books by **Nancy Fjallbrant and Ian Malley** can always be relied upon for basic understanding of the topic at hand even though many new books describing newer methods of User Education have emerged.

Most books on Reference Service can also be consulted for User studies as the two topics are intertwined and one cannot be taught without mentioning the other.

Though the Library Housekeeping paper is almost entirely a practical paper where the students are required to work in the NEHU Central Library two hours for three days of the week, yet there are also theoretical aspects of the paper which involve describing the workings of different sections of the Library. For this, books on general Library Administration or Library Management are useful. Besides these, there are also books describing individual library services such as Technical Processing, Circulation, Collection Development etc. which also come in handy.

NEW BOOKS

While the classics are indispensible (at least to me), one cannot cope without consulting the latest literature in the field and they are literally exploding into the atmosphere these days. Some exist only as 'noise' to fulfill the 'publish or perish' syndrome that is so prevalent in academia. They are nothing but 'cut and paste' products and could even be unreliable in some cases. However, there are really excellent new books that are coming out in every aspect of our discipline and in the topics that I am teaching, I have found **Tim Owen** (Success at the Enquiry Desk), **Bill Katz,** (Digital Reference Services) **and David Nicholas** (Accessing Information Needs :Tools, Techniques and Concepts for the Internet Age) to be always handy.

JOURNALS

There is a wide variety of Journals available in the field and I have been personally benefitted from the use of these, both in their print as well as their digitized format. While a few like *Library Hi-Tech* are specific to their respective topics and those like Library Trends are thematic, there are those that carry articles on a variety of topics in every issue.

For all the papers I am teaching, as well as for my personal research activities, I have found *Journal of Documentation, Aslib Proceedings, JASIS, College and Research Libraries, Journal of Education for Library and Information Science, Journal of Academic Librarianship and Library Administration and Management* to always have something useful. Amongst Indian journals, *IASLIC Bulletin, Herald of Library Science, SRELS, ILA Bulletin* and *Library Herald* are the ones I consult and use on a regular basis.

INTERNET RESOURCES

As mentioned earlier, a teacher of Library and Information Science cannot but keep up with changing trends and use of the Internet is thus unavoidable. But I am one of those who are cautious about the Internet and will not lap up everything it throws at me. Research has shown that the first ten hits are not always the best. People can easily buy their place into the first page of a website. **Google** is good but it is not the only search engine. Yes, in Google there are also **Google Scholar** and **Google Books** which sometimes present more scholarly material. Some researchers swear by the **Deep Web** with websites like **Incy Wincy etc.** but I have personally found Google better than these. **Success of course depends on effective searching techniques**.

For my own teaching purposes, while I do start with Google most of the time, and yes I have been able to download and print many scholarly articles, sometimes it has failed me. The **UGC-INFONET Consortia** that the NEHU Central Library is a member of has been quite frustrating for quite a few people including me, since it is not as easy as Google to navigate and has led to long winding searches and many dead ends.

For emergencies, the **'define:'** facility of Google has come in handy for definitions quite a few times. So also the **Online Dictionary of Library and Information Science (ODLIS)**. **Project Gutenberg** and the **Internet Public Library (IPL)** also provide all kinds of reference sources such as encyclopedias and dictionaries (by subject and language) for quick consultation.

For User Studies and Reference Service, apart from going through Google for scholarly articles, there are also the **personal websites** of people like Tom Wilson, Brenda Dervin which contain descriptions of their theories apart from providing tidbits about their personal life.

It is for my portion on Environment that I consult the Internet the most. Many reliable scholarly articles on different environment issues such as **Global Warming**, the **Chipko Movement**, etc. are available. Besides,

the websites of most Environment Organizations, Institutions and Associations present more authentic and updated information than books. My students and I regularly consult the websites of organizations and institutions such as **Greenpeace, PETA, World Wide Fund, UNEP, TERI, NEERI, ENVIS** etc.

Wikipedia? – Of course anyone who has used the Internet even twice will know that Wikipedia is usually amongst the first ten hits on any website. But only a fool would trust this encyclopedia blindly. It is a source that can be edited and updated by anyone and thus not totally reliable. While it does serve a purpose especially for emergencies but one should rather use it cautiously or avoid it altogether if better sources are available. The better option is to scroll down to the list of references (books, articles, websites) from which the wiki has taken its information and click on those instead. The Wikipedia is at best a means to an end and cannot be used as an end in itself.

READING WIDELY

It helps to be a voracious reader, not only of sources in the field but also of a wide variety of fields. The range of topics can swing from the scholarly to fiction. My interests stretch from the topics that I teach to those that my colleagues teach – particularly Information Technology (because it impacts all aspects of Librarianship including Reference Service and Information Seeking Behaviour), Library Management (which actually covers the theoretical aspects of the Library Housekeeping paper – for eg. management of different sections of the library, and aspects on leadership are applicable to the study of the Reference Librarian), Research Methodology (it covers data collection tools like questionnaires, interview and observation which are applicable to User Studies).

Then there are the **newsmagazine** like **India Today, Outlook, Time** and **Newsweek**, the **glossies** like **Femina, People** and **Good Housekeeping**, the **novels** by **R.K.Narayan**, the **Christian Literature** (books on relationships, peer pressure, leadership, self esteem etc.) which somehow or the other become useful in my classroom lectures. That is not to say that I gossip about celebrities with my students but once in a while, I am somehow able to input information from these sources in the context of my papers. And the success is evident in the lively interactions that the students participate in with me.

THE MEDIA

Television, newspapers and the **radio** also have their purposes. Library Science being a dynamic cocktail of disciplines, as mentioned earlier, does lend itself to influences from the media. Information garnered from

the local, national and regional **news channels**, the **entertainment channels** like **Star World** and **Zee Café** and especially the **lifestyle channels** like **Discovery Travel and Living, National Geographic, Discovery** and even **Animal Planet** somehow or the other find mention in my lectures. For example, in describing the activities of Greenpeace, I was able to describe the sinking of its ship, The Rainbow Warrior, based on a programme I had watched on the Discovery Travel and Living channel. And this is just one example of the uses of the media in my classroom lectures. News on environmental issues keep popping up in the media and these are brought to the classroom and discussed with enthusiasm.

CONCLUSION

There is no winning formula for teaching and no perfect teacher. To each his own. It would be pompous and very foolish of me to conclude that the resources and techniques I am using are enough. On the other hand it is healthy to share one's experiences, particularly with peers. While the above are not the only resources I am using, yet they are the ones I rely on and would like to recommend to other people in the field if they are not already using them.

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LIS Education, Training and Research in Nepal

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Nepal, being the hub of sages (*Rishi and Muni*) in ancient period, has been getting popularity in *gurukul* education. Vedas are believed to be the most ancient and oldest documents. Vedas are supposed to be the sacred and holy documents compiled to transfer the Hindu Gods' speeches which are preached by Balmiki who is known as Ved Byas. The real name of Veda Byasa was *Krishna Dwaipayana*. It is believed that he had preached Mahabharata and God Ganesha wrote that accordingly. Ved Byas was born in Bharat now India and also had his *Ashram* (residence) in Tanahu District—the hilly region in mid-Nepal. Siddhartha Gautam popularly known as God Gautam Buddha 563 BC did a lot in transferring education. Balmiki (400 BC), being real name *Ratnakar* wrote Ramayana of 24000 verses. His ashram (residence) is popularly known as Balmiki Ashram in Southern part in Nepal—which is still preserved. These few examples are sufficient to provide evidence of many ancient libraries, *gurukuls*, and education practices in Nepal since ancient ages. Now in Nepal 5 Universities have their central and constituent libraries. Educational institutions, companies, organizations, service institutions government offices etc have maintained their libraries. However excluding the libraries of many service providers, specialized groups, etc we project, we have around 1200-1400 Libraries, 6 active institutions for LIS training, 20 active institutions for LIS advocacy and activities, 3 levels of LIS education and one university to impart LIS course.

SHORT HISTORY OF LIBRARIES IN NEPAL

The history of libraries in Nepal can be traced as far back as 1500 years ago, when Sunaya Shri Mishra came from Kapilbastu to the city of Lalitpur. He created six Vihars (monasteries) where scholars and students wrote their Buddhist and scientific scriptures, banners, tapestries and painted scrolls. These were and are still displayed to the public in the month of Sravan. Even before this time, there were Viharas in Nepal, where people used to see and study manuscripts. In the Vikramashila Mahabihara (or Thabahil) of Kathmandu , there is an ancient manuscript written in gold- a very thick book—consisting of one lakh (100000) verses in four volumes. It is entitled Lakshabhagabati or Pragyaparamita.

In this way manuscripts were kept in Vihars, Guthis, Temples. Thus there were the Vihars, and temple library system in ancient Nepal. Some other form of keeping and using libraries, old manuscripts are seasonal telling of Swosthanis (story of Lord Shiva) in the month of Magh and Jatakabadhan and Swayambhu Puran (historical stories of Nepal) etc in the month of Shravan. Then we come to the libraries of Malla Kings—more than six hundred years ago. The then king and unifier of Nepal King Prithivi Narayan also unified various libraries and centralized them in his palace –Hanuman Dhoka Durbar in late 1760s and early 1770s.

Girban Yuddha Bira Bikram Shaha Deva, the then King of Nepal in 1812 ordered a priest, Mr. Kedar Nath Jha to care for the library materials passing a rule (act) on library. He was charged with responsibilities with salary and other facilities. However Mr. Jha was not a professional librarian.

LIS EDUCATION IN NEPAL

First generation

The first professional librarian of Nepal was Mr. Purna Prasad Amatya. He graduated in LIS from Delhi University, India in 1952. Another successful professional librarian was Mrs. Shanti Mishra (Shrestha). She got masters degree from USA in 1963 and continued to work in Tribhuvan University Central Library as the chief librarian. Later since 1975 Tribhuvan University sent some of its staff and teachers to be educated in LIS in India. Madhusudhan Karki and Mohan Raj Pradhan are the only 2 persons who received Doctor of Philosophy (PhD) in LIS from Nepal to date. From India more than 85 persons passed B. Lib and 25 persons M. Lib. and 2 persons received Doctor of Philosophy (PhD) in LIS in Nepal.

Second generation

Tribhuvan University established Library Science Department in 1995 to impart B. Lib course. Later it stopped one year B. Lib course and started 2 year MLIS course in 2002. From this department 116 and 55 students have passed B. Lib and MLIS respectively.

Now Tribhuvan University (TU) has passed course for 3 years Bachelors and Higher Secondary Education Board has also passed LIS course for 11 and 12 classes. Students can major LIS in 11, 12 and Bachelors degree in TU.

LIBRARY TRAINING:

Professional librarians are very few. If all the libraries and institutions start to hire at least LIS trained person, all the professional librarians should start to teach to produce para professionals. In other words the

majority of library staff is non LIS professionals and even non para-professionals.

Considering the need of better LIS service delivery, LIS trainings are being conducted since long ago. Many organizations hire professional to train their staff in their own institution. Many governmental, non governmental organizations demand and request have led us to impart LIS training. In Nepal the training institutions should take affiliation from CTEVT (Centre for Technical Education and Vocational Training). Some of the professional organizations can also organize the specialized training. So Nepal National Library, Tribhuvan University Central Library--TUCL, Central Department of LIS—TU, TULSSAA, LIMISEC, are providing training. As well as NASL, CLID Nepal, Room To Read, READ Nepal, CDS/ISIS Society, Health Net Nepal, etc are imparting specialized package of LIS training. The human resource is shown below in table.

Degrees/ from Countries	B. Lib	M LIS	PhD	LIS III level training	II &I level and below (simply trained)	Total
Nepal	116	55		1150+	3000+	4021+
India	85	25	2			112
USA, UK, Philippines ...		4 (1,2,1 respectively)				4
Total	201	84	2	1150+	3000+	4137

LIS ASSOCIATIONS AND INSTITUTIONS

Nepal Library Association was started in 1955 but due to its passive nature it was vanished. Later in 1979 Nepal Library Association (NLA) was reestablished. NASL-Nepalese Association of School Librarians was established in 1995. TULSSAA is another professional association established in 1999. NCLA-Nepal Community Library Association was established in 2005 under READ Nepal. LISSA-Library and Information Science Students' Association is a team of (young) LIS learners in university.

REFSALA-Regional Federation of South Asian Library Associations, LIMISEC-Library Information Management and Service Centre, CLID-Council for Library and Information Development Nepal, Library

Development Forum, Nepal Library Foundation, LIS (Library and Information Society) Nepal, CLIPD-Council for Library and Information Promotion and Development, NELIC-Nepal Electronic and library information consortium, CDS/ISIS society, MARC study Group, e-Library School, Pokhara Library Association, Bhaktapur Library Association, are some other institutions existed in Nepal. And many international organizations have their representations in Nepal.

Associations	^Members		Total
	Life	General	
Nepal Library Association (NLA)	62	200+	262+
Tribhuvan University Library Science Alumni Association TULSAA	50	??	50+
Library and Information Science Students' Association – LISSA	-	40*	40
Nepalese Association of School Librarians – NASL	??	30	30
Nepal Community Library Association - NCLA	??	39	39
Bhaktapur Library Association – BLA	??	25	25
Pokhara Library Association – PLA	??	35	35
Total	62	449	441

LIS institutions: Central Department of LIS, Tribhuvan University is the highest institution to produce qualified human resources. It has master program which is recognized by NLA and many international universities and associations.

LIS Literature (Magazines, journals, books, articles)

The then Nepal Library Association in 1955 has published "Navanirman" fortnightly. It stopped after 3 issues. In 1957 the association published Bulletin of NLA. Since 1959 along with the disappearance of the Library Association no library literature published until a professional library association re established in 1979 in the Name of Nepal Library Association (NLA). NLA started to publish Voice of Library in 1980. However, after 8 issues it stopped to publish. In 1989 NLA started to publish NLA Courier. It was stopped to publish after one year. Luckily, again since 2006 is it is being published regularly.

TULSSAA Journal—The Tribhuvan University Library Science Students Association started to publish a half-yearly journal since Nov. 2000.

INFOLIB—This is a publication of LISSA (Library and Information Science Students' Association) since 2007. LISSA has been bringing its publication as a trinity (of LIS research articles, student's creativities and LIS Department of Tribhuvan University).

Magazine, Journal etc.

Sn	Type	Title	Date	Editors	Publisher/Patron
1.	M	NabaNirman	1955	Bashudev Baidya	NLA/Kaiser Shumser
2.	M	NLA Bulletin	1957		NLA
3.	M	Voice of Library	1980		NLA
4.	M	NLA Courier	1989-		NLA
5.	J	TULSSAA Journal	2000-	Salman Airey-Bishnu P. Aryal	TULSSAA
6.	J	INFOLIB	2007-	Durga P. Acharya, Bishwa Raj Gautam, Pravash Pokhrel, Ashok Thapa	LISSA / CDLIS, TU
7.	M	Samudayik Sachetana (Community awarness)	2002-	Ramaji Dahal	READ Nepal
8.	M				Room To Read Nepal
9.	M	Voice of Library-Monthly	2008-	Bishnu P. Aryal, Bishwa Raj Gautam, Durga P. Acharya	Sagarmatha Public Library
10.	M	NASL Newsletter	1995-		Nepalese Association of School Librarians
11.	M	NNL Bulletin			Nepal National Library
12.		Room To Read			Room To Read

Books— Writing a well comprehensive book is very challenging task. Not being a collaborative effort, we have few books on LIS. Some of them are presented with translated title in English. Our Library by Suryanarayan Shrestha, Outline of LIS by Mishra, Narayan and Shanti, Library Science: an introduction by Krishnaman Manandhar, Library and Nepal by Muraribinod Pokhrel, Usefulness of library science by

Madhusudan Sharma, Fundamentals of LIS Madhusudhan Sharma, Library Management Arun Raj et al., Library and resource centre management and operation by Indra P. Adhikari, Library management by Arun Rai et al.

Newsletters, Souvenirs and other publications are being published regularly by various libraries, LIS associations, institutions etc.

Books:

Sn	Title	Writer	Date	Publisher
13.	Our library	SuryaNarayan Shrestha	1967	Ramaji P. Wagle
14.	Outline of library science	Narayan and Shanti Mishra	1980	The writers
15.	Library science: an introduction	Krishnaman Manandhar	1980	TU Curriculum Dev. Center
16.	Library and Nepal	Muraribinod Pokhrel	1992	Cent. For lib. Consultancy
17.	Usefulness of library science	Madhusudan Sharma,	1996	Sanumaya Subedi
18.	Fundamentals of LIS	Madhusudhan Sharma		Nirala Pub. Jaipur
19.	Library management	Arun Rai et al.	2007	Vidyarthi Pustak

Source

And recently

20.	Library and resource centre : operation and management	Indra P. Adhikari	2008	LIMISEC
21.	Library science	Arun Rai	2009	Vidarthi Pustak
22.		Bishwa Raj Gautam	In press	The writer

LIS research: Most of the research products in Nepal in LIS covered by the Master thesis. Some organizations such as Health Net Nepal, Tribhuvan University Central Library (TUCL), Nepal National Library (NNL), Nepal Library Association (NLA), TULSSAA, LISSA, LIS Nepal, Dr. Dilli Raman Regmi Library are also carrying research activities. Most of the researches are only LIS service focused not on technology and innovation.

LIS ACTIVITIES

Seminars, workshops—we do not have a fix calendar of seminars workshops etc. However many seminars, workshops are held annually.

Nepal Library Association, TULSSAA, LISSA, TU Central Library, Nepal National Library, Central Department of Library and Information Science and some other associations and institutions conduct such activities.

LIS Advocacy: One of the objectives of all the LIS associations and institutions is LIS advocacy. NLA, TULSSAA, LISSA, Tribhuvan University Central Library (TUCL), NCLA, Read Nepal, Room To Read are doing various activities in LIS advocacy. One of the recent activities, in which all the LIS institutions and associations are actively participating is LIBRARY DAY (started since 2008 proposed by LISSA, decided to celebrate after a-8-month-long research). To date we have Library and information service national policy. Many acts are drafted and are to be billed in parliament such as legal depository act for National library, Library board act etc. Recently the upcoming constitution has incorporated provision for Library and community information centers promotion policy. As we made a submission of our proposal to recognize LIS by the constitution. Many educational policies have stated to make library an integral part of teaching and learning and school supervisor in district should provide report of the condition of the library of the very school as well.

Major activities by various LIS associations and institutions

Sn.	Institution	Major works
1.	Nepal Library Association	• Participation Of Libraries 1980 • Status Of Libraries And Librarians Of Nepal -1990 • Standardization of libraries And Information Service 1988 • Role Of Information In National Development 1990 • Survey On --Status Of Science And Technology Libraries, Documentation And Information Centers 1997 • Publications –Voice Of Library And NLA Courier, souvenir, directory of NLA 2007. • Saraswati Prize –National and International. This prize is offered to the persons / institutions that have contributed in LIS significantly. • LIS trainings • Involvement in the formulation of various LIS policies, manuals, courses etc. • IFLA Membership
2.	TULSSAA	• TULSSAA Journal • TULSSAA Gold Medal

		• Involvement in formulation of LIS policies etc. • LIS Trainings
3.	LISSA	• LIS National policy 2007 and the responsibility of state and librarians 2007. • INFOLIB Journal publication. • Initiation of LIBRARY DAY (Proposition, Research and Lead) • LIS experience sharing. • Current standard and improvement in LIS curriculum—discussion 2008. • Involvement in formulation of LIS policies, advocacy strategies etc.
4.	READ Nepal and NCLA	• Establishment of self-sustained community libraries in rural Nepal. • LIS training • LIS advocacy and Education • IFLA Membership
5.	Room To Read	• Establishment of libraries in schools. • Publication and dissemination of children literature. • LIS training.

Now many LIS institutions are organizing talks and workshops. Such as Role of Libraries in telecommunication promotion. LIS in Nepal: Possibilities of collaboration and unfolding the frontiers. Digital and electronic information resources for libraries by Tribhuvan University Central Library (TUCL) etc.

DIGITAL LIBRARIES AND ELECTRONIC DATABASES IN NEPAL

Nepal used computer (called Facit) in census in 1960 and in 1970 IBM 1401 before India used it in 1976. But now contrary to India we are still having our slower and slower pace.

Most of the libraries are not automated even with UNESCO's ISIS software. Still many libraries have not received computers even for record management. Below 10% libraries are automating various sections. Mostly these are automating Catalogue, circulation aspects. Out of total automated libraries more than 80% are using ISIS software of UNESCO. Some of the libraries (2%) are using corporate software such as ALICE, Liberty 3.0, SOUL etc. and nearly 15% libraries are using locally developed software such as LibInfo, Midas Library System, LIBRA, LMS etc. and 3% libraries are using customized and home built software such as KOHA. Moreover some of the libraries are using digital library software—GSDL, Evergreen, D-space etc.

More than 200 institutions have been using INASP/PERI for education and research. Tribhuvan University Central Library (TUCL) being the national coordinating agency of INASP/PERI had a greater success extending this program up to 2014 from the help of National planning commission and University Grant Commission. Moreover, various databases on health / medical and social science education are being used heavily. Many libraries have maintained separate electronic / online library section. We have a consortium named NELIC –Nepal Electronic Libraries and Information Consortium. We have representatives of eIFL—electronic information for libraries as well. Many database producers and vendors also providing their business orientation to our libraries, research centers and LIS conferences, workshops etc. Some of the commonly used databases are INASP/PERI, Ebsco Host, HINARI, CHINAL, Agora, Blackwell synergy, Oxford journals, Cambridge journals, Sage publications, Emerald Insight, Delnet, Jstor etc.

PROBLEMS

The problems which we are facing are not incurable. These are common to all of us. LIS advocacy, obligatory provision of efficient budget for libraries and professional librarians, the efficiency and activeness of librarians, continuation of education for LIS competence and abreast of current technical development, educational accreditation, employment opportunities, obsolete of course contents, recognition of the profession, etc. are some of the problems.

Possible options for solution: For LIS advocacy the national level LIS associations should take lead. These should be made a coalition in national and international level. For the case of Nepal many LIS institutions, associations come together for LIS advocacy. The best examples are Library Day celebration and submission of librarian's voice to constitution makers. Nepal also had a leading role for Regional Federation for South Asian Libraries Associations (REFSALA). We should energize REFSALA like institutions and explore more networks. For example the national library associations of the various nations should collaborate in various activities. The activities can be drafting LIS policies, strategies, programming, training, workshops, conferences, advocacy, librarians interchange, continuation of education, course accreditation etc.

Librarians should only work to respect their profession, they should be active in their works, research and various LIS related social and educational activities crossing the narrow boarder.

At this moment for us, I find the suggestions given by The National Agency for Higher Education committee 2004 of Sweden useful for us.

- Any candidate graduating from an LIS-school should have a thorough understanding of knowledge organization and retrieval and the principles and theories lying behind systems for knowledge organization and retrieval.
- In addition a librarian need to have a knowledge of the content to be acquired, organized and mediated, i.e. they need to have cultural and literary knowledge
- One should also develop the students' capabilities to understand and analyse LIS institutions and LIS-practice in a broader social context. How is LIS formed by its social environment? How does LIS form its environment? What is the social role of the profession and how is that role affected by social changes.

Another question is related to accreditation and certification of educational programs and library and information science professionals. I think we should make allies whose certificate is recognized.

CONCLUSION

In physical geography the size of Nepal is pretty small. It covers 0.3% land of Asia and 0.03% area of the world. However significant contributions have been made since ancient period, are our asset in the LIS history of Nepal and the world. Now due to various problems our pace of LIS development is slow. Recently activities on LIS are being increased in various methods such as publications public programs, workshops, meetings, talk programs etc.

There were 4 IFLA members in Nepal, but now only 2 are active members. The library and information institutions are now recognized by the up coming constitution of Nepal and Library Day is known to many and observed by them. Now students can major LIS subject in higher secondary and higher education. However we are experiencing we have very few LIS professionals and few libraries. The existed libraries are also in very pathetic condition. Nepal should encourage its professionals to organize LIS activities as well as attract various international LIS activities, trainings and researches into its land.

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Role of E-Resources in Technical Education

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ABSTRACT

A library plays an important role in disseminate knowledge in all the fields of technical education because it is basically linked up with the E-Resources of its users. This paper discusses the importance of E-Resources in technical education. It present different electronic resources. It describes about E-Resources use in Technical Education. The paper also attempts to describe the concept, types & important of E-Resources. It depicts that the E-Resources diffusion and utilization in Technical Education.

Key Words: E-Resources, Internet, Technical Education.

INTRODUCTION

Twenty first century is the age of information technology. In this age knowledge has become capital. Therefore this century is called as "knowledge based Economy". The development of every country is based on knowledge which is nothing but capital of all the nations. Libraries play a vital role in the development of every country. For such development of every country libraries should not only be traditional libraries but also the centers of information. Libraries are not only store houses of books but also a 'growing organisms' through which services are provided to users. In this age of Information Technology libraries are playing key roles as information centers. Revolution in information

technology has proved itself greater than green revolution and industrial revolution. It has changed human life. Information technology has proved useful in all walks of life such as educational, social, cultural, industrial and political. Therefore we have to keep aside the old methods of information collection like transmission, processing, and accessing. Now a day we have adopted new methods in libraries, to handle digital information. In the world of globalization every country should prove its ability to develop its teaching institutions for that libraries play a key role in the concerning institutions. In today's fast and luxurious life one has not enough time to access to the libraries. We can cure those deficiencies by providing the library services & effective use of its resources by adopting E-resources. E-resources will provide the library service to a busy user at his residing place and at any time. E-Resources have been used to get accurate information within second. E-Resources are used in almost all the libraries. In libraries 'classifier' and cataloger' are replaced by 'communicators' and 'net-workers'. This is known as skilled organizes of knowledge. Today exchange of information has not been confined to a library. All the libraries from regional to international level are interlinked by E-resources, Internet, E-books, E-journal. As a result digital libraries came into existence.

TECHNICAL EDUCATION

The technical educational system in the country covers courses in engineering, technology, management, architecture, pharmacy, etc. The Ministry of Human Resource Development caters programs at undergraduate, postgraduate and research levels. The technical education system at the central level comprises among others such as: AICTE, IITs, IIMs, IISc, IIITM, IIIT, IIITDM, NITs. New initiatives have been taken to promote research in technical education to improve quality in education, i.e. access to electronic journals and databases is being provided to all technical institutions.

E-RESOURCES AND TECHNICAL INSTITUTIONAL 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 are also tools and services that provide instant access. It searches information and transfer information to any corner of the world. Technical education institute 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. Technical Education institutions should provide e-resources to both teachers and student with the expectations that the E-resources will be used for educational purposes.

WHAT ARE E-RESOURCES?

Any electronic product that delivers a collections of data, it may be text referring to full text databases, electronic journals, image collections and others 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 defines the term" E be called on E-Resources".- Resources as any resources that are available over the internet can

WHY ELECTRONIC RESOURCES?

This is the age of globalization, industrialization and liberalization. The world has become a global village. Anyone can access information by sitting in the corner of his house through internet. Books in the libraries are now available in digital form. In this era the libraries are undergoing through changes. The libraries are providing information through electronic sources. In the same way the books are also published in the digital form. Scholars and writers publish their research articles and books on internet. The users also prefer electronic books instead of hard copies.

PURPOSE OF USING E-RESOURCES

The main purpose of using e-resources is to improve the efficiency of library and to render services to end users and to provide effective information services to faculty, research scholars and students in 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 format 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 of time e-resources have expanded from a few dozen computerized database bibliographies 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.

Features of E-Resources

- E-Resources are available only in Electronic form using different formats.
- Accessibility from anywhere, home, school, libraries, during travel etc.
- Any change in E-Resources can be made available quickly.

- E-information through e-commerce.
- Advanced search and retrieval can be used simultaneously by more than one user.

Type of E-Resources

Internet

To accomplish exchange of information all the computers on the Internet have to use a common set of rules for communication. The internet is a global 'networks of networks' and consists of millions of host computers. The host computers that are joined together by a common language and have unique addresses serve as information repositories.

Consortia

The consortia can play an important role in acquiring licenses and sharing electronic resources by acting as a platform for promoting activities and programs in the area of electronic resources sharing.
The Oxford English Dictionary defines "a consortium is a community of two or more information agencies which have formally agreed to coordinate, cooperate, or consolidate certain functions to achieve mutual objective."

The main aim of the consortia is to access particular information for all higher educational institutions, research centers in the world. The major models of consortia exist at National and International level. The concept of 'Consortia' was evolved from the concept of co-operation and co-ordination. The term consortia refer to an agreement or group formed to undertake an enterprise beyond the resources of any one member. Library Consortia mean group of libraries working together for a common cause. It means collaborative or coalition effort for meeting the varied needs of users. It may be defined as any kind of formal cooperative arrangement where people agree to exchange information or resources.

The Library Consortia mainly deal with resource sharing in digital or electronic format. Co-operation among libraries is now an accepted compulsion. It has existed in different forms, in different countries for many years. Some co-operation was and still is informal, while other types of co-operation encompass complex process to share collections or services. Traditionally, library co-operation meant sharing collections. It also included sharing of services, or of processes, such as joint cataloguing of materials, or of staff and user training. Mostly, co-operative efforts had an economic motive, and this continues even today. Recent developments in library funding, and the growth in importance of electronic materials has led to a change in thinking about how libraries co-operate, and the growth of formal co-operative entities. i.e. Library

consortia. The library consortia are also often called Library networks. These formal organizations operate for the mutual benefit of all participating libraries.

Some of the successful Library consortia setup so far in India are,

Sl.No	Name	URL
1	INDEST(MHRD)	http://paniit.iitd.ac.in/indest/
2	UGC INFONET(INFLIBNET)	http://web.inflibnet.ac.in/info/
3	FORSA	http://www.iiap.res.in/library/forsa.html
4	.HELINET	http://www.rguhs.ac.in/hn/ne whell.htm
5	CSIR	http://www.niscair.res.in/
6	ICMR	http://www.jcccicmr.
7	IIM	http://www.iimahd.ernet.in and www.iimb.ernet.in
8	ICICI Knowledge Park	http://www.iciciknowledgepar k.com/
9	ISRO	http://www.isro.org/
10	J-GATE	www.j-gate.informindia.co.in

E-JOURNAL

Today there are thousands of electronic journals, scholarly publications that are available on-line via electronic network along with print. E-journals are full text journals that are accessible via internet. According to Harrods librarians Glossary, "An electronic journal is a journal for which the full end product is available on dies over a network or in any other electronic forms strictly a journal in which all the process is carried out electronically. In other words an electronic journal is one where the writing editing, referring and distribution of item are carried out without any paper intermediaries."

Electronic journals are the fast developing feature of electronic publications. They can be broadly grouped in two categories
1. Outline journals 2. CD ROM journals.

E-Book

The electronic version of a book covering its full contents text, tables, diagrams, illustrations etc. E- Book collection usually mounted in an E data bases which support full text searching within an across titles advanced search and book marks. .User can view full text of E-books in HTML &PDF formats on line.

E-Databases

Is an organized collection of information's, of a particular subject or multidisciplinary subject areas, information within E-Data bases can be searched and retrieved electronically. There are two types of E-databases viz.1) Full text databases 2) Bibliographic databases.

ADVANTAGE OF E-RESOURCES

An electronic information resource offers enormous benefits. They provide users faster, more convenient and anytime access from home, campus or library as well as it has special features such as hyper text link to related information- graphics, audio, video and animation. Online retrieval of information has become popular. These resources also offer benefits to libraries. Electronic information can provide a number of advantages over traditional print based sources. They open up the possibility of searching multiple files at one time. Through these resources a file can be accomplished more easily than using printed equivalents. One main advantage especially to distant learners or those who have limited time to access to the libraries is that they can effectively access to the libraries by dialing up process.

CONCLUSION

E- information resources and services have been ever increasing day by day in the present day contemporary information environment , to overcome the problems of diminishing budgets, increasing information needs of the academicians and the researches, publishing of newly generated knowledge in varied forms and formats, problems faced by libraries in providing varied services, collecting of all documents published both at national and international levels.

Libraries and information centers are finding it hard to maintain the subscription for core journals due to ever increasing of cost of journals subscription and also shrinking budget Improving the quality standard of research in Universities and research institutions in India and bringing it to a level of global recognitions by improving the access base of Literature to them. Whole World in moving towards electronic publishing and the cost of the electronic publishing is much cheaper than that of the print version. Researches can now access to learned journals in electronic from. Because of this need it is essential to know the concepts of e-resources.

E-resources in prime way to achieve the information sharing need by very effectively and efficiently. In present day prices of printed format journal are increasing. In such situations e-resources plays vital role in information age.

SUGGESTIONS

To update the knowledge, the knowledge of E-Resources is essential to every individual.

- Libraries in Technical Education must be equipped with E-Resources. If is an urgent need of the day.
- Policies should be adapted to regarding implementation of E-Resources in Technical Education.
- Users are well as the library staff should be given training to learn how to use E-Resources.
- Researches in Technical Education should be done through E-Resources. For it is flexible, convenience, wide reach & easily accessible.

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The Faculty Development Programmes (FDP) and Library and Information Science Education in India: Role of UGC

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ABSTRACT

Library and Information Science (LIS) education in India is become incredibly difficult due to the application of Information and Communication Technology (ICT). On the other hand the faculty of LIS domain is having so many administrative responsibilities therefore they find their selves in a complex situation to keep them update and competence with the ICT application. This paper is an attempt to provide a compressive report on Faculty Development Programs ((FDP) running by the University Grand Commission (UGC) in India, It also throws some light on the need and issues, purpose of FDP, the eligibilities required for FDP. Finally the problem and challenges for the proper implementation of FD and the future programs to be conducted by UGC.

Keywords: LIS Education, Faculty Development Programs, UGC- India,

INTRODUCTION:

The Orientation programme is intended to inculcate in the young lecturers the quality of self- reliance through awareness of the social, intellectual and moral environment as well as to discover self-potential and confidence. The orientation programmes contributes to the teacher awareness of the problems of the Indian society and the role of

education, higher education leaders and educators in the resolution of these problems to achieve desired goals in national development. **(UGC website, www.ugc.ac.in).**

Faculty development is a similarly used term to staff development and professional development, in settings that pertain to teachers. **(Gaff, 1994).**

Professional development for teachers may include teacher training, and is usually considered pre-service (or before beginning teaching) and post- service (or during services). However faculty development and professional development may both be used to refer to on-going professional learning for faculty. Such learning may take place during work hours, such as "in-service" within organization, or it may be beyond work hours. These learning pursuits may be for credit or noncredit; therefore they may be with a college or university, through a school district, or private consulting agency. Additionally faculty may pursue self-directed learning professional development, although the term faculty development is less commonly applied to this scope of activity. Faculty development has very different traditions, practices and terminologies. **(McKeachie, 1991).**

Although teaching has been at the core of faculty life from the beginning of the modern university, emphasis on teaching improvement is a more recent phenomenon. Centers and programs that support excellence in college and university teaching have grown substantially since the mid-twentieth century, and offer a broad range of services and resources to various constituencies.

INSTITUTIONS FOR FACULTY DEVELOPMENT:

In the late 1960s, only forty to fifty faculty development programs existed at colleges and universities nationwide; by the middle of the 1970s that number had exploded to more than 1,000. The American Association for Higher Education (AAHE) spins off the National Education Association (NEA) in 1969. In 1976 a group of faculty developers founded the Professional and Organizational Development Network for Higher Education (POD), and in 1978 private and public grants helped establish the National Institute for Staff and Organizational Development (NISOD). Publications, conferences, and other activities by these three groups helped advance both the practice of faculty development and the visibility of teaching in higher education. The assessment movement that took center stage in the 1980s reshaped both perceptions of teaching and the work of teaching-improvement programs. Advocates of assessment, from inside and outside the academy, asked pointedly, "Are students learning anything in college?" **(Wright, 2001).**

Towards Teaching to Learning: As attention shifted from teaching to learning, faculty development work also changed its focus. Improving teaching techniques remained an important component of most programs, but more and more developers encouraged faculty to think about student learning. "Classroom assessment techniques" (CATs), pioneered by Thomas A. Angelo and K. Patricia Cross, emerged as a new and powerful way for faculty to regularly and informally monitor learning. Besides promoting the use of CATs, many teaching programs also emphasized topics such as cognitive processes, motivational strategies, and learning styles.

Public Accountability: In the early 1990s Ernest L. Boyer of the Carnegie Foundation for the Advancement of Teaching, along with allies from the AAHE and other groups, proposed a significant reconsideration of faculty roles and responsibilities, including teaching. These proposals responded both to the assessment movement and demands for more public accountability in higher education, and to advances in learning sciences. A core component of Boyer's vision involved "**the scholarship of teaching.**" Boyer argued that, like other forms of scholarship, to be scholarly the act of teaching must be public, open to critical evaluation by peers, and usable by others in the discipline. The intellectual energy created by Boyer's proposal coincided with other trends to produce another period of growth and expansion for teaching-improvement programs. **(Boyer, 1990)**

By 1994 roughly one-third of colleges and universities had a formal center for teaching improvement, and another third was considering the creation of a center. These centers existed at many (61%) research universities, and at some (41%) doctorate-granting institutions; such centers were relatively rare at liberal arts colleges and community colleges, although nearly all institutions had some sort of faculty development program, often focusing on teaching and learning.

Activities towards Faculty Development: In 1986 the Ohio State University hosted the first national conference on teaching assistant development; seven years later a consortium of universities and private foundations launched Preparing Future Faculty, a major national initiative to train graduate students to be effective teachers and scholars. Preparing Future Faculty programs, and variations on that model, spread quickly, becoming a significant component of teaching center work at many research universities by the end of the decade. Teaching centers also became assets to colleges and universities that struggled to deal with technological revolutions, changing student demographics, and increased competition in higher education.

HISTORY: INDIA

The history of faculty development in India starts from the establishment of University Grant Commission (UGC) in 1953. UGC is a governing body for higher education in India. UGC is following National Policy on Education 1986 and its programs in action. Commission set up 66 Academic Staff Colleges (ASCs) and Refresher Course Centers (RCCs) in different Universities and colleges in India for Faculty Development. UGC is continuously conducting orientation programs for newly appointed faculty and refreshers course for in services faculty. The main feature of these courses is that these are running around the year and are non – vocational. Several courses running by UGC in the present year based on different fields and subjects. The commission has been providing 100% financial assistance to the host universities. **(UGC website, www.ugc.ac.in).**

There is no doubt that UGC play an important role in conducting such programs for the faculties. In India there are several other institutions are also available which are providing such facilities for their faculties. National Institute for Science Communication and Information Resources (NISCAIR), Information and Library Network (INFLIBNET), Association of Special Library and Information Bureau. (ASLIB), Defense Research and Documentation Organization (DRDO) and Developing Library Network (DELNET). These professional bodies are also organizing few orientation programs for the faculty on the regular basis. Advancement of Information Communication Technology (ICT) has boosted up the faculty development programs for the teachers in not only for higher education but also in school education. Various committees and commissions have been set up by the UGC to research in this field.

NEEDS FOR FACULTY DEVELOPMENT:

As computers and networked technology became everywhere, new ways of teaching and learning attracted many colleges and universities to explore distance and asynchronous education. These changes challenged teaching centers to help faculty and institutions focus on learning rather than on gadgets and attention-grabber. Changing student demographics also confronted college teachers, leading to increased work for teaching centers to address the needs of adult learners in more culturally diverse classrooms. The quality of teaching and learning also became an issue as the growth of for-profit higher education and the production of distance-learning programs gave students new opportunities to choose where, when, and how to pursue their education. The following reasons are responsible for need of Faculty Development:

1. Technological Revolution

2. Changing student demography
3. Increased competition in higher education
4. Teaching styles and competencies
5. Administrator's attitudes and intuitional policies
6. Changing of faculty attitude and psychology
7. Focus on personal growth
8. Professional development
9. To cope up with fundamental changes in the society
10. Gaining student approval, enhance student learning and need to evaluation
11. Organizational growth and improvement of teaching environment
12. Undertake process of challenge
13. Update with new knowledge

PURPOSE OF FACULTY DEVELOPMENT:

1. **Effectiveness of faculty:** The main and foremost purpose of Faculty Development programs is to enhance the effectiveness of faculty. The student assessment quality improves by these programs.
2. **Improve efficiency of the faculty:** Dealing with so many changes in the teaching environment is the difficult task to the newly appointed teachers. These oriental programs helps to the teachers to settled in the teaching environment.
3. **Enhance the knowledge base:** Oriental programs helps in enhanced the knowledge base of the faculty.
4. **Changing need of professionals:** With the advancement of the new technologies and method using for the teachings are rapidly changing therefore the needs and demands of the professionals has been more increased. ICT and digitization have tremendous effect on the teaching.
5. **Increase job satisfaction:** The satisfaction comes from experience, learning and developing skills of teaching. Refresher's course helps to improve teaching skills.
6. **Career advancement and maintain competencies:** The oriental programs are very useful in career advancement for the teachers.

7. **Managerial improvement:** Teachers learn the managerial techniques from the courses organized by the universities and colleges. They become familiar with the decision-making.
8. **Personal and financial development:** Not only personal advancement but also financial development is possible by such programs. Universities are providing the facilities to their faculty.
9. **Further Research:** During the course of study the faculty may get the chances of pursuing in the research programs. They are also published several articles based on the respective research.
10. **Enhance existing qualification:** Faculty development programs enhanced the existing qualification of the concerned faculty. They learns new technologies of their concerned field. Thus they implement new ideas and techniques into their teaching styles.
11. **Revision of curriculum:** Through the oriental programs the teacher revised their courses of study in their respective subject. Old syllabus has replaced by new ones.

ELIGIBILITY OF TEACHERS:

1. **New Teacher:** New faculty may have to attend oriental programs for six years and even after six years of services. A gap of one year for attending refresher course for teachers who have not attended recently organized programs.
2. **Working Teachers:** Under section 2(f) of UGC act there is a provision for the working faculty from more than three years they join any refresher course. Secondly who have not associated with UGC Act and completed five years in the sponsoring university they may be permitted for refresher course.
3. **Temporary/ Contract Teachers:** who have been teaching for at least two academic sessions may have participated in the refresher course. However the Ph.D. holder exempted to this provision.
4. **Superannuate Teachers:** UGC has decided that the teachers who are superannuating next three years to be exempted to attend refresher course.

NOTE: The number of course under Career Advancement Scheme is depending upon the concerned University/ College.

CURRICULUM AND COURSE MATERIAL

UGC has decided that the course content of the oriental programs and refresher courses are prepared, restructured and also taught with the help of experts of eminence in the subject field to be used as resource person for Academic Staff Centers (ACSs) and Refresher Course Centers (RCCs). The curriculum of these programs is prepared by the expertise involvement. The content of the Refresher course will have essential percentage of the core material in the subject discipline along with required percentage of areas of emergence and priority, (both national and global), essential laboratory and practical component, computer application and I.T. Contents, if required with relevant advancement to the subject discipline. The course materials are providing to the concerned teacher in printed form before joining the course.

The curriculum for the Academic Staff Orientation Course may have the five components with 144 contact hours, i.e., 6 hours daily for 4 week programmes and 3 week Refresher Courses may have a minimum of 108 hours as already communicated to the UGCASC/ RCC. In addition, computer awareness and application of computers in teaching and research in different areas as relevant for the subject disciplines. All UGC-ASCs and UGC - RCCs have been requested to take steps to implement the programmes/courses accordingly.

HOW TO JOIN FACULTY DEVELOPMENT

1. Applications send through proper channel.
2. Application may be obtained and submitted from the concerned UGC ASC/ RCC as per scheduled **(See Annexure II).**
3. There is a registration fees Rs. 500/- (Non- Refundable).
4. There is no direct correspondence to the UGC in this regard.
5. A participating candidate can go to the next ASC/ RCC if he/she not found a suitable area of study nearby.
6. The sponsoring university will treat the participating teacher selected for the program as on duty with full pay and allowances.

FINANCIAL ASSISTANCE: UGC ACT HAS PROVISION

UGC provides adequate grants to the sponsoring universities/ colleges for organizing faculty development programs. There is a provision under section 2(f) of UGC Act that rail fare for 1st or 2nd class up to 500 kms. Or over 12 hours of journey whichever is less provides by the university on the production of valid documentary proof. Free boarding and lodging by the university UGC provides Rs. 300/- per day for "A" Class city and Rs. 250/- for other places. Apart from this Rs. 100/- per working day for

hospitality services. In case of only free lodging is provided then D.A. will be allowed 75% of the ordinary rate. **(UGC website, www.ugc.ac.in).**

ACTIVITIES AND SERVICES

Although the extent of content and scope of teaching-improvement programs and centers can vary substantially from institution to institution, most offer some combination of the following services.

1. **Consultation services.** These services enable individual faculty, as well as departments and schools, to better observe, assess, improve, and enhance their teaching practices. Such consultations may include instructional or curriculum design assistance, creation of models for evaluating teaching, videotaping of classes for review, classroom observation, or interviewing participating candidates to gather anonymous feedback for the instructor.

2. **Programs on teaching.** These programs include a broad range of offerings across such categories as audience (from a guest speaker on effective lecturing for all university faculty, to a workshop on active learning for LIS teaching assistants), length (from a semester-long credit-granting graduate course on teaching sociology, to a one-hour lunch discussion about diversity in the classroom), and incentives for participation (from a required orientation for all new teaching assistants to a voluntary discussion group on teaching with cases, to a stipend-funded fellows program on service learning) **(Murray, 1999).**

3. **Grants, awards, and other incentives.** Incentives are offered to motivate improvement in teaching or to reward excellence in teaching. These incentives can take a variety of forms, such as grants or release time for course redesign or other curricular innovations; fellows programs to build teaching-improvement support between peers; or financial support for attending professional conferences.

4. **Continuing Education Programs (CEP):** Continuing education refers to any type of post- doctoral education e.g. M.Phil. /Ph.D. used to either obtain additional certifications, or as credits required to maintain a license. Continuing education can take the form of workshops, seminars, Adhoc courses, project consultancy, home study or online courses, conferences, tours or hands-on training. There is no specific format or length for a continuing education program: some may take a weekend, while others can span weeks, months or even one day seminar. A common characteristic to all continuing education programs is a

registration process. Attending a conference or cultural event that is open to the general public does not give attendants any type of education credits, and cannot be considered formal training. Orientation and refresher's course are the important part of the CEP. **(Class Notes, 11.09.2009)**

5. **Print and electronic resources.** These resources typically include libraries of books, videotapes, and articles on a variety of issues pertaining to teaching and learning in higher education. Some centers or programs publish their own newsletters or develop websites to further highlight research, principles of good practice, or other explorations on teaching.

PROBLEMS AND CHALLENGES

The success of faculty development programs is influenced by various factors including a shared vision, responsiveness to faculty needs, involving faculty in planning and program development, clearly defining and communicating policies, goals, and objectives **(Wright, 2000).** Invariably, faculty development is more effective when participants set their own goals, plan their own learning, use experiential learning, and evaluate outcomes in terms of achievement of their own goals **(Lewis, 1996).** Likewise, it is essential to conduct needs assessment before initiating faculty development programs, and following up the programs with frequently reviews to highlight the progress made and areas to be addressed **(Graf, 1997).**

1. **Communication gap:** There is no proper communication between faculty and sponsoring bodies. No proper advertisement for the programs to be held.
2. **Organizational Behavior:** Sometimes the sponsoring university/ colleges are not very helpful to send the faculty for attending the course. It is because they think that work affecting the absence of faculty.
3. **Personal problems:** Individual reasons may course to not to attend the programs organized by the university.
4. **Institutionalizing Curricular changes:** there are very frequently changes are being made in the curricular of the LIS field. It is not therefore feasible to organize the programs so speedily nor the institutes the time for the programs to organize so fastly.
5. **Increasing numbers of participating teachers:** It is difficult to concerned university/college to sent their maximum numbers of teacher to attend the orientation programs at one time therefore this a challenge before organizing institution.

6. **Promoting Publication and enhance knowledge** A teacher may expected to innovate and enhance the existing knowledge therefore while attending programs like continue education the institute may expect few publication by the teacher concerned. They are motivated with these programs.

7. **Maintenance of cadre:** This challenge before the institute organizing the CEP to their teacher. Maintenance and updating the curriculum of these courses.

CONCLUSION

There is a strong link between the continuing development of the institute's staff and the development of the institution. One of the undoubted strengths of the Institute is the skill and knowledge of our staff and we encourage them to develop both professional and personal skills as well as knowledge appropriate to their role

Glenn Erickson suggested various strategies for improving teaching practices, which can be comprehensive approach to faculty development. In order to succeed at new teaching tasks, faculty development is essential. It is a tool for improving the educational vitality of academic institutions through attention to the competencies needed by individual teachers, and to the institutional policies required to promote academic excellence. Over the past three decades, strategies to improve teaching have been influenced by the prevailing theories of learning and research on instruction, which are described. A comprehensive faculty development program should be built upon **(Erickson, 1986)**

1. Professional development (new faculty members should be oriented to the university and to their various faculty roles);

2. Instructional development (all faculty members should have access to teaching-improvement workshops, peer coaching, mentoring, and/or consultations);

3. Leadership development (academic programs depend upon effective leaders and well-designed curricula; these leaders should develop the skills of scholarship to effectively evaluate and advance medical education);

4. Organizational development (empowering faculty members to excel in their roles as educators requires organizational policies and procedures that encourage and reward teaching and continual learning). Comprehensive faculty development, which is more important today than ever before, empowers faculty members to excel as educators and to create vibrant academic communities that value teaching and learning.

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Annexure I: LIS Programs Offered Various Universities/ Colleges funded by UGC.

S. No.	Name of University	Numbers of Orientation Programs
1	University of Delhi, Delhi 110007	3
2	Osmania University, Hyderabad- 500 007	5
3	Sri Venkateshwara University, Tirupati - 517 502	5
4	Pt. Ravishankar Shukla University, Raipur – 492 010 (Chattisgarh)	4
5	Gujarat University, Nairangpura, Ahmedabad - 300 009 (Gujarat)	3
6	Kurukshetra University, Kurukshetra - 132 119 (Haryana)	3
7	University of Kashmir, Hazarat Bal, Srinagar - 190 006.	5
8	Karnatak University, Pavati Nagar, Dharwad - 580 003 (Karnataka)	5
9	University of Mysore, Mysore - 670 005 (Karnataka)	5
10	University of Calicut, Calicut – 673 535 (Kerala)	5
11	Dr. B.A. Marathwada University, Aurangabad -431 004 (M.S.)	4
12	University of Pune, Gnesh Khind, Pune - 411 007. (M.S.)	4
13	Manipur University, Canchipur , Imphal – 795 003 (Manipur)	4
14	Sambalpur University, Sambalpur - 768 019 (Orissa)	3
15	Pondicherry University, Lawspet, Pondicherry - 605 008.	5
16	Guru Nanak Dev University, Amritsar - 143 005.	4
17	Aligarh Muslim University, Aligarh - 202 001 (U.P.).	5
18	Banaras Hindu University, Varanasi- 221 005 (U.P.)	3
19	Kumaun University, Nainital – 263 001 (Uttranchal)	3
20	University of Calcutta, 92, A.P.	5

	Chandra Road, Calcutta- 714 009.	
21	Jadavpur University, Calcutta -700 032 (W.B.)	5

Besides Orientation Programme / Refresher course, every Academic Staff College will conduct 2 to 6 short term courses including seminar, workshops, discussion groups and professional development programmes each 2 to 6 days duration for senior faculty, academic administrators /

UGC staff / non-academic Group'B' &'C' during 2009-2010. Duration, Type of participants, to each programme & other details will be decided by the Advisory Committee of the respective Academic Staff College.

Annexure II: Courses Being Offered by UGC in the Academic year 2009 –10 in the Library and Information Science.

Schedule of Refresher Courses in Humanities Subjects to be conducted by Academic Staff Colleges / Refresher Course Centres during 2009-10

Name of State	Name of UGC-Academic Staff College (UGC-ASC) and UGC-Refresher Course Centre (UGC-RCC)	ASC/ RCC	Dates of Programme / Course
Library & Information Sciences			
A.P.	Osmania University, Hyderabad	ASC	17-08-09 to 05-09-09
Delhi	University of Delhi, Delhi	ASC	08-06-09 to 27-06-09
Jammu & Kashmir	University of Kashmir, Srinagar	ASC	07-07-09 to 30-07-09
Karnataka	Karnatak University, Karnatak	ASC	02-06-09 to 22-06-09
	Mysore University, Mysore	ASC	05-08-09 to 25-08-09
Kerala	University of Calicut, Calicut	ASC	06-05-09 to 26-05-09 07-10-09 to 27-10-09
M.P.	Devi Ahilya Vishwavidyalaya, Indore	ASC	02-12-09 to 22-12-09
	Dr. H. S. Gour Vishwavidyalaya, Sagar	ASC	31-08-09 to 20-09-09
M.S.	Dr. B.A. Marathwada University, Aurangabad	ASC	02-01-10 to 23-01-10
Manipur	Manipur University, Canchipur, Imphal	ASC	20-07-09 to 06-08-09
Meghalaya	Mizoram University, Aizawl	ASC	03-09-09 to 23-09-09
Orissa	Sambalpur University, Sambalpur	ASC	09-10-09 to 29-10-09
Pondicherry	Pondicherry University, Pondicherry	ASC	03-03-10 to 30-03-10
Panjab	Guru Nanak Dev University, Amritsar	ASC	16-10-09 to 05-11-09
U.P.	Aligarh Muslim University, Aligarh	ASC	10-03-10 to 30-03-10
	(U.P.)		
	Banaras Hindu University, Varanasi (U.P.)	ASC	01-09-09 to 21-09-09
Uttranchal	Kumaun University, Nainital	ASC	13-11-09 to 03-12-09
West Bengal	Jadavpur University, Calcutta	ASC	18-08-09 to 07-09-09
Library Sciences			
A.P.	Sri Venkateshwara University, Tirupati	ASC	20-07-09 to 08-08-09
Chattisgarh	Pt. Ravishankar Shukla University, Raipur	ASC	01-12-09 to 22-12-09
Gujarat	Gujarat University, Ahmedabad (Gujarat)	ASC	26-10-09 to 15-11-09
Haryana	Kurukshetra University, Kurukshetra	ASC	02-12-09 to 22-12-09
Kerala	Kerala University, Kariavattom	ASC	02-05-09 to 22-05-09
M.S.	University of Pune, Pune	ASC	
West Bengal	University of Calcutta, Calcutta	ASC	02-01-10 to 22-01-10

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UGC Evaluation System of Faculty for CAS and its comparison with ICAR's Promotions

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ABSTRACT

The paper deals with the study of UGC evaluation system of faculty for career advancement scheme and its comparison with the revised guidelines of ICAR used for promotion of scientists. The study is mainly based on academic performance indicators adopted by UGC and ICAR and their weightage points. These academic performance indicators are related with various teaching and related activities, co-curricular and extension activities, research contributions in journals and proceedings, other research publications, research projects and many other profession related and institutional activities. The study concludes that these systems provide well defined scoring system for evaluation of faculties for promotion under CAS and found some indicators which require revision. The study opens the door for further research on these and other related evaluation systems to help higher education and research and development activities.

INTRODUCTION

Education is the most effective system which helps in the gaining of knowledge, development of skills, capability to observe and analyse various things and ideas in people and making their life dynamic and vibrant. There are three stages of education – elementary, secondary and higher education (college and university level). The higher education system in India is one of the largest systems in the world. This system includes central universities, state universities, colleges, IITs, IIMs, and

various other institutes devoted to education and research in specific fields like medical, engineering, management, agriculture etc.

UNIVERSITY GRANTS COMMISSION (UGC)

For controlling and regulating education at college and university level Indian government has established a commission in 1953. This is known as University Grants Commission (UGC) [1]. UGC is mainly responsible for making and applying standards of higher education and providing grants to universities and colleges. It also encourages research and development activities in various disciplines at university and college level. The UGC provide assistance to universities and colleges for approved development programs in the area of higher education. Some important steps taken by UGC for the development of higher education includes special assistance to centers of the advanced studies, assistance for improvement of the quality of teaching and research, seminars and orientation courses for teachers, special assistance to teachers education and research, revision of scales of pay of the teachers in the universities and colleges, facilities for research and annual awards to outstanding scientists and teachers. For encouraging the creativity, capability and motivation to achieving excellence of the faculty UGC provides guidelines for appointment and promotion of faculties at various levels. As required, it makes necessary amendments in these guidelines from time to time. In 1986 the UGC introduced the Career Advancement Scheme for faculties which has made it compulsory for university and college teachers to attend an orientation program and three refresher courses in order to gain promotion [2]. Each promotion has been linked with formal and informal continuous professional development activities.

UGC constituted an expert committee for preparing draft of regulations on minimum qualifications for appointment of teachers and other academic staff in universities and colleges and measures for the maintenance of standards in higher education. This committee gives report in which it proposed guidelines for evaluation of performance of faculties based on their achievements in teaching and research activities [3]. These regulations are related with revision of pay-scales, minimum qualifications for appointment, and other service conditions of universities and college teachers, librarians and director of physical education. This evaluation provides a base for promotions of faculties in various universities.

ORIENTATION PROGRAMS AND REFRESHER COURSES

The UGC (India) had setup large number of Academic Staff Colleges (ASCs) in different universities/ institutions in the country. These ASCs are conducting specially designed orientation programs for newly appointed lecturers and refresher courses for in service teachers [4]. The

orientation programs explore the quality of self reliance in young lecturers through awareness of the social, intellectual and moral environment and also discover self-potential and confidence. The Commission chooses universities / institutions as UGC refresher course centre for running specialized refresher courses. These refresher courses provide teachers opportunity to exchange experience with their peers and mutually learns from each other. It also works as a forum for discussing the latest advances in the subjects, technological spin off etc.

These courses are arranged for those teachers who are eligible as per UGC-ASC rules and regulations. The newly appointed teachers may attend the orientation programs up to 6 years of continuous service and also after 6 years under career advancement scheme. Then after one year these teachers can attend the refresher courses. University and college lecturers who are included in the list of colleges under section 2(f) of UGC Act may participate in the refresher courses. The teachers of those colleges which are not included under this section but affiliated to any university for at least 5 years, can also participate in refresher courses. The temporary/ contract teachers teaching for atleast two academic sessions in any university or its affiliated colleges and institutions may also allowed to participate in orientation programs / refresher courses to enhance their skills.

As per UGC notification on "Revision of pay scales and minimum qualifications for appointment of teachers in universities and colleges and other measures of the maintenance of standards" for promotion in senior scale, lecturers should also participate in at least one orientation program and one refresher course (Ph. D. degree holders are exempted from one refresher course). For promotion from senior scale to selection grade, participation in two refresher courses is must. The participation in orientation program and refresher course is mandatory requirement for career advancement of faculty members. All eligible teachers are essentially required to attend orientation programs and refresher courses. Also the universities and colleges allow interested eligible teachers to attend these UGC-ASC courses.

UGC has attempted to provide national character to these programs to bring good quality and status in the courses. In this attempt, the course content of the orientation programs and refresher courses are prepared, restructured and also taught with the help of eminent experts in subject discipline. The content of refresher course will have core material in the subject discipline, areas of emergence and priority, essential laboratory and practical component, computer applications and IT contents. The content of orientation programs are mainly IT based like the use of tools,

internet literacy etc. Courses under UGC-ASC are conducted round the year and are non-vocational [5].

UGC-CAS GUIDELINES

For promotions and career advancements, the expert committee constituted by UGC has recently recommended guidelines [6]. Some important recommendations are as below

1) ***Academic Performance Indicators (API) and Weightage Points (WP):***

UGC adopted Academic Performance Indicators (API) and their Weightage Points (WP) for evaluation of the faculties. These academic performance indicators and their weightage points are applicable on faculties of Science, Engineering, Agriculture, Veterinary science, Medical science (grouped in Group A) and Languages, Arts, Humanities, Social sciences, Library, Physical education and Management (grouped in Group B). Following are the academic performance indicators and weightage points under various heads.

a. ***Teaching and related activities***: Teaching and contribution to professional related activities are the main indicators for any type or grade of faculty. The committee grouped these activities into essential and desirables activities. The essential activities include: number of lectures in classes allocated and taught; number of hours allocated and actually spent on tutorials, seminars, practicals, contact hours; lectures and other teaching duties in excess of UGC norms; imparting of knowledge/ instruction with the prescribed material and methodology of the curriculum; college/ university examination duties (question paper setting, evaluation of answer scripts, assessment of internal/ continuous work, coordination, invigilation, flying squad duties etc). The desirable activities include: use of innovative teaching-learning methodologies, ICT materials; updated subject content and course improvement; developing and imparting remedial/ bridge courses, counseling modules, soft skills/ communication skills/ personality development courses, specialized teaching-learning programmes in physical education, library, innovative compositions and creation in music, performing and visual arts, other traditional areas; organizing and conduction of popularization programmes/ training courses in computer assisted teaching/ web-based learning. The maximum scores for these activities are given in table in category I.

b. ***Co-curricular and extension activities*:** Faculties can make contributions to co-curricular and extension activities. These activities include: corporate works through meetings, popular lectures, subject related events, articles in college magazines and university volumes;

institutional activities such as field studies, educational tours, industry-implant training and placement activity; community services, social orientation and other student mentoring activities through NSS, NCC, NSO, govt. and non govt. channels; socio-cultural and sports programmes at various levels; professional ethics and campus development activities, environmental education, value based programmes for TV/ Radio. The maximum scores for these activities are given in table in category II A.

c. *Profession related contribution*: There are some profession related activities found important for career advancement of faculties. These include: institutional governance responsibilities like Vice Principal, Dean, Director, Warden, Bursar, School Chairperson, IQAC Coordinator, other membership of institutional committees; membership in profession related committees at state and national level; participation in subject associations, conferences, seminars without paper presentation; participation in short term training courses in educational technology, curriculum development, professional development, examination reforms, institutional governance; membership of professional association committees, board of studies, editorial committees of journal/ institutional publications. The maximum scores for these activities are given in table in category II B.

d. *Contribution in journals and published conferences proceedings*: Research and development related activities are also become an important part of career development of faculties. For Group A, research paper published in refereed journals with impact factor 1.0 and below 2.0 has 20 points per publication; refereed journals with impact factor 2.1 and below 5.0 has 30 points per publication; refereed journals with impact factor 5.1 and below 10.0 has 40 points per publication; refereed journals with impact factor less than one indexed has 15 points per publication; vernacular & Indian language journals without impact factor and national level research papers in non-refereed journals having ISBN/ ISSN numbers included in the list of journals prepared by UGC and hosted in its website have 10 points per publication; while full papers (not abstract) in conference proceedings have 10 points per publication.
For Group B, research papers published in refereed journals which are indexed publications with impact factor less than one has 20 points per publication; refereed journals with impact factor 1.0 and below 2.0 has 30 points per publication; refereed journals with impact factor 2.1 and below 5.0 has 40 points per publication; refereed journals which are not indexed without any impact factor has 15 points per publication; vernacular & Indian language journals without impact factor and national level research papers in non-refereed journals having ISBN/ ISSN numbers included in the list of journals prepared by UGC and hosted in

its website have 10 points per publication; while full papers (not abstract) in conference proceedings have 10 points per publication.

e. ***Research publications (books, chapters in books, other than refereed journals articles)***: Research publications in books and their chapters, other medium of communication channels are also important for evaluation of performance and have common criteria for both the faculty groups. The books published by international publishers with an established peer review system have 50 points for sole author and 10 points per chapter in edited book; likewise subject books published by national level publishers or state and central government publications with ISBN / ISSN numbers and included in UGC prepared list hosted in its website have 25 points for sole author and 5 per chapter in edited books; subject books published by other local publishers with ISBN / ISSN numbers and included in UGC prepared list hosted in its website have 15 points for sole author and 3 per chapter in edited books; chapters contributed to edited knowledge based volumes of international publications have 10 point per chapter while national publications with ISBN / ISSN numbers and numbers of national and international directories have 5 point per chapter.

f. ***Research projects***: There are many types of research projects run by faculties. These projects are called major or minor projects. Major sponsored projects carried out with grants above 30.0 lakhs for group A and above 5.0 lakhs for group B have 20 point per each project while with grants above 5.0 lakhs upto 30.0 lakhs for group A and above 4.0 lakhs upto 5.0 lakhs for group B have 15 point per each project; consultancy projects running / ongoing having amount mobilized with minimum of Rs. 5.00 lac for group A and Rs. 1.00 lac for group B have 10 point per every minimum mobilized amount; completed projects for which project reports get acceptance from funding agency after quality evaluation have 20 points per each major project and 10 points per each minor project; Project outcomes / outputs are obtained in the form of patent, technology transfer, product, process etc in case of Group A, and policy documents of central and state level government bodies in case of Group B. These outcomes / outputs have 30 point per each outcome / output for national patents etc and 50 point per each for international patents etc.

g. ***Research guidance***: Faculties who are supervisor and provided research guidance to M. Phil. and Ph. D. candidates, gets weightage point. There are 3 points per candidate for M. Phil. degree awarded; 10 per candidate for Ph. D. degree awarded; and 7 per candidate for Ph. D. thesis submitted. These are same for both the faculty groups.

h. ***Training courses and conferences/ seminar/ workshops papers***: Participation and organization of Refresher Courses, Conferences, Seminars, and Workshops etc. have made part of performance indicators. Research methodology courses (not less than three weeks)/ workshops (not less than one week) have 20 points each. Participation and paper presentation of research papers (oral/ poster) in international conference have 10 points each; in national conference have 7.5 points each; in regional/ state level conference have 5 points each; and in local university/ college level conference have 3 points each. Invitations for conferences/ seminars/ workshops/ symposia to deliver lectures and/ or chair sessions have 10 points per each at international level; 7.5 points per each at national level; 5 points per each at state level/ regional; 5 points per each at university/ college level endowment lectures.

i. ***Awards/ Honours/ Recognitions/ Fellowship titles/ Post-doctoral research degrees like D. Sc., D. Litt. LLB etc***: Faculties received awards, honors, recognitions at various levels. Discipline specific awards for group A by Accredited International bodies, National bodies like UGC, CSIR, DST, DBT, ICAR and other government bodies and professional academies like Bhatnagar award etc and for group B by Accredited International bodies, National bodies like UGC, ICSSR, ICCR, Sahitya academy and professional academies like Gnana-peet award etc have 50 points per each; at state/ university level 20 points per each and at regional/ local level 10 points per each. Honours/ recognitions by governments and international bodies like UNESCO etc, national like Padma Sri etc. have 50 points per each; by state level/ university level have 20 points per each; regional/ local by GO/ NGOs/ Rotary/ Lions etc have 5 points per each; and by professional subject based associations have 5 points per each. These are same for both the faculty groups. Fellowship titles for group A given by universities/ bodies like FRCP, FRCS etc; Indian science and other academies like fellow of Indian National Science Academy, FNA, FNASC, FAMS etc and for group B given by foreign universities/ bodies like Trinity title etc; Indian Academies of Languages, Arts, etc have 50 points per each. Fellowship titles given by discipline specific national level associations have 10 points per each. Post-doctoral degrees like D. Sc. D. Litt. from an university based on post-doctoral thesis have 50 points each. Honorary doctorates conferred by UGC – recognized universities have 30 points per each.

j. ***Joint publications***: The points for joint research publications/ joint book/ chapter publications have to be calculated in the following manner: of the total accrued score for all categories of publications by the concerned teacher, the first/ principal author and the corresponding author/ supervisor/ mentor of the teacher would share equally 60% of the

total points and the remaining 40% would be shared equally by all other authors.

All the above said performance indicator activities are evaluated and assessed by faculty attendance and Performance Appraisal Scoring System. This system is designed and conducted by the university / college / institutions annually. Universities should develop weightage formula for evaluation of teaching and academic performance of faculties in the form of scoring system which is convertible into percentage out of total credit points.

The following table shows various academic performance indicators of research and development related activities and their weightage points required to develop performance appraisal scoring system.

Table 1: Academic performance indicators of research and development related activities with their weightage points.

S. No.	Nature of Activity	Maximum Score
Category I: Teaching, Learning and Evaluation related Activities		
Category I (A)	**ESSENTIAL**	
1	Lectures taken as percentage of lectures allocated	20
2	Seminars, tutorials, practicals, contact hours undertaken as percentage of those actual allocated	20
3	Lectures or other teaching duties in excess of UGC norms	10
4	Imparting of knowledge/ instruction with the prescribed material and methodology of the curriculum	20
5	College/ University examination duties (Question paper setting and evaluation of answer scripts) as per duties allotted	10
6	College/ University examination/ evaluation duties for internal/ continuous assessment work as allotted	10
7	Additional examination work such as coordination, invigilation, flying squad duties etc. (maximum of 5 or 10 depending upon intensity of duty)	10
Category I (B)	**DESIRABLE**	
1	Use of innovative teaching-learning methodologies; use of ICT; updated subject content and course improvement	10
2	Developing and imparting remedial/ bridge courses and counseling modules	10
3	Developing and imparting soft skills/ communication skills/ personality development courses/ modules	10
4	Developing and imparting specialized teaching-learning programmes in physical education, library; innovative compositions and creations in music, performing and visual arts and other traditional areas	10
5	Organizing and conduction of popularization programmes/ training courses in computer assisted teaching/ web-based learning and other participatory learning skills to students	10

Category II: Co-curricular, Extension and Profession related Activities		
Category II (A)	**Co-curricular and extension activities**	
1	Contribution to Corporate life in Universities/ colleges through meetings, popular lectures, subject related events, articles in college magazine and university volumes	10
2	Institutional co-curricular activities for students such as fields studies/ educational tours, industry-implant training and placement activity	10
3	Community service, social orientation and other student mentoring activities through NSS/ NCC/ NSO/ other governmental and non-governmental channels	10
4	Students and staff related socio-cultural and sport programmes (intra/ interdepartmental and intercollegiate)	05
5	Professional ethics and campus development activities like institutional infrastructure projects, co-curricular student educational programme like environmental education etc. and value based programmes, and programmes in the TV/ Radio channels	05
Category II (B)	**Profession related contribution**	
1	Institutional governance responsibilities like Vice Principal, Dean, Director, Warden, Bursar, School cheir person, IQAC coordinator and any other membership of institutional committees	10
2	Membership in profession related committees at state and national level	10
3	Participation in subject associations, conferences, seminars without paper presentation	05
4	Participation in short term training courses less than one week duration in educational technology, curriculum development, professional development, examination reforms, institutional governance	05
5	Membership of professional associations committees, boards of studies, editorial committees of journals/ institutional publications	05

Category III : Research and academic contributions				
S. No.	APIs	Engineering/ Agriculture/ Veterinary Science/ Sciences/ Medical Sciences	Faculties of Languages/ Arts/ Humanities/ Social Sciences/ Library/ Physical education/ Management	Max. points for university/ college teacher position
III (A)	Research Publication (Journals)	Refereed Journals with impact factor 1.0 and below 2.0	Refereed Journals which are indexed publications with Impact factor less than one	20 / publication
		Refereed Journals with impact factor 2.1 and below 5.0	Refereed Journals with impact factor 1.0 and below 2.0	30 / publication
		Refereed Journals with impact factor 5.1 and below 10.0	Refereed Journals with impact factor 2.0 and below 5.0	40 / publication

		Refereed Journals with impact factor less than one indexed	Refereed Journals which are not indexed without any impact factor	15 / publication
		Vernacular & Indian language journals in all disciplines without any impact factors included in the list of journals prepared by UGC and hosted in its website	Vernacular & Indian language journals in all disciplines without any impact factors included in the list of journals prepared by UGC and hosted in its website	10 / publication
		Non impact factor National level research papers in non-referred journals but having ISBN/ ISSN numbers and the list of journals prepared by UGC and hosted in its website.	National level research papers in non-referred/ non journals but having ISBN/ ISSN numbers and the list of journals prepared by UGC and hosted in its website.	10 / publication
		Full paper in conference proceedings etc (Abstracts not to be included)	Full paper in conference proceedings etc (Abstracts not to be included)	10 / publication
III (B)	Research publications (books, chapters in books, other than refereed journal articles)	Text or Reference Books published by International publishers with an established peer review system	Text or Reference Books published by International publishers	50 / sole author; 10 / chapter in an edited book
		Subject books by National level publishers/ state and central govt. publications with ISBN/ ISSN numbers and the UGC prepared list hosted in its website	Subject books by National level publishers/ state and central govt. publications with ISBN/ ISSN numbers and the UGC prepared list hosted in its website	25 / sole author, and 5 / chapter in edited books
		Subject books by Other local publishers with ISBN/ ISSN numbers and the UGC prepared list hosted in its website	Subject books by Other local publishers with ISBN/ ISSN numbers and the UGC prepared list hosted in its website	15 / sole author, and 3 / chapter in edited books
		Chapters Contributed to edited knowledge based volumes	Chapters Contributed to edited knowledge based volumes	10 / chapter

		published by international publishers	published by international publishers	
		Chapters in knowledge based volumes by Indian/ National level publisher with ISBN/ ISSN numbers & with numbers of national & international directories	Chapters in knowledge based volumes by Indian/ National level publisher with ISBN/ ISSN numbers & with numbers of national & international directories	5 / chapter
III (C)	**Research Projects**			
III (C)(i)	Sponsored projects carried out/ ongoing	(a) Major projects amount mobilized with grants above 30.0 lakhs	(a) Major projects amount mobilized with grants above 5.0 lakhs	20 / each project
		(b) Major projects amount mobilized with grants above 5.0 lakhs up to 30.0 lakhs	(b) Major projects amount mobilized with minimum of Rs. 4.00 lac up to Rs. 5.00 lacs	15 / each major project
III (C)(ii)	Consultancy projects carried out/ ongoing	Amount mobilized with minimum of Rs. 5.00 lac	Amount mobilized with minimum of Rs. 1 lac	10 per every Rs. 5.0 lac and Rs. 1.0 lac, respectively
III (C)(iii)	Completed projects: Quality evaluation	Completed project report (acceptance from funding agency)	Completed project report (accepted by funding agency)	20 / each major project and 10 / each minor project
III (C)(iv)	Projects outcome/ outputs	Patent/ Technology transfer/ Product/ Process	Policy document of Govt. bodies at central and state level	30 / each output or outcome for National patents etc 50 / each for international patents etc
III (D)	**Research Guidance**			
III (D)(i)	M. Phil.	Degree awarded only	Degree awarded only	3 / each candidate
III (D)(ii)	Ph. D.	Degree awarded	Degree awarded	10 / each candidate
		Thesis submitted	Thesis submitted	7 / each candidate
III (E)	**Training courses and Conference/ Seminar/ Workshop Papers**			
III (E)(i)	Research Methodology/ Workshops	Research Methodology course (not less than three weeks)/ workshops of not less than one week	Research Methodology course (not less than three weeks)/ workshops of not less than one week	20

		duration		
III (E)(ii)	Papers in Conferences/ Seminars/ workshops etc*	Participation and presentation of research papers (oral/ posters) in	Participation and presentation of research papers (oral/ posters) in	
		a) International conference	a) International conference	10 / each
		b) National	b) National	7.5 / each
		c) Regional/ State level	c) Regional/ State level	5 / each
		d) Local – university/ college level	d) Local – university/ college level	3 / each
III (E)(iii)	Invitations for conferences/ seminars/ workshops/ symposia to deliver lectures and/ or chair sessions	(a) International	(a) International	10 / each
		(b) National	(b) National	7.5 / each
		(c) State level/ Regional	(c) State level/ Regional	5 / each
		(d) University/ College level Endowment lectures	(d) University/ College level Endowment lectures	5 / each
III (F)	**Awards/ Honors/ Recognitions/ Fellowship titles/ Post-Doctoral research degrees like D. Sc., D. Litt., LLB etc.**			
III (F)(i)	Discipline specific Awards	a) Awards by Accredited International bodies; National bodies like by UGC, CSIR, DST, DBT, ICAR & other government bodies and professional Academies like Bhatnagar Award etc.	a) Awards by Accredited International bodies; National bodies like by UGC, ICSSR, ICCR, Sahitya Academy and professional Academies like Gyan-Peet Award etc.	50 / each
		b) State/ University level	b) State/ University level	20 / each
		c) Regional/ Local	c) Regional/ Local	10 / each
III (F)(ii)	Honours/ Recognitions	a) Governments & International bodies like UNESCO etc; National like Padma Sri etc	a) Foreign countries Governments & International bodies like UNESCO etc; National like Padma Sri etc	50 / each
		b) State level/ University level	b) State level/ University level	20 / each
		c) Regional/ local by GO/ NGOs/ Rotary/ Lions etc	c) Regional/ local by GO/ NGOs/ Rotary/ Lions etc	5 / each
		d) Professional Subject based	d) Professional Subject based	5 / each

		associations	associations	
III (F)(iii)	Fellowship Titles	a) By universities/ bodies like FRCP, FRCS etc; Indian science and other academies like Fellow of Indian National Science Academy FNA, FNASC, FAMS etc.	a) Foreign universities/ bodies like Trinity title etc; Indian Academies of Languages, Arts etc.	50 / each
		b) Discipline specific National level Associations	b) Discipline specific National level Associations	10 / each
III (F)(iv)	Post-doctoral degrees	a) D. Sc. from an university based on post-doctoral thesis	a) D. Litt from an university based on post-doctoral thesis	10 / each
		b) Honorary doctorate conferred by UGC-recognized universities in sciences, engineering, medicine etc.	b) Honorary doctorate conferred by UGC-recognized universities in language, arts, humanities etc.	30 / each

* If a paper presented in conference/ seminar is published in the form of proceedings, the points would accrue for the publication (III(a)) and not under presentation (III(e)(ii)).

2 *Minimum Academic Performance and Service Requirements for CAS Promotions*:

UGC has following rules and regulations for CAS promotions of Faculties. These regulations show Minimum Academic Performance and Service Requirements. Universities and colleges under the potential for Excellence category etc. can prescribe levels of these indicators over and above the minimum requirements to maintain high standard of teaching and research.

A. *Asst. Professor AGP one to AGP two*: For the promotion of Assistant Professor from AGP Rs. 6000 to AGP Rs. 7000 or equivalent cadre, Assistant Professor have to completed 4 years of service with Ph. D. or 5 years of service with M. Phil. / PG degree in Professional courses or 6 years of service who are without Ph. D./ M. Phil./ PG degree in Professional courses. They require minimum API scores using PBAS scoring proforma developed by the concerned university as per the norms provided in the table 2 for teachers in university departments/ equivalent cadres and in table 3 for teachers/ equivalent cadres in colleges. They also require participation in one orientation and one refresher / research methodology course of 2-3 weeks duration.

B. ***Asst. Professor AGP two to AGP three***: For the promotion of Assistant Professor from AGP Rs. 7000 to AGP Rs. 8000 or equivalent cadre Assistant Professor have completed 5 years of service at AGP of Rs. 7000. They require minimum API scores using PBAS scoring proforma developed by the concerned university as per the norms provided in the table 2 for teachers in university departments/ equivalent cadres and in table 3 for teachers/ equivalent cadres in colleges. They also require participation in two courses/ programmes from among the refresher courses, workshops, training,· teaching-learning-evaluation technology programmes, soft skills development programmes and faculty development programmes for a minimum period of one week duration to have been undergone during the assessment period.

C. ***Asst. Professor to Asso. Professor***: For the promotion of Assistant Professor to Associate Professor with AGP Rs. 9000 or equivalent cadre, Assistant Professor has completed 3 years of service at AGP of Rs. 8000. They require minimum API scores using PBAS scoring proforma developed by the concerned university as per the norms provided in the table 2 for teachers in university departments/ equivalent cadres and in table 3 for teachers/ equivalent cadres in colleges. They require minimum of three publications. They also require participation in one course/ training under the professional development/ curriculum development/ examination reform programs for a minimum period of three days. A selection committee process is also required as stipulated in this regulation.

D. ***Asso. Professor to Professor:*** For the promotion of Associate Professor to Professor with AGP Rs. 10000 or equivalent cadre, Associate Professor has completed 3 years of service at AGP of Rs. 9000. They require minimum API scores using PBAS scoring proforma developed by the concerned university as per the norms provided in the table 2 for teachers in university departments/ equivalent cadres and in table 3 for teachers/ equivalent cadres in colleges. They require minimum of five publications. A selection committee process is also required as stipulated in this regulation.

E. ***Professor AGP one to AGP two***: For the promotion of Professor from AGP Rs. 10000 to AGP Rs. 12000 or equivalent cadre Professor have completed 10 years of service at AGP of Rs. 10000. They require minimum API scores using PBAS scoring proforma developed by the concerned university as per the norms provided in the table 2 for teachers in university departments/ equivalent cadres and in table 3 for teachers/ equivalent cadres in colleges. This AGP elevation for professor is applicable to only university departments, additional credentials are to be evidenced by post-doctoral research outputs of high standard; Awards,

Honors, Recognitions, patents and IPR on products and processes developed/ technology transfer achieved; and Additional research degrees like D. Sc., D. Litt., LLB etc. the selection process is to be conducted by the university through an expert committee evaluation of all credentials submitted along with dully filled PBAS proforma by eligible professor as stipulated.

3 *Scoring distribution between various activities and grades of Faculties*:

The above table 1 shows the maximum scores for each and every teaching, research and other profession related activities which can be used for calculating the performance based score of the faculties. The minimum points necessary obtained from each activity are also important to know for balancing the total scores and their weightage for expert assessment under career advancement scheme. The minimum requirement of points from various Academic Performance Indicators according to their weightage points is shown in table 2 for university teachers and table 3 for college teachers. The minimum points of the Academic Performance Indicators tobe applied for the direct recruitment of teachers in university department/ colleges according to their weightage points are shown in table 4 which are considered along with other specified eligibility qualifications stipulated in the UGC notification. The following tables show the minimum point norms of the academic performance indicators.

Table 2: Minimum point norms of the APIs to be applied for the promotion of teachers in university departments, and Weightage for expert assessment under career advancement scheme (CAS).

S. No.	Assessment category/ system	Minimum average yearly or cumulative API score required during the assessment period of each level as evaluated under the performance based appraisal system (PBAS) and weightage for expert assessment				
		Teachers in University Departments/ Equivalent cadres in Universities				
		Assistant Professor/ equivalent cadres: AGP increase from Rs. 6000 to 7000	Assistant Professor/ equivalent cadres: AGP increase from Rs. 7000 to 8000	Associate Professor/ equivalent cadres: promotion with AGP of Rs. 9000	Professor/ equivalent cadres: promotion with AGP of Rs. 10000	Professor with AGP increase from Rs. 10000 to 12000
I	Category I	60 / year	60 / year	60 / year	60 / year	60 / year
II	Category II	20 / year	20 / year	20 / year	20 / year	20 / year
III	Minimum total	100 / year	100 / year	100 / year	100 / year	100 / year

	average annual score under categories I & II					
IV	Category III	10 / year (40 / assessment period)	20 / year (100 / assessment period)	30 / year (90 / assessment period)	40 / year (120 / assessment period)	50 / year (500 / assessment period)
	Expert assessment system	Screening Committee	Screening Committee	Selection Committee	Selection Committee	Peer evaluation
V	Percentage distribution of weightage points in the expert assessment	No separate points. Screening committee to verify API scores	No separate points. Screening committee to verify API scores	30% - Research evaluation. 50% - Assessment of domain knowledge and teaching practices. 20% Interview performance	50% - Research evaluation. 30% - Assessment of domain knowledge and teaching practices. 20% Interview performance	50% - Peer evaluation of research. 50% - Performance evaluation and other credential by referral procedure

Table 3: Minimum point norms of the APIs to be applied for the promotion of teachers in colleges (UG and PG), and Weightage for expert assessment under career advancement scheme (CAS).

S. No.	Assessment category	Minimum average yearly or cumulative API score required during the assessment period of each level as evaluated under the performance based appraisal system (PBAS) and weightage for expert assessment			
		College (UG/PG) Teachers/ College Library/ Physical Education Cadres			
		Assistant Professor/ equivalent cadres: AGP increase from Rs. 6000 to 7000	Assistant Professor/ equivalent cadres: AGP increase from Rs. 7000 to 8000	Associate Professor/ equivalent cadres: promotion with AGP of Rs. 9000	10 % of the posts of Professor promotion in colleges with AGP of Rs. 10000
I	Category I	60 / year	60 / year	60 / year	60 / year
II	Category II	20 / year	20 / year	20 / year	20 / year
III	Minimum **total** average annual score under	100 / year	100 / year	100 / year	100 / year

	categories I & II				
IV	Category III	5 / year (20 / assessment period)	10 / year (50 / assessment period)	15 / year (45 / assessment period)	20 / year (60 / assessment period)
	Expert assessment system	Screening Committee	Screening Committee	Selection Committee	Selection Committee
V	Percentage distribution of weightage points in the expert assessment	No separate points. Screening committee to verify API scores	No separate points. Screening committee to verify API scores	20% - Research evaluation. 60% - Assessment of domain knowledge and teaching practices. 20% Interview performance	30% - Research evaluation. 50% - Assessment of domain knowledge and teaching practices. 20% Interview performance

Table 4: Minimum point norms of the APIs to be applied for the direct recruitment of teachers in university departments/ colleges, Librarian/ Physical education cadres in universities/ colleges to be considered along with other specified eligibility qualifications stipulated in the UGC Notification.

S. No.	Assessment category of APIs	Minimum cumulative WP of the API score required for considering candidates for selection to each cadre based on the PBAS proforma to be submitted by the applicants along with the stipulated application of the university/ college concerned.		
		Teachers in University departments/ equivalent cadres/ Colleges.		
		Assistant Professor/ equivalent cadres with AGP Rs. 6000	Associate Professor/ equivalent cadres with AGP Rs. 9000	Professor/ equivalent cadres with AGP Rs. 10000
I	Expertise in Teaching/Research/ Industry & Enteurpreneurship skills and contribution to corporate life & profession related activities (200 points)	Consolidated API score requirement of 100 from all the three categories of APIs or Pass in NET/ accredited Eligibility test approved by UGC	Consolidated API score requirement of 300 points from all the three categories of APIs	Consolidated API score requirement of 400 points from all the three categories of APIs
II	Research, Development and other related activities (200 points)			
III	Extension, co-curricular			

	extracurricular & student mentoring activities (100 points)			
IV	Selection committee criteria: (Minimum point requirement for consideration for selection: at least 50% of the points prescribed)	Highest of the 30 merit points under a) Teaching skills by a Lecture (10 points) b) Research skills by a concept/ proposal presentation (5 points) c) Interview performance (15 points)	Highest of the 50 merit points under a) Research papers (3 nos) evaluation: 25 points b) Organizational Plans: 10 points c) Interview performance: 15 points	Highest of the 75 merit points under a) Research papers (5 nos) evaluation: 40 points b) Vision for the department/ Institution: 15 points c) Interview performance: 20 points

The above tables show that during initial service as Asst. Professor, faculties should be more devoted to teaching and related activities. As they grow in their career they tend to research and related activities and more and more research publications are come into existence.

INDIAN COUNCIL OF AGRICULTURAL RESEARCH (ICAR)

Indian Council of Agricultural Research is a council established to regulate research and developmental activities in various agricultural research centers, universities, colleges and krishi vigyan kendra [7]. The Agricultural Scientist's Recruitment Board is an independent recruiting agency setup with the approval of the cabinet [8]. It is responsible for recruitment of posts in the agricultural research service, research management positions and to such other posts and services as the President of Indian Council of Agricultural Research (ICAR) desires. It also screens scientists of ICAR for promotion under the Career Advancement Scheme. ICAR approved revised guidelines for evaluation of scientists for promotion from Scientist to Scientist (Sr. Scale) and from Scientist (Sr. Scale) to Sr. Scientist under career advancement scheme [9].

Various scoring activities and their marks for assessment of scientist for promotion to Scientist (Sr. Scale):

Research projects have 10 marks each. The project is score only once during its tenure. Institutionally mandated activities allotted, training, extension etc have one mark for each assignment per year. Technological developments, prototype, genetic stock, variety, product, vaccine, diagnostic kit, process, concept, methodology all have 2.5 marks for each. Confidential reports have different marks for performance of Ph. D, holders and M. Sc. holders. For Ph. D. holders 7.5 marks for

outstanding, 6.0 for very good, 4.5 for good, 3.0 for average and 1.5 for below average performance allotted per year while for M. Sc. holders 5 marks for outstanding, 4 for very good, 3 for good, 2 for average and 1 for below average performance allotted per year. Research papers (published during the period of review) are being allocated scores according to the NAAS rating of journals on scale of 0.5 to 4.0 and totaled and multiplied by factor 2.0. Only three papers are scored for scientists with 75% research while two papers are scored for scientists with 50% research and teaching and/or extension. Other publications like research notes, technical articles, popular articles each has 1 mark. Some scientists are also engaged in teaching and/ or extension activities. Each course has 3 marks for teaching in a trimester and 5 marks for teaching in a semester. Help in preparation of teaching manuals, instructional materials etc have 1 mark for each assignment. Extension works like field day/ farmers fair, demonstration, exhibition etc have 2 marks for each. Lectures given in training programs has 2 marks for each. Technology assessment and refinement through participatory extension has 2 marks for each.

Table 5: Guidelines for preparation of score cards for career advancement of ICAR scientists from scientists to scientists (Sr. Scale)

S. No.	**Evaluation of scientists who are principally engaged in research work only**	Max. Score
A	Scientist's Achievements in Research	50
A01	Research projects 10 marks for each (Each project will score only once during its tenure).	30
A02	Institutionally mandated activities allotted/ Training/ Extension/ Services provided as per institute mandate/ Teaching (1 mark for each assignment per year).	15
A03	Technologies developed, participatory technology development, prototype, genetic stock, variety, product, vaccine, diagnostic kit, process, concept, methodology (2.5 marks for each).	5
B	Confidential reports	30
B01	a) For Ph. D. holders: 7.5 marks for Outstanding, 6.0 marks for Very Good, 4.5 marks for Good, 3.0 marks for Average, 1.5 marks for below Average. b) For M. Sc. holders: 5 marks for Outstanding, 4 marks for Very Good, 3 marks for Good, 2 marks for Average, 1 marks for below Average. (Grading to be awarded for each year)	
C	Publications	20
C01	Three research papers published during the period of review will be allocated score according to the NAAS	18

	rating of scientific journals on a scale of 0.5 to 4.0 and totaled and multiplied by a factor of 2.0	
C02	Other publications: 1 mark for each research note/ technical article/ Extension bulletin/ popular article	2
	TOTAL	**100**
S. No.	**Evaluation of scientists who are engaged in research work as well as teaching/ training OR Extension work**	**Max. Score**
A	Scientist's Achievements in Research	35
A01	Research projects 10 marks for each (Each project will score only once during its tenure).	20
A02	Institutionally mandated activities allotted/ Services provided as per institute mandate (1 mark for each assignment per year).	10
A03	Technologies developed, participatory technology development, prototype, genetic stock, variety, product, vaccine, diagnostic kit, process, concept, methodology (2.5 marks for each).	5
B	Scientist's Achievements in Teaching/ Training	20
B01	Courses taught 3 marks for each course in a trimester and 5 marks for each course in a semester	15
B02	Help in preparation of teaching manuals/ instructional material etc. (1 mark for each assignment)	5
OR		OR
B	Scientist's Achievements in Extension	20
B01	Field day/ farmers fair, demonstration, exhibitions etc 2 marks for each	8
B02	Lectures given in training programmes 2 marks for each	8
B03	Technology assessment and refinement through participatory extension 2 marks for each	4
C	Confidential reports	30
C01	a) For Ph. D. holders: 7.5 marks for Outstanding, 6.0 marks for Very Good, 4.5 marks for Good, 3.0 marks for Average, 1.5 marks for below Average. b) For M. Sc. holders: 5 marks for Outstanding, 4 marks for Very Good, 3 marks for Good, 2 marks for Average, 1 marks for below Average. (Grading to be awarded for each year)	
D	Publications	15
D01	Two research papers published during the period of review will be allocated score according to the NAAS rating of scientific journals on a scale of 0.5 to 4.0 and totaled and multiplied by a factor of 2.0	12

D02	Other publications: 1 mark for each research note/ technical article/ Extension bulletin/ popular article	3
	TOTAL	**100**
S. No.	**Evaluation of scientists who are engaged in research work as well as teaching/ training AND Extension work**	**Max. Score**
A	Scientist's Achievements in Research	25
A01	Research projects 10 marks for each (Each project will score only once during its tenure).	10
A02	Institutionally mandated activities allotted/ Services provided as per institute mandate (1 mark for each assignment per year).	10
A03	Technologies developed, participatory technology development, prototype, genetic stock, variety, product, vaccine, diagnostic kit, process, concept, methodology (2.5 marks for each).	5
B	Scientist's Achievements in Teaching/ Training	15
B01	Courses taught 3 marks for each course in a trimester and 5 marks for each course in a semester	10
B02	Help in preparation of teaching manuals/ instructional material etc. (1 mark for each assignment)	5
C	Scientist's Achievements in Extension	15
C01	Field day/ farmers fair, demonstration, exhibitions etc 2 marks for each	6
C02	Lectures given in training programmes 2 marks for each	6
C03	Technology assessment and refinement through participatory extension 2 marks for each	3
D	Confidential reports	30
D01	a) For Ph. D. holders: 7.5 marks for Outstanding, 6.0 marks for Very Good, 4.5 marks for Good, 3.0 marks for Average, 1.5 marks for below Average. b) For M. Sc. holders: 5 marks for Outstanding, 4 marks for Very Good, 3 marks for Good, 2 marks for Average, 1 marks for below Average. (Grading to be awarded for each year)	
E	Publications	15
E01	Two research papers published during the period of review will be allocated score according to the NAAS rating of scientific journals on a scale of 0.5 to 4.0 and totaled and multiplied by a factor of 1.5	9
E02	Other publications: 1 mark for each research note/ technical article/ Extension bulletin/ popular article	6
	TOTAL	**100**

Various scoring activities and their marks for assessment of Scientists (Sr. Scale) for promotion to Sr. Scientist:

Research projects have 5 marks for PI and 4 marks for Co-PI. Each project is score only once during its tenure. Institutionally mandated activities allotted/ services provided etc have one mark for each assignment per year. Technological developments, prototype, genetic stock, variety, product, vaccine, diagnostic kit, process, concept, methodology, patents files etc have 3 marks for PI and 2 marks for Co-PI for each. Confidential reports have different marks for performance like 6 marks for outstanding, 5 for very good, 4 for good, 3 for average and 2 for below average performance allotted per year. Research papers (full score for first author and, 0.75 score each for rest of the authors) published during the period of review, are being allocated scores according to the NAAS rating of journals on scale of 0.5 to 4.0 and totaled. Only six best research papers are scored for scientists with 75% research while four research papers are scored for scientists with 50% research and teaching and/or extension. Books authored have 2 mark for first author and 1.5 marks each for co-authors. Edited books/ proceedings have 1 mark for first editor and 0.75 marks each for co-editors. Book chapters/ manuals/ bulletins have 0.5 mark for first author and 0.25 marks each for co-authors. Technical articles have 0.5 mark for first author and 0.25 marks each for co-authors. International and national awards/ fellowships have 2 marks each while institutional or recognized professional societies award/ fellowship have 1 mark each. Best papers and best posters have 0.5 marks each. Convener or co-convener of seminars, symposia, conferences, summer or winter training, refresher courses of duration 1-20 days have 1 mark each while duration of 21days or more have 2 marks each. Some scientists are also engaged in teaching and/ or extension activities. Each course has 3 marks for teaching in a trimester and 5 marks for teaching in a semester. Preparation of teaching manuals, instructional materials etc have 1 mark for each assignment. Extension works like field day/ farmers fair, demonstration, exhibition etc have 2 marks for each. Lectures given in training programs has 2 marks for each. Technology assessment and refinement through participatory extension has 2 marks for each.

Table 6: Guidelines for preparation of score cards for career advancement of ICAR scientists from scientists (Sr. Scale) to Sr. Scientists

S. No.	Evaluation of scientists who are principally engaged in research work only	Max. Score
A	Scientist's Achievements in Research	40
A01	Research projects 5 marks for PI and 4 for Co-PI (Each project will score only once during its tenure).	20

A02	Institutionally mandated activities allotted/ Training/ Extension/ Services provided as per institute mandate/ Teaching (1 mark for each assignment per year).	10
A03	Technologies developed, participatory technology development, prototype, genetic stock, variety, product, vaccine, diagnostic kit, process, concept, methodology, patent filed (3 marks for PI and 2 marks for Co-PI).	10
B	Confidential reports	30
B01	6 marks for Outstanding, 5 marks for Very Good, 4 marks for Good, 3 marks for Average, 2 marks for below Average. (Grading to be awarded for each year)	
C	Publications	25
C01	Six best research papers published during the period of review will be allocated score according to the NAAS rating of scientific journals on a scale of 0.5 to 4.0 and totaled. (Full score for the first author. 0.75 score each for rest of the authors)	18
C02	Books authored: 2 marks for the first author. 1.5 marks each for co-authors. Books/ conference proceeding edited: 1 mark for first editor, 0.75 marks each for coeditors. Book chapters/ manuals/ bulletins: 0.5 marks for the first author, 0.25 marks each for co-authors. Technical articles: 0.5 marks for first author, 0.25 marks each for co-authors.	7
D	Peer Recognition	5
D01	International and National Awards/ Fellowships (Post-Doctoral/ Academics and Societies): 2 marks each. Institutional or recognized professional societies award/ fellowship/ journal editor: 1 mark each Best paper, Best posters 0.5 marks each. (Conference prizes/ medals, office bearers of societies excluded)	
D02	Convener or co-convener of seminars/ symposia/ conference/ summer or winter school/ training programme/ refresher course of duration 7 to 20 days: 1 mark each; 21 days or more: 2 marks each. (workshop/ trainings organized as a part of duty of the post, simple participation, giving of lecture or presentation of paper will not be considered)	
	TOTAL	**100**

S. No.	Evaluation of scientists who are engaged in research work as well as teaching/ training OR extension work	Max. Score
A	Scientist's Achievements in Research	25
A01	Research projects 5 marks for PI and 4 for Co-PI (Each project will score only once during its tenure).	10
A02	Institutionally mandated activities allotted/ Training/ Extension/ Services provided as per institute mandate/ Teaching (1 mark for each assignment per year).	10
A03	Technologies developed, participatory technology development, prototype, genetic stock, variety, product, vaccine, diagnostic kit, process, concept, methodology, patent filed (3 marks for PI and 2 marks for Co-PI).	5
B	Scientist's Achievements in Teaching/ Training	20
B01	Courses taught 3 marks for each course in a trimester and 5 marks for each course in a semester	15
B02	Help in preparation of teaching manuals/ instructional material etc. (1 mark for each assignment)	5
OR		OR
B	Scientist's Achievements in Extension	20
B01	Field day/ farmers fair, demonstration, exhibitions etc 2 marks for each	8
B02	Lectures given in training programmes 2 marks for each	8
B03	Technology assessment and refinement through participatory extension 2 marks for each	4
C	Confidential reports	30
C01	6 marks for Outstanding, 5 marks for Very Good, 4 marks for Good, 3 marks for Average, 2 marks for below Average. (Grading to be awarded for each year)	
D	Publications	20
D01	Four best research papers published during the period of review will be allocated score according to the NAAS rating of scientific journals on a scale of 0.5 to 4.0 and totaled.	12
D02	Books authored: 2 marks for the first author. 1.5 marks each for co-authors. Books/ conference proceeding edited: 1 mark for first editor, 0.75 marks each for coeditors. Book chapters/ manuals/ bulletins: 0.5 marks for the first author, 0.25 marks each for co-authors.	8

	Technical articles: 0.5 marks for first author, 0.25 marks each for co-authors.	
E	Peer Recognition	5
E01	International and National Awards/ Fellowships (Post-Doctoral/ Academies and Societies): 2 marks each. Institutional or recognized professional societies award/ fellowship/ journal editor: 1 mark each Best paper, Best posters 0.5 marks each. (Conference prizes/ medals, office bearers of societies excluded)	
E02	Convener or co-convener of seminars/ symposia/ conference/ summer or winter school/ training programme/ refresher course of duration 7 to 20 days: 1 mark each; 21 days or more: 2 marks each. (workshop/ trainings organized as a part of duty of the post, simple participation, giving of lecture or presentation of paper will not be considered)	
	TOTAL	**100**
S. No.	**Evaluation of scientists who are engaged in research work as well as teaching/ training AND extension work**	**Max. Score**
A	Scientist's Achievements in Research	20
A01	Research projects 5 marks for PI and 4 for Co-PI (Each project will score only once during its tenure).	10
A02	Institutionally mandated activities allotted/ Services provided as per institute mandate/ Teaching (1 mark for each assignment per year).	5
A03	Technologies developed, participatory technology development, prototype, genetic stock, variety, product, vaccine, diagnostic kit, process, concept, methodology, patent filed (3 marks for PI and 2 marks for Co-PI).	5
B	Scientist's Achievements in Teaching/ Training	10
B01	Courses taught 3 marks for each course in a trimester and 5 marks for each course in a semester	5
B02	Help in preparation of teaching manuals/ instructional material etc. (1 mark for each assignment)	5
C	Scientist's Achievements in Extension	15
C01	Field day/ farmers fair, demonstration, exhibitions etc 2 marks for each	6
C02	Lectures given in training programmes 2 marks for each	6
C03	Technology assessment and refinement through	3

	participatory extension 2 marks for each	
D	Confidential reports	30
D01	6 marks for Outstanding, 5 marks for Very Good, 4 marks for Good, 3 marks for Average, 2 marks for below Average. (Grading to be awarded for each year)	
E	Publications	20
E01	Four best research papers published during the period of review will be allocated score according to the NAAS rating of scientific journals on a scale of 0.5 to 4.0 and totaled.	12
E02	Books authored: 2 marks for the first author. 1.5 marks each for co-authors. Books/ conference proceeding edited: 1 mark for first editor, 0.75 marks each for coeditors. Book chapters/ manuals/ bulletins: 0.5 marks for the first author, 0.25 marks each for co-authors. Technical articles: 0.5 marks for first author, 0.25 marks each for co-authors.	8
F	Peer Recognition	5
F01	International and National Awards/ Fellowships (Post-Doctoral/ Academies and Societies): 2 marks each. Institutional or recognized professional societies award/ fellowship/ journal editor: 1 mark each Best paper, Best posters 0.5 marks each. (Conference prizes/ medals, office bearers of societies excluded)	
F02	Convener or co-convener of seminars/ symposia/ conference/ summer or winter school/ training programme/ refresher course of duration 7 to 20 days: 1 mark each; 21 days or more: 2 marks each. (workshop/ trainings organized as a part of duty of the post, simple participation, giving of lecture or presentation of paper will not be considered)	
	TOTAL	**100**

Maximum scores requirements:

For the promotion of Scientists to Scientists (Senior Scale) and from Scientists (Senior Scale) to Senior Scientists, the scientists have to get scores from various activities discussed above. For each grade and category of scientists the maximum score which they can obtain is shown in following table. Also contribution of each achievement in promotion is shown in graph.

Table 7: Maximum scores requirements for promotion of Scientists in ICAR

	Scientist with 75% Research S1	Scientist with 50% Research and Teaching OR Extension S2	Scientist with 50% Research and Teaching AND Extension S3	Scientist (SS) with 75% Research SS1	Scientist(SS) with 50% Research and Teaching OR Extension SS2	Scientist(SS) with 50% Research and Teaching AND Extension SS3
Achievements in Research	50	35	25	40	25	20
Confidential Reports	30	30	30	30	30	30
Publications	20	15	15	25	20	20
Achievements in Teaching	0	20	15	0	20	10
Achievements in Extension	0	0	15	0	0	15
Peer Recognition	0	0	0	5	5	5
	100	100	100	100	100	100

. The promotion scheme of ICAR Scientists shows that the research projects, publications and project outcomes / outputs contribute maximum scores for performance appraisal of Scientists. The scientists are expected to devoted more and more on research activities and develop new technologies, variety, diagnostic tools, quality improvements, patents etc.

COMPARISON BETWEEN UGC PERFORMANCE *APPRAISAL* SYSTEM AND ICAR GUIDELINES FOR EVALUATION

The basic theme of the paper is presenting a comparative analysis of the promotion scheme of UGC and ICAR by comparing their evaluation method and criteria. UGC applied the academic performance indicators and their weightage points for preparing performance appraisal scoring system and allow the universities to develop weightage formula for evaluation. ICAR presents revised guidelines for assessment and evaluation of scientists for promotion under career advancement scheme. The following table presents a comparative analysis of both the evaluation system based on various teaching activities, research activities and other related activities.

Table 8: Comparison of UGC and ICAR guidelines

S. No.	UGC	ICAR
1	UGC (university grant commission) is a funding and regulatory board established under the control of Ministry of Human Resource Development.	ICAR (Indian council of agriculture research) is too a regulatory body established under the control of Ministry of Agriculture.
2	Central universities, state universities, deemed universities, colleges and some institutions are regulated by UGC.	National research centers for various crops, agricultural research stations, agriculture universities, colleges are regulated by ICAR.
3	UGC proposed the guidelines of performance appraisal scoring system for promotion from Asst. Professor AGP 1 to 2 and 2 to 3, from Asst. Professor AGP 3 to Asso. Professor, from Asso. Professor to Professor AGP 1 and from Professor AGP 1 to 2.	ICAR presents guidelines for evaluation of scientists for promotion from Scientist to Scientist (Sr. Scale) and from Scientist (Sr. Scale) to Sr. Scientist.
4	Teaching and related activities are divided into essential activities (100 points) and desirable activities (50 points).	Teaching activities have 10 – 20 marks for different group of scientists which contributes 10 to 20 % of total score card.
5	Essential teaching activities include lectures taken as % of allocated; tutorials, seminars, practicals, contact hours undertaken as % of allocated; imparting of knowledge with the prescribed material and methodology of the curriculum; examination duties (question paper setting, answer sheet evaluation) and internal/ continuous assessment. Desirable activities includes use of innovative teaching-learning methodologies, ICT materials, updated subject content and course improvement; developing and imparting remedial/ bridge course, counseling, soft skills, communication skills, personality development, specialized teaching-learning programs in physical education, library; innovative compositions and creations in music, performing and visual arts; organizing and conduction of popularization program/ training course, web-based learning etc.	There is no division of teaching activities is found. Teaching activities includes classroom teaching for semester and help in preparation of teaching manuals and instructional materials only. Classroom teaching has 3 - 5 marks per course per semester, but the total marks do not exceed 15 during the review period. Preparation of manuals and materials has 1 mark for each assignment but total marks do not exceed 5.
6	There is no necessity of confidential reports shown in proposed guidelines.	There are maximum 30 marks given to confidential report which has categories like outstanding, very good, good, average and below average.
7	There are many categories are derived	For promotion from Scientist to

	for evaluation of research publications in journals. Group A – a) Refereed journals with impact factor 1.0 and below 2.0 (20/ publication), b) Refereed journals with impact factor 2.1 and below 5.0 (30/ publication), c) Refereed journals with impact factor 5.1 and below 10 (40/ publication), d) Refereed journals with impact factor less than one indexed (15/ publication). e) vernacular and Indian language journals without impact factor (10/ publication), f) Non-refereed journals having ISBN/ ISSN numbers (10/ publication), and g) Full paper in conference proceedings (10/ publication). Group B – a) Refereed journals with impact factor less than one indexed (20/ publication). b) Refereed journals with impact factor 1.0 and below 2.0 (30/ publication), c) Refereed journals with impact factor 2.1 and below 5.0 (40/ publication), d) Refereed journals without impact factor not indexed (15/ publication), e) vernacular and Indian language journals without impact factor (10/ publication), f) Non-refereed journals having ISBN/ ISSN numbers (10/ publication), and g) Full paper in conference proceedings (10/ publication).	Scientist (Sr. Scale) – 2 or 3 research papers published in journals are scored according to the NAAS rating of journal on the scale of 0.5 to 4.0 and totaled and multiplied by 2. The total marks do not exceed 18. For promotion from Scientist (Sr. Scale) to Sr. Scientist – 6 best research papers published in journals are scored according to the NAAS rating of journal on the scale of 0.5 to 4.0 and totaled (first author get full marks while others get 0.75 marks). The total marks do not exceed 18. Other publications have 1 mark each. The total marks do not exceed 2.
8	Text or reference books published by International publishers with an established peer review system have 50 points for sole author and 10/ chapter in an edited book; Subject books by National publishers or govt. publications with ISBN/ ISSN number have 25 points for sole author and 5/ chapter in edited books; Local publications with ISBN/ ISSN number have 15 points for sole author and 3 / chapter in edited books; Chapters in edited volume of international publications have 10 points per chapter while national publications have 5 points per chapter.	Books authored have 2 marks for first author, 1.5 marks each for co-authors. Books, conference proceedings edited have 2 marks for first editor, 1.5 marks each for co-editors. Book chapters, bulletins, technical articles have 0.5 marks for first author, 0.25 marks each for co-authors. The total marks do not exceed 7.
9	Group A – Sponsored major projects ongoing amount mobilized with grants above 30.0 lakhs have 20/ each projects while major projects amount mobilized with grants above 5 lakhs upto 30.0 lakhs have 15/ each project; Consultancy projects ongoing amount	For promotion from Scientist to Scientist (Sr. Scale) – Research projects have 10 marks each but the total max. marks are 20. Institutional activities have 1 mark for each assignment per year but the total max. marks are 10. Technology, prototype,

	minimum 5.00 lakhs have 10 points per every Rs. 5 lakhs. Completed projects have 20 points each for major projects and 10 points each for minor projects. Project outcomes have 30/ each outcome for national patents and 50/ each for International patents. Group B – Sponsored major projects ongoing amount mobilized with grants above 5.00 lakhs have 20/ each projects while major projects amount mobilized with grants above 4.00 lakhs upto 5.00 lakhs have 15/ each project; Consultancy projects ongoing amount minimum 1.00 lakhs have 10 points per every Rs. 1 lakh. Completed projects have 20 points each for major projects and 10 points each for minor projects. Project outcomes have 30/ each outcome for national patents and 50/ each for International patents.	genetic stock, variety, product, vaccines, diagnostic kit, process, concept, methodology etc have 2.5 marks each but the total max. marks are 5. For promotion from Scientist (Sr. Scale) to Sr. Scientist – Research projects have 5 marks for PI and 4 marks for Co-PI but the total max. marks are 20. Institutional activities have 1 mark for each assignment per year but the total max. marks are 10. Technology, prototype, genetic stock, variety, product, vaccines, diagnostic kit, process, concept, methodology etc have 3 marks each for PI and 2 for Co-PI but the total max. marks are 10.
10	Research guidance to M. Phil. has 3/ candidate; research guidance to Ph. D. degree awarded has 10/ candidate while 7/ candidate for thesis submitted.	No scoring of research guidance.
11	Research methodology course (not less than 3 weeks)/ workshops of not less than 1 week duration has 20 points.	For promotion from Scientist (Sr. Scale) to Sr. Scientist – convener or co-convener of seminars, symposia, conference, summer or winter school/ training program/ refresher course of duration 7 – 20 days have 1 mark each and 21 or more days have 2 marks each.
12	Organization of conference, seminar, symposia, workshops etc have no valuation.	Convener or co-convener of seminars, symposia, conference, summer or winter school/ training program/ refresher course of duration 7 – 20 days have 1 mark each and 21 or more days have 2 marks each.
13	Participation and presentation of research papers (oral/ posters) in International/ foreign conferences have 10/ each; Indian/ national level have 7.5/ each; Regional/ state level have 5 points per each while local/ university/ college level have 3/ each.	Not recommended in guidelines.
14	Invitations for conferences/ seminars/ workshops/ symposia to deliver lectures and/ or chair session have 10/ each at International/ foreign level; have 7.5/ each at Indian/ national level; have 5/ each for Regional/ state level; [illegible] at local/ university/ college level endowment lectures.	Not recommended in guidelines.

15	Awards by accredited International bodies; National bodies like UGC, CSIR, DST, DBT, ICAR, ICSSR, ICCR, Sahitya academy and other govt. and professional bodies, Bhatnagar award, Gnana-peet award etc have 50/ each; State/ university level has 20/ each and regional/ local level has 10/ each. other honours and recognitions awarded by international bodies like UNESCO, national like padma award, state, university, regional, local NGOs, Rotary, Lions etc and professional subject based associations have also be evaluated. Fellowship titles awarded by various foreign universities and academies and post-doctoral/ honorary doctoral degrees are also evaluated.	International and national awards/ fellowship have 2 marks each. Institutional or professional society's award/ fellowship and journal editor have 1 mark each. Best paper and best posters have 0.5 marks each.
16	Extension, co-curricular activities includes contribution to corporate life in universities/ colleges; institutional activities like field studies, educational tours, industry-implant training and placement activity; community service, social orientation activities through NSS, NCC, NSO etc, socio-cultural and sports programmes; professional ethics and campus development activities, institutional infrastructure projects, environmental education programme, value based programmes on TV/ Radio channels. Profession related contributions include institutional governance responsibility; membership in profession related committees; participation in subject associations; participation in training courses in educational technology, curriculum development, professional development, examination reforms; membership of professional associations, board of studies, editorial committees etc.	Extension work – field day/ farmer fair, demonstration, exhibition have 2 marks each. Lectures given in training programs have 2 marks for each. Technology assessment and refinement have 2 marks each. Total marks do not exceed 15.
17	Universities have to develop weightage formula to evaluate teaching/ academic performance.	ICAR itself evaluate the teaching/ academic performance.

COMMENTS ON UGC PERFORMANCE APPRAISAL SYSTEM AND ICAR GUIDELINES FOR EVALUATION

From the study of UGC performance appraisal system and ICAR guidelines for evaluation, some deficiencies are found which require

amendments in them. Here some comments are given for both the evaluation system of UGC and ICAR. These are as follows:

Comments on UGC performance appraisal system:

From the above study some important facts are noted which requires more thinking. These comments are as follow:

1. Teaching, learning and related activities are grouped in to essential and desirable activities which jointly have 150 points.
2. The points given to the lectures taken as percentage of lectures allocated becomes meaningless as the number of lectures would be manipulated to 100% and full points obtained.
3. Seminars, tutorials, practicals, contact hours etc. can also be manipulated to 100% to get full score.
4. The development of specialized teaching-learning programmes for physical education and library should include into essential activity.
5. Conference proceedings are given negligible weightage. They should be given more weightage according to their status like international, national or regional level. Because today, the international and national conferences have published their proceedings and have more approach to faculties and researchers than many of the reputed journals. These conferences not only publish the research articles in their proceedings but also provide a platform or forum to the researcher for presentation of the article and discussion on it. Conference proceedings are peer reviewed now-a-days.
6. Research projects show the weightage given to the principal investigator as there is no indication of how the points will be distributed if there are more than one investigators engaged in a project.
7. Organization of conferences/ seminars/ symposia are given no weightage inspite of their importance in exploring the latest research works and outcomes.

COMMENTS ON ICAR GUIDELINES FOR EVALUATION:

1. The research projects have sufficient marks but their resulted outcomes like introduction of new product or variety, development of new methods, techniques, prototypes, process, concepts etc have very less marks.

2. If the resulted outcome is of great importance or it should be a mile stone for further research then there is no evaluation guideline suggested for this type of outstanding research.
3. The maximum score for any activity is very limited for evaluation. As there is a limit of evaluation of 2 or 3 research papers published in reputed journals. If any scientist has more than three research papers published in reputed journals then the weightage of these extra papers is negligible in evaluation. This condition does not encourage the researchers to do more and more research activities.
4. There are no marks for scientists for providing research guidance to trainee scientists and research fellows.
5. There is much weightage is given to confidential reports. It receives 30% of total marks but it compresses transparency in evaluation of faculties on the basis of performance.

CONCLUSION

Both the UGC performance appraisal scoring system and ICAR guidelines for evaluation provides a score based defined status for promotions. These systems include almost teaching, research and related activities as performance indicators and give them weightage according to their role in overall performance. These systems provide well defined scoring system and formula for evaluation of faculties for promotion under career advancement scheme.

The UGC guidelines of performance appraisal scoring system are recently applied for career advancement scheme for faculties and found displayed on Internet on UGC's own website. Some amendments as suggested below are required for implementing the proposed UGC performance appraisal scoring system guidelines for evaluation.

Similar comparative study can be made in future for CSIR, ICMR, IITs, AICTE, ICSSR and many other councils related to higher education and research and development activities.

SUGGESTIONS

For performance appraisal scoring system guidelines proposed by UGC, there are some suggestions given below –

1. These guidelines of performance appraisal scoring system for promotion are found to be good and have to be implemented.
2. These guidelines provide fair marking of performance appraisal of faculties.

3. Conference proceedings have given more weightage than research journals.
4. Faculties are encouraged to publish and present more and more papers.
5. Besides journals, conference proceedings and books, other media or channel of communications are also given weightage.
6. Outstanding or milestone research findings or outcomes are given extra weightage and preference in promotion.

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