61st ILA INTERNATIONAL CONFERENCE

CONFERENCE PROCEEDINGS

Sustaining the Excellence: Transforming Libraries through Technology, Innovation and Value added Services in Google Era

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&
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Sustaining the Excellence: Transforming Libraries through Technology, Innovation and Value added Services in Google Era

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FOREWORD

One of the key objectives of the professional associations is to patronize and sustain excellence, so the Indian Library Association with this objective is organising 61st ILA Conference on the theme "Sustaining the Excellence: Transforming Libraries through Technology Innovation and Value Added Services in Google Era" in collobartaion with Saurasthara University, Rajkot (Gujarat), India from March 12 – 15, 2016. This year the topic reflects the growing need for libraries to demonstrate value, excellence in providing library services, innovations and integration, user oriented services, particularly, in terms of emerging new mobile technologies. Gujarat enjoins being the birth place for librarianship in India with the yeoman contribution of W.A.Borden, under the patronage Sri Sayyaji Rao Gaekwad III; let us cherish once again those immortal memories at this solemn occasion.

Throughout the history of the world, libraries have been important institutions for the cultivation and preservation of humanity. Libraries are the repositories for humanity's knowledge; they are our past, our present, and our future. Over the centuries, they continued to transform themselves to reflect the ever-changing needs of users. Today, libraries are much more than storehouses for books, journals, and newspapers, and include other forms of electronic data.

Recently, OCLC sponsored research report has reordered "Ranganathan's Five Laws" to bring the user, user needs and user's information seeking behaviour to the fore. It also emphasises that present day user's intent to search information more through "Google" and "Wikipedia", so the contribution of Library and Information Science has perpetuated even to this 'Google' era and that would be for the future. Despite the traditional reference service replacing gradually with virtual reference service, the user behaviour has not changed, as the user wants to interact with librarian 'face-to-face' thus giving humane face to the library services. Libraries and the LIS professionals will sustain excellence through beneficial application of technologies standing on the edifice built with traditional tools, techniques and methods thus adding value to the library services. I am sure the conference will give an imptus to the development of LIS professionals around the world.

I am eagerly looking forward to the learned outcome and valueable recommondations of this conference. I wish the 61st ILA International Conference "Sustaining the Excellence: Transforming Libraries through Technology Innovation and Value Added Services in Google Era" a great success.

Place: Kurukshetra
Date: 5th March 2016

Ashu Shokeen
Professor Dept. Of LIS
Kurukshetra Kurukshetra University
&
President, Indian Library Association

PREFACE

It is heartening to know that ILA has completed one life cycle by organizing 60 annual conferences in its ensuing present life span. According to the Hindu calendar, there are 60 Samvastraras and that mark one life. That was achieved last year by organizing 60th ILA conference. Now it is on its way to be reborn with 61st International Conference which is another landmark for the Association, which was founded 80 years ago. Let its existence; flourish to serve the LIS professionals for many years to come. This year 61st ILA International Conference is being organised on a contemporary theme **"Sustaining the Excellence: Transforming Libraries through Technology Innovation and Value Added Services in Google Era".** The selection of the theme is quite enriching to the professional knowledge and applications. Today, the role of libraries and the LIS professionals is changing worldwide. They are no longer passive keepers and preservers of books; rather, they have evolved to become facilitators of information and lifelong learning opportunities with an emphasis on service, identifying user needs and communicating solutions.

Modern libraries are unfolding the community's learning potential by providing information on community issues, such as health, employment, continuing education and local history and culture. They are also considered as important institutions for the cultivation and preservation of humanity. Over the centuries, libraries continued to transform themselves to reflect the ever-changing needs of users. Today, libraries are much more than storehouses for books, journals, and newspapers including other forms of electronic information and provide the physical and virtual spaces that are an integral part of an overarching system that provides opportunities for learning for people from all walks of life.

Libraries continue to undergo tremendous transition as they move to virtual services in response to changes in technology and the expectations of their patrons, they facilitate not only the use of existing information, but also generation of new information through applications of ICT.One significant change is the increasing convergence of traditionally different types of libraries in the services they offer. Such convergence has added values to the services it provides, which includes online access to digital resources, the re-tasking of library space, skilled staff in virtual librarianship and collaborative learning, as well as more customary types of service.

Today's libraries are busier and more vibrant than ever because of, not in spite of, the dramatic impact of digital and Internet in Google era. Users increasingly expect seamless discovery, the ability to connect to full text online without barriers and the right to reuse content in their own workspaces. Because of the complexity and diversity of today's knowledge creation and digital information environments, it is important that LIS professionals be equipped with both print and digital literacy skills - how to find, evaluate, and effectively use information from a variety of sources and formats to meet the users needs. Keeping in view the transforming library landscape, ILA brings together different disciplines on the library and information science, this conference covers the important LIS topics in conjunction with the other disciplines including ICT as its platform, innovation and economics, management and marketing, human resources, archives etc. The ILA invited papers on below enlisted sub-themes and received an overwhelming response

from the LIS professionals. Fifty-nine papers have been accepted for publication in the proceeding. The accepted papers are of the following sub-themes for presentation during the Conference.

- **Technological Innovations and Its Impact on Library and Information Centres**
- **Digital Library and Institutional Repository**
- **Metric Analysis**
- **E-Resources and Information Use Studies**
- **Human Resource Management and Leadership**
- **Information Seeking Behaviour (ISB)**

The papers included in this volume and the authors of the papers have addressed issues involving above themes. This International Conference provides a suitable platform for proposing these issues for discussion by the learned delegates.

The Editorial Committee thanks all the authors and contributors for making the conference an interactive platform to share their rich experience and contents to enhance the skills of the LIS professionals. We wish all the participants best of luck and hope the event would be a learning experience in their future endeavors.
Thank you one and all

Place: New Delhi
Date: 5th March 2016.

Editors

CONTENTS

Theme I: Technological Innovations and Its Impact on Library and Information Centres

Sl no.	Content	Page No.
1.	Technology Adoption and Adaptation in University Libraries in India: Librarian's Perception *Amit Mittal*	2
2.	Transformation of Library Services in Digital Environment *Vinod Kumar and Abha Sharma*	10
3.	Quick Response (QR) Code and its Impact to access E-Resources in the Central Library of ADTU *Prafulla Kumar Mahanta*	17
4.	Mobile Technology in Academic Libraries *Anjana P Barot and Kirit H Shukla*	28
5.	WhatsApp? – A Platform to Promote Library Products and Services: A Successful Experiment at SCSVMV University *Devika, S S*	34
6.	Use of 'Whatsapp' Messenger in Library Services *Parveen Kumar*	40
7.	Cloud Computing and Libraries: A Step Ahead *Arvind Mittal*	45
8.	Application of Cloud Computing Technology in Libraries: An Overview *Ravi, A*	49
9.	Library and Information Services in Google Era *Gautam, Vinod and Gawadekar, A.S., Tailor, Nand Kishore*	53
10.	Internet of Things (IOT) and Security: The Future of Libraries *Chintan K Pandya and Shilpa J Boricha*	60
11.	The Role of School Libraries in the Digital Age *Shilpa J. Boricha*	64
12.	Design of Effective Library + Commons Model for an Engineering College: A Case Study of ATMIYA Group of Institutions *Sheetal D. Tank*	69
13.	Embracing Open Source Software for Library Automation: A Feasibility Study Based on Selected Libraries in South India *Gireesh Kumar, T K*	74
14.	Use of Mobile Technology by Social Sciences PG Students of Kurukshetra University, Kurukshetra, Haryana: A survey *Deepak Kumar*	82
15.	Library Service Quality Assessment of NLS, Bangalore: A LIBQUAL Study *Rakesh Mohindra and Ashu Shokeen*	91
16.	Planning and Management of Library Space for Changing Users' Needs *Dharam Kumar and Pardeep Rai*	103

	Theme II: Digital Library and Institutional Repository	
17.	Digital Library: An Overview *Mallapureddy Giribabu*	111
18.	Digital Libraries of Different Ministries in India: A Review Report *Rajni Sharma, Babita Saini, Priyanka Mishra, Vikram Raghuvanshi, and Priyadarshni Mishra*	115
19.	Creating a Digital Library: Issues and Challenges *Sanjay Kumar, Reena Rani and Yash Pal*	122
20.	Data Mining: Implications and Techniques *Katkar, M K*	127
21.	Krishikosh an Institutional Repository of Agriculture: A study *Vaishali B.Wadnerkar*	130
22.	Use of Institutional Repository for Information Dissemination and Knowledge Management *Madhava Rao, A, Vora, K C and Thipse, Y S*	137
23.	Open Access Repositories Worldwide in the field of Business and Economics: an Informative Study *Deepti Khatri*	150
24.	Digital Preservation *Dhanlaxmi Patel, Jalpa Tank and Dhanvanti Abhichandani*	159
25.	Big Data and Semantic Web Technologies for Digital Information Processing: An Overview *Shivarama, J and Adithya Kumari, H*	167
26.	A Concept of Creation of Metadata Schemas *Indira Dodiya and Jagdishchandra P. Gondalia*	174
27.	*The Concept of Crisis Management in Electronic Environment in Libraries* *Mange Ram*	185
	Theme III: Metric Analysis	
28.	Web Analytics and Performance Evaluation of Indian Library Association: A Critical Study *Rajesh Kumar Bhardwaj*	193
29.	Information Flow in Political Science Research: A Bibliometric Study of Doctoral Dissertations of Burdwan University, 2009-2014 *Amit Kumar Bandyopadhyay and Sanjukta Mondal*	211
30.	Study of M.Sc. Theses in Department of Agriculture Economics and Agronomy at JNKVV Jabalpur (M.P.) *Ramnivas Sharma, Bharvey, H C and Pradeep Kumar Dixit*	221
31.	Research on Annals of Library and Information Studies, 2011-2014: A Bibliometric Study *Nilam Chandrakant Chavda and Vaidehi Chandrakant Pandya*	228

32.	A Research Study on Bibliometric Analysis of the Indian Journal of Marketing — 2011-2015 *Jagdishchandra P. Gondalia and Hetal R. Maheta*	238
33.	Scientometric Analysis of OLP Projects at CSIR—National Metallurgical Laboratory during 1995-2010, Jamshedpur, India: A Case Study *Mishra, P N, Goswami, N G and Panda, K C*	245
34.	Footprint and Imprint: An Ecologic Time-trend Analysis of Cardiovascular Research -1983 to 2014 *Keshava., Thimmaiah, B.N and Hemavathi, B.N*	255
35.	An analysis of Library Collection: a Case study of Dr. H.R.Gajwani College of Education *Dharmishtha Dangar*	260
	Theme IV: E-Resources and Information Use Studies	
36.	Use of Electronic Resources by the Faculty Members of Engineering College Libraries in RTM Nagpur University Area: A Study *U. P. Nalhe and Milind. B. Ghangare*	266
37.	Awareness and Management of E-resources among P G Student and Research Scholars of the University of Rajasthan: A Case study *Rajkumar Bhakar and Bhoop Singh Verma*	276
38.	Use of e-journals provided under UGC-INFONET Consortium to Guru Jambheshwar University of Science & Technology, Hisar: An analysis *Vinod Kumar*	283
39.	Implementation and Utilization of N-LIST Programme in Shree M. & N. Virani Science College, Rajkot: A Study *Mahesh R. Solanki*	291
40.	Use of Information Resources by the JRF Scholars in Calicut University *Linsha, M*	301
41.	Usage Analysis of Online Public Access Catalogue (OPAC) by the Research Scholars of CCS Haryana Agricultural University, Hisar and the Means to Promote their Utilization: A Case Study *Bhanu Partap*	313
42.	Internet as a Tool for Learning and Knowledge Building: A study of Students Attitude towards the Use and Awareness of the Internet for Learning *Veena G, Pushpalatha K and Mallaiah, T Y*	326
43.	Users focused Library services *Milind B.Anasane*	334
44.	Paradigm Shift of Library in Higher Education: An Overview *Dinesh Kumar Kaushik,*	339
45.	Issues and Challenges of Engineering College Library Services in Aannd District of Gujarat: A Study *Vaishali Bhavsar and Umesh Patel*	346

46.	Library Portal of Sant Gadge Baba Amravati University Library: A Gateway of Information for Information Seekers *Mohan R.Kherde and Vishal Bapte*	354
47.	Copyright Issues on Electronic Resources *Taddi Murali*	361
48.	Copyright Violation of Cultural Resources: Current Scenario *O. N Chaubey*	365
	Theme V: Human Resource Management and Leadership	
49.	Human Resource Management for Libraries and Information Centres *Dipanwita Ray*	378
50.	Human Resource Management in Academic Libraries: An Overview *Sudhir Astunkar, Chandrashekhar Hanwante and Anil Bhoyar*	388
51.	Staff Development in University Libraries: A Crucial Element for the Success of CIS Programme *Hansaben Shashikantbhai Bhoj*	393
52.	Sustaining Excellence in Librarianship through Continuing Professional Development: with special reference to Universities of Madhya Pradesh *Sonal Singh and Surendra Singh*	398
53.	Emerging Challenges and Opportunities for LIS Associations - Improve the Image of the LIS Profession in Changing Environment *Sivasankar Prasad, O*	404
	Theme VI: Information Seeking Behaviour (ISB)	
54.	Investigation and Analysis of Information Seeking Behaviour and Satisfaction of Library Users in Digital Era: A Case Study of RaiSahabBhanwar Singh College, Nasarullahganj, Sehore (MP) *SukritiSaraf and BhanuPartap*	415
55.	Impact of Information Communication Technology on Information Seeking Behaviour among Users of Engineering College Library: A study *Veena, G and Krishnamurthy, M*	426
56.	Information Seeking Behaviour of Woman Law Professionals: A Study *Minakshi Sontakke, Satyaprakash Nikose and Vaishali Wadnerkar*	439
57.	Individual Behavior in the Emerging Information Environment *Pankaj Kumar Singh*	449
58.	Users' perspective over the use of Public Domain Legal Resources: a Study of users of select Law Libraries in Delhi *Akash Singh and Nandini Sharma*	452
59.	Internet Use among University Students: A Case Study of Bangalore University of Karnataka, India *Hemavathi B N and Ramesha B*	460

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Application of Cloud Computing Technology in Libraries: *An Overview*

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Abstract: Cloud Computing is the latest technology which is now being adopted in various organization and when establishing new business. So this technology is also applicable to libraries in many ways. Due to implementation of this technology in libraries the process in library management systems is simplified it saves time and money, it basically benefit library in 3 ways, such as Adoption of New technologies, Acquiring Storing and retrieval of Data and it also helps the Library user community in many ways.

Keywords: Cloud computing, cloud technology and libraries

1. Introduction

Now a day's Cloud Computing has become a major topic of discussion and many libraries are trying to adopt this technology because it saves time, space and cost also. Due to adoption of this technology we may lose data in our server but it can be retrieved from the cloud technology which means that third or interface we can get back the required data . The data which is stored in our local server is stored parallel at the other end i.e. client and host server. The term **Cloud** refers to a **Network** or **Internet.** In other words, we can say that Cloud is something, which is present at remote location. Cloud can provide services over public and private networks, i.e., WAN, LAN or VPN. Applications such as e-mail, web conferencing, customer relationship management CRM execute on cloud.

With the availability of Cloud Computing technology now a days the hardware functionality which was installed and runs in local environment is now transformed or performed through internet or web on the network i.e. Internet Cloud. This becomes a platform for development and the operating system for the programmers are reusable and this being constantly updated with the latest software components and that can be embedded or loosely coupled with other web application. Some libraries are using some cloud computing services; online databases are being accessed through Cloud application. Big union Catalogs are also stated as Cloud Computing applications.

2. Types of Clouds

- **Public Cloud** allows systems and services to be easily accessible to general public. The IT giants such as **Google, Amazon** and **Microsoft** offer cloud services via Internet.
- **Private Cloud** allows systems and services to be accessible within an organization. The Private
- Cloud is operated only within a single organization. However, it may be managed internally by the organization itself or by third-party

- **Hybrid Cloud** is a mixture of **public** and **private** cloud. Non-critical activities are performed using public cloud while the critical activities are performed using private cloud.
- **Community Cloud** allows system and services to be accessible by group of organizations. It shares the infrastructure between several organizations from a specific community. It may be managed internally by organizations or by the third-party.

3. Areas for Improvement

Libraries are built with computer application of pre-web technology. So they cannot integrate at low price. They are cost effective. The database is distributed across the net. The data stored in libraries is huge and they have to maintain them, so the data being scattered across the presence of web is weakened. Libraries are being independent and there is no collaboration between different libraries, so the collaboration of the data becomes expensive.

The data available in the library is huge and the users are not able to use it full extent. So the Cloud Computing Technology helps in overcoming these issues and reduces the cost of maintenance of the libraries particularly Digital Libraries because the Data is stored and can be retrieved easily with low cost cloud computing in libraries Cloud Computing has to service with Hardware , Internet and Software in Data Centres which provides the services . They have been referred as Software as a service (SaaS) and Data Centre Hardware and Software is called as Cloud and when you agree to pay as you go in a manner and mode available to public it is called as Public Cloud and when it is not available Public we call it as a Private Cloud.

Cloud computing is the source of SaaS and does not include Private Clouds. There are 3 Aspects in Cloud Computing:

- Resources available in demand such as illusion of infinite Computing resources.
- Commitment by Cloud users for elimination of an up-strout and make them to start small
- Pay for use ability increases on Short Permission basis.

Do the libraries need Cloud Computing technologies to be adopted the answer is yes because with the Cloud Computing Technologies in the libraries the concept of cloud Computing is the power of cooperation and to build a significant presences in the web. This approach helps the libraries to save time money and the work which become easy.

4. Application of Cloud Computing Technologies In Libraries

- With cloud computing technology libraries can create their own web sites which helps the users in many ways

- They can build digital libraries, content management system, Institutional repository, can provide inter library loan, Integrated library management system from internal management server to vendor-hosted server
- Google doc's are being used by libraries to store library documents in creating a Google account and provide it to the users through cloud computing technology
- It is used as a back end for media collection, storing, accessing of bibliographic data which the libraries store and maintain huge amount of data
- More services can be offered by the libraries through cloud computing technologies

5. Potentiality for Libraries

Cloud computing technologies helps libraries in many ways which has a very good potentiality. The libraries can put more content through which the user can access more information in short span and need not go to shelves of books, DVD/CDS or for any material in any digital format or print format. Rare documents are scanned and kept in the digital libraries and these can also be retrieved easily. The main function of the library is data storage, information retrial etc., the files need back up, have to be maintained in proper manner so the they can be retrieved easily. The library must have good internet connectivity with good bandwidth for downloading the necessary information. Cloud computing helps in increasing the capacity and less need in for necessary updates and maintenance which has gained wider acceptance by the libraries

6. Evaluation

Cloud Computing is being accessed by using 3 central areas:

- Quality and Stability of Services
- Impact of ability to provide library services
- Comparison of cost with local technical solution.

7. Conclusion

The services in the library are being day to day with the advent of technology and Cloud Computing is one of it Cloud Computing can bring several benefits for libraries and make the libraries a different one from others with bright future. The cooperative effect of the libraries which use the same shared hardware ,service and data are how clubbed and made use through the web which saves time and reduce the cost of the library expenses in managing the library collection enhancing the library users experience and software flow . There is drawback in cloud computing technology. Sometimes the data is misused by third party for whom we have given the right to maintain the data in their serve. They sell or delete the data to other libraries and care should be taken while making the agreement.

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Cloud Computing and Libraries: *A Step Ahead*

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Abstract: As we know libraries are changing its services from the last many decades due to the impact of ICT. These services are user oriented services. There are drastic changes in the working of libraries as compare to the traditional libraries. There are too many shifts in the libraries like from service oriented to user oriented, fixed time to any time service etc. The role of librarians is also changed with the new inventions in the ICT. Cloud Computing is amongst one new technology for the libraries. Till now many libraries have already accepted it and getting benefits of it. With the help of Cloud computing libraries can provide the user friendly services to its users. Could Computing provide multiuser access. It uses software applications, storage data, accessing computing power or using a platform to build applications. In this paper author discussed the application of cloud computing in libraries and also the working of it.

Keywords: Cloud Computing, new technology in libraries

1. Introduction

Now a day Cloud Computing is the most adopted service delivery method in the field of library services. It is a common term for anything that involves delivering reliable hosted services over the Internet. It is growing very rapidly and providing alternative to the conventional computing. It is internet based distributing computing resources available on pay-as-you-go model. It is set to transform the way libraries work, unleashing librarians from the admin burden to focus on services for students and researchers (JISC, 2011). It is a new technology in the field of computing as well as in library science. With the passes of time, this technology is making its place. Libraries have stepped and are increasingly stepping into the realm of digital librarianship as well as platforms that extend its existing capabilities, and this extensively depends on using the cloud (Mavodza, 2013). Libraries are in a unique position to experiment with cloud computing given their service oriented mission and need to find appropriate solutions with limited resources (Mitchell, 2010).

We use this technology in our daily routine by using Whats app, WeChat, Google Docs, Facebook, Flickers, and Hotmail etc. Users who have had the experience of using Web 2.0 services like Wikipedia, Blogger, & Flickr etc. have already experienced 'Cloud computing', maybe unknowingly (Abidi et. al. 2012). With cloud computing information is not stranded on individual machines, it is combined into one digital cloud available at the touch of a finger from many devices (Hamm2009)[5]. The cloud is that concept in which we can store our data at one place and can be accessed from any other place. Cloud computing has one another feature, that it works in groups by coping data to each other. Cloud consists of thousand of computer terminals and servers that are linked with each other and can be accessed via Internet. Internet and American life study 69% of online Americans have already participated in cloud computing activities. (Kroski, 2009). It provides immediate availability, scalability, around-the-clock availability and resiliency (Cervone, 2011).

2. Cloud Computing

Cloud computing is a new technology for the library services. It is using web services for our computing needs, it includes using software application, storing data, accessing computing power or using a platform to build applications. When data and software applications reside used from the network rather than locally on any one workstation (Schnell, 2009). The basic principle of cloud computing is to distribute the tasks to a large number of computers instead of local computer. Cloud computing as a paradigm, which shifts the location of computing infrastructure to the network in order to reduce the costs associated with the management of hardware and software resources. It means that it stores large amount of data in a server at one place and distribute it at the public cloud at different places. It can hold the data in any form like Graphic, pictures, videos, voice, text, numbers etc.

3. Role of Cloud Computing In Libraries

Cloud computing describes the software other resources that exist online and are available to multiple users via the Internet, rather installed on a particular user's local computer (Behrend et al., 2011). Libraries are very eager to adapt to the new technologies that come into market. That is why many libraries already adopted to the cloud computing. Some of the libraries who have adopted the cloud computing are Dept. of Library & information Studies at University of North Carolina at Greensboro, The Ohio LINK Library Consortium is using the Amazon's Web services to host a handful of their Digital Resources Commons repository, The District of Columbia Public Library is using Amazon's EC2 service to host their website, The Eastern Kentucky University Library is using Google Docs

to Collect responses to web forms. There are many more libraries throughout the world that are using the cloud computing services to fulfill the demands of their users.

4. Benefits of cloud computing in the libraries services

Cloud computing faceted the libraries in using online software for online services like video chat etc. with the help Skype etc. Libraries can also take the facility to create online applications like "build test" that provides the freedom to develop own applications without purchasing the infrastructure. Libraries can get server space on rent through the various vendors. They don't need to worry about server crash etc. service providers provides the resource as well as storage space for data storage. In the way libraries have many benefits of using cloud computing service without investing any money on its infrastructure and space.

5. Conclusion

Cloud computing is no doubt a very useful for the libraries because it can be used by the libraries without any extra money spend on their infrastructure. It is also very useful for the library users because they can use libraries without leaving his/her place and they can even upload multimedia applications on the library website. It is already in use by many websites like Google, Yahoo, Amazon and many libraries are using it very effectively. The main advantage of using it is that libraries can pay-per-use basis.

The cloud service providers bear all the responsibility to handle infrastructure and storage cost. They provide proper backup facility to the libraries also. Even libraries can share their resources very easily with proper security. So we can say libraries are moving on right track by using cloud computing services. It is next step of libraries to the modernization of services without any extra cost spent on its infrastructure. On the other side library users is also getting twenty four hour service by using cloud computing at their door steps.

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Design of Effective Library + Commons Model for an Engineering College: *A Case Study of ATMIYA Group of Institutions*

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Abstract: The Library and information science professionals have long articulated about the significance of physical space settings and also collaborative, cooperative social environments that encourages learning through inquiry, collaboration, discussion and consultation comprehensively called in this case as Library+ Commons. Yet few Libraries in India have implemented the same. The purpose of the study is to determine the impact of providing Library + commons on the Library Usage, This study is a case study of Library + Commons at Atmiya Group of Institutions (offering UG & PG Programmes in Engineering, Management, Computer Applications and also Polytechnic programmes); it has been created in 2012 and is being upgrading periodically with inputs from its stake holders. In this study the impact of Library + Commons model on the Library usage in terms of each of the services offered under the model will be checked in order to understand the usage, user needs & user satisfaction.

Keywords: use study, library case study, effective library, common model

1. Introduction

The usage of Library is a matter of concern to the Library and Information professionals as it is a spending. The amount being spent on the resources is huge and with accreditation teams and affiliating Universities, councils of technical education evaluating and mandating the minimum Learning resource infrastructure it is inevitable for the Library professionals to take responsibility and act proactively in advocating the use of the Library and its resources. Thus renovating Learning spaces and providing more contextual services are a need of the hour. But once we have created them it is also necessary to see if it actually contributes to teaching, learning & research processes. This also calls for a strong Faculty-Librarian collaboration in the institute, so that the Library services like the Information Literacy programmes as a part of commons are integrated into the curriculum. Librarians have always promoted the idea of conceiving an interdisciplinary, multidisciplinary research by its community; that is possible when a common space and activities are administered for the purpose. Thus the part of commons which promotes research skills development can play a role in this endeavor.

2. Statement of the problem

There are many case studies available of the practice in one form or the other but maximum of these case studies are international. There is no such case study that I have come across in the Indian Context. Secondly, major case studies are from Universities and colleges that are autonomous. So fat I have not encountered any case that is of a self finance nature and also affiliated to an State Technical University. Thus the study of user needs assessment for the Library + Commons and studying the impact of the model of practice on

library usage at a self financed Engineering Institute- Atmiya Institute of Technology and Science will be the problem

3. Research questions

- Whether change in design of physical spaces in the existing library setup will increase the Library usage?
- What are the services that are most preferred by the patrons in the Library?
- Whether providing information literacy programmes increases the use of library resources?
- What are the other major factors that can influence the library usage?
- What are the parameters to be considered for understanding the needs of the patrons during designing services for curriculum integration?
- What type of Library staff training is needed in order to facilitate maximizing of the Library usage?
- What models of faculty – librarian collaboration help in maximizing the library usage?

4. Objectives

- To study the type of changes in the physical space design of the existing Library and its impact on the Library usage
- To study the type of services that are most preferred by the patrons in the Library
- To study whether providing information literacy programmes increases the use of library resources
- To understand other major factors that can influence the library usage
- To explore the parameters to be considered for understanding the needs of the patrons during designing services for curriculum integration
- To understand the type of Library staff training is needed to facilitate maximizing of the Library usage
- To understand the models of faculty – librarian collaboration help in maximizing the library usage

5. Hypotheses

- Change in the design of physical spaces has a positive impact on library usage
- All the services are not relevant to the Library Users
- Providing information literacy programmes increases the use of library resources

- Library staff training is essential in order to facilitate maximizing of the Library usage

6. Scope and Limitations of the study

Until the influence of the variables under study are not tested it will be difficult to say about the limitations of the study as it will decide if the implementation of the model is purely subjective or can be generalized and if it can be generalized then what are the steps one has to take prior and after the model is in place for its sustainability will be another issue all together. It is a continuous process because of the very nature of information seeking behavior and community practices which the literature already shows that it cannot be predicted.

7. Research Setting and Universe of the study

The Library at Atmiya is built on three floors, the basement houses the PG collection (MBA, MCA, ME EC, ME CE), Reference, Print Periodicals, a media library (+av aids room), Digital Library room, staff reading room, a reprography corner. The ground floor has the text and curricular section, the lending section, the e-library with 30 PC's, the OPAC corner, the Multimedia corner, the Lounge, technical processing room, Librarians Chamber, newspaper section etc. The first floor has been deigned to be the future Commons; it has been renovated with the cafeteria, a bookshop, general reading space, individual study carrels, a lecture room/ exhibition room & group study rooms. The Library also has access to latest technologies in terms of ICT tools as the Institute has a strong ICT/ Computer Centre at service. Library has a good collection of both Print & online resources. It has a collection of approx. 50000 books, 7000 multimedia, 250+ print periodicals, 9 online resources and 2 databases made available on the IP; subscriptions to Library Networks like DELNET & ADINET and membership of AIRC & BL. The patrons are UG students, PG students, Faculty, Extended members from other institutes and industries.

8. Population and Sampling frame

The population frame for the research is the entire student & faculty community of the institute. Student Community will have students pursuing UG, PG courses and the Faculty of different branches of Engineering being offered at the Institute.

- **Sampling method:** Sampling method will be simple random sampling as the entire population will be studied.
- **Sample size:** The entire population of Approx. 2000 students and 100 Faculty is what we assume but the pilot study will provide a more insight into the feasibility of the same.
- **Unit of analysis and unit of information:** The major units of analysis are the Different services offered under the model; the infrastructure & resources made available under the model; & the people involved in facilitating the same. The units

of information for each of these units of analysis will be worked out based on the pilot study that will be conducted.

- A decision as to whether an instrument needs to be created for this study or whether to use the existing instruments like SERVQual or LIBQual will be decided on literature survey on Validation of the Tools. If they are not found feasible then a separate instrument will be designed to collect the primary data. A questionnaire will be designed meticulously keeping in account all possible factors affecting the library usage will be taken into consideration. For some of the qualitative inputs will be gathered through focus group meetings. A pilot study will be conducted to test the tool to get some valuable insight into the existing system and its dynamics.

9. Methods of Data Collection Procedures

The data will be collected through questionnaires in different time frames to address the variable influence on the study. There will be attempts made to appoint people from outside and inside depending on the critical inputs needed so that the data is not influenced by any factor other than the one under study. Continuously data will be recorded at different point to avoid the missing of any valuable data. The pilot study will be conducted to test the tool and also to understand any missing parameters of the study. For the study, data would be collected from using a mixed method approach where qualitative methods such as survey and quantitative methods such as interviews and focus group discussions techniques will be used. A table illustrating the configured data sources and methods followed for research questions is prepared after studying the suitability of each method against research question.

Research Questions	Data Sources and Methods
1. Whether change in design of physical spaces in the existing library setup will increase the Library usage?	Semi-structured interviews with faculty and Students.
2. What are the services that are most preferred by the patrons in the Library?	Survey with Students and faculty using Questionnaire
3. Whether providing information literacy programmes increases the use of library resources?	Survey with Students and faculty using Questionnaire
4. What are the other major factors that can influence the library usage?	Semi-structured interviews with faculty and Students.
5. What are the parameters to be considered for understanding the needs of the patrons during designing services for curriculum integration?	Focus Group discussions would be conducted with faculty and students
6. What type of Library staff training is needed in order to facilitate maximizing of the Library usage?	Semi-structured interviews with faculty and Students.
7. What models of faculty – librarian collaboration help in maximizing the library usage?	Focus Group discussions would be conducted with faculty and students

The **survey method** would be used to understand most preferred library services and to study whether provision of information literacy programmes to users increases the library usage.

Similarly, **interviews** would be conducted with faculty and students to explore whether the change in library space design increases the library usage. The interviews would be conducted using semi-structured interview schedules.

Focus Group discussions are used to explore the parameters to be considered for understanding needs of patrons during designing of library services and their integration in curriculum. Also, another aspect investigated by focus group discussions involving faculty is the model of faculty –librarian collaboration that maximizes the usage of library services. A discussion guide would be used to provide a frame work for discussion and to collect data.

10. Conclusion

Commons culture is here to stay and seems to be the best way to help us collaborate and work with the entire ecosystem in which the library exists. Thus the proposal for research in this area seems timely and has many benefits to evolve as a central space for many aspects that the library can look into to contribute and complement the entire system of education. At Atmiya our experiments have helped us achieve a prime place and position in the decisions related to Academic, curriculum and co-curriculum and Research and development related activities. Many experiments have been done world over in the Libraries and thus the Libraries have been redefining their roles at the same time keeping their value intact – "Providing authentic learning resources to its patrons in all the forms".

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Embracing Open Source Software for Library Automation: *A Feasibility Study Based on Selected Libraries in South India*

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Abstract: Emergence of open source technologies have revolutionized the way in which libraries performed their activities and services. Proprietary software requires licence which demands cost and reduces the freedom in its use and customization. The present study intend to determine the perceptions of proprietary Integrated Libary System (ILS) users on adopting Open Source ILS (OSILS). Analysis of the research study identifies the major issues which forestall the wider adoption of OSILS and identifies few possible recommendations to enhance the rate of adoption of OSILS by proprietary software users in Indian libraries. The study adopted online survey method to gather primary data and the horizon of the survey was limited to libraries in South India exercising any of the library automation software under a commercial stream. Analysis of the study found that though majority of the proprietary software users in South India highly reccommend and support the adoption of OSILS, lack of technical knowledge required in installing and maintaining the software foreclose the process.

Keywords: Open Source Software, OSS, Library Automation, Integrated Library System, OSILS, India

1. Introduction

The landscape of library and information centres in terms of its automation activities has been highly commuted in the last two decades. Integrated library systems (ILS) are programs that manage automation activities of libraries in an effective and efficient manner there by reduces the manual processing involved in its operations. There are good numbers of ILS which are available in both open source and commercial stream. The automation software available in the open source platform and distributed with the source code under a licence is named as Open Source Integrated Library System (OSILS). OSILS is now playing as a stepping stone and financial choice for many institutions in India. Self sufficiency and independency are the two major factors which attract users to adopt OSILS compared to its proprietary counterparts. The main reasons for the adoption of and interest in open source software by librarians are eliminating their dependence on the proprietary-service vendors, gaining more control over the ILS by making it customizable to the local requirements of the libraries (Wrosch, 2007). Adoption of OSILS further offers significant benefits to libraries to provide innovative approaches and services to their clients compared to commercial packages. Though adoption of OSILS involves invisible costs in-terms of expertise, infrastructure, maintenance and updation comparatively it is a better choice for libraries to independently execute innovative services to its clients.

2. Literature Review

In India, the process of library automation has been developed and matured over the years. Many libraries have already automated their library activities with the available ILS to perform their activities. Significant number of libraries have already adopted or migrated to OSILS. The literature reflects that the tendency for embracing OSILS have been enhancing in all kinds of libraries in India in the recent years. A few studies have been published on adopting OSILS by proprietary software users. OSILS is an economical alternative to costly proprietary packages and does not require the initial cost involved in the commercial one such as software development, license and maintenance etc. are comparatively lower than commercial software. OSILS provides technological freedom to the libraries and also help the library professionals to provide services at lost cost or free of cost (Kamble, 2012). OSILS has undergone frequent revisions and updations and provide specialised services to libraries to incorporate with the emerging technologies. The next generation ILS is steered by the rapid advancements in the area of computer science and is adapting itself to the state-of-the-art forthcoming hardware architectures and software technologies (Tyagi & Senthil, 2015). However the rate of adoption of OSILS among Indian libraries needs to be enhanced further. According to a survey conducted by Jasimudeen and et.al, the primary reasons of libraries not implementing open source solutions for their automation purposes are lack of awareness, training and absence of encouraging government policies (Jasimudeen and et.al, 2014).

OSILSs are familiar to majority of the professional but still they continue to depend on proprietary software for library automation. Kumar and Abraham (2011) found that the adoption of open source library management system is restricted in India by the lack of awareness and knowledge in open source technology among library professionals. Another relevant study was conducted by Gireesh Kumar and Jayapradeep revealed that though LIS professionals are oriented, insufficient technical support and inadequate training and opportunities are the main barriers in adoption and introduction of OSILS in Indian libraries (Gireesh Kumar and Jayapradeep, 2015). In OSILS, library staffs are required to acquire minimum technical skills to handle the issues and up keep of the software. Professionals should be able to understand the features and facilities of different ILS and choose them according to their requirement. Reddy suggests that in spite of the challenges, libraries should consider the capabilities of OSILS and evaluate their merits of the features, reliability and support (Reddy, 2004).

Indian libraries which have not automated with any of the software should consider and look forward to adopt OSILS packages. The study of Kamila concludes that it is better to use OSILS because of its many useful features such as importing of data directly from Library of Congress and other large databases which minimizes the processing work of library, main library and branch library automation facilities, MARC21, Z39.50 etc. as well as its freedom to change the source code as and when necessary which can solve the local problems of every institution (Kamila, 2008). However selection of a suitable OSILS depends on other factors such as sustainability, availability of functionalities to meet

specific requirements, consortia supports, quality documentations, community participation etc.

3. Objectives

The basic objective of the present study is to assess the attitude of proprietary ILS users towards the adoption of OSILS in South Indian libraries. Following are the main objectives of the study.

- To measure the attitude of proprietary ILS users on OSILS adoption in South Indian libraries
- To identify the major concerns which hinder wider adoption of OSILS by the proprietary software users in South Indian libraries
- To figure out few possible recommendations to enhance the rate of adoption of OSILS by proprietary software users in South Indian libraries.

4. Methodology

Online survey questionnaire method using Google doc, an online tool of Google was adopted for collecting the primary data. The structured questionnaire focusing different aspects of OSILS was prepared and the respondents were chosen from the libraries of South India using any of the automation software for their library. The covering letter with online link to the questionnaire was sent to the users of proprietary software through their personal email. As many as 144 libraries across the southern part of the country were responded to the questionnaire. The responses were received from various kinds of libraries such as academic, special, research and corporate by the respondents of different age group and educational qualifications. The received responses were analysed on the basis of respondent's geographical location, gender and library type, legacy software being used and user's perception of usefulness of OSILS. The survey was carried out over a period of 11 months (from March - January 2015) to have a higher response rate.

5. Scope and Limitations

The flexibility, cost effectiveness and availability of source code etc are the major reasons which make libraries to adopt OSILS when compared to commercial packages. However the rates of adoption in Indian libraries are comparatively low and the study investigate the reasons for not being migrated to OSILS by the proprietary ILS users. The study limited its horizon on libraries using any of the proprietary ILS located in South India. The study is intended to consider every library in the region of South India using any proprietary software irrespective of the kind of libraries such as academic/research/school libraries and collection size. Consideration was also given to the state of Telangana separately as the state is part of South India after the bifurcation of Andhra Pradesh.

6. Analysis and Findings

It is found from the study that 97% of the respondents using proprietary software were aware of the existence of OSILS and among the total respondents 80% were supporting its adoption in Indian libraries and a higher majority of the respondents (70%) indicated Koha was the best suitable software they intend to adopt followed by NewGenLib (10%). Although the percentage of interest was comparatively low, 38% were indicated that they planned to adopt OSILS for their libraries in the near future. The study also identified the distribution of proprietary ILS among the respondents and found that LibSys is the most commonly adopted software in the commercial stream used in South Indian libraries followed by Easylib. The software such as Autolib, Libsosft and SOUL are equally (10%) distributed among the respondents. In the same way software like Liberty, ModernLib, Nirmals and SLIM are also circulated at the rate of 3%. There are software being used in less number which include Bees Campus Soft, BookMagic, Campuslib, Delplus, Grandha , Grandha, Lib Manager, LIBRIS, Libsuite, ROVAN, TCSion, VTLS etc having less than three responses and the software of in-house developed in nature. The response rate of the in terms of its proprietary ILS is diagrammatically represented in

6.1. Geographical Location, Gender and Library Type

Segmenting upon the geographical location, the state of Tamil Nadu became first with highest number of respondents as 39 (27%) male respondents and 09 (6%) female respondents followed by 39 (27%) male and 04 (3%) female respondents of state of Karnataka. The response rate of Kerala marked as 18 (13%) male and 06 (4%) female respondents where there were no female respondents from the states of Telangana and Andhra Pradesh, however they had a male respond rate of 17 (12%) and 12 (8%) respectively.

Respondents were asked to indicate their library type as academic, special or research, public and corporate and were given as default options to choose. A majority of the respondents that had responded for the survey were from academic library and the rate of response from each state Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Telangana were 8%, 21%, 13%, 26% and 6% respectively. Distribution of the number of responses received from each state and under different type was represented in tabular form (Table 1).

Table 1: State Wise Response Rate from Proprietary ILS Users

Sl No	State	Respondents		Library Type			
		Male	Female	Academic	Special/Research	Public	Corporate
01	Andhra Pradesh	12 (8%)	Nil (0%)	12 (8%)	Nil (0%)	Nil (0%)	Nil (0%)
02	Karnataka	39	04	30	11	Nil	02

		(27%)	(3%)	(21%)	(8%)	(0%)	(1%)
03	Kerala	18	06	18	06	Nil	Nil
		(13%)	(4%)	(13%)	(4%)	(0%)	(0%)
04	Tamil Nadu	39 (27%)	09	38	09	01	Nil
			(6%)	(26%)	(6%)	(1%)	(0%)
05	Telangana	17 (12%)	Nil	08	07	Nil	02
			(0%)	(6%)	(5%)	(0%)	(1%)
Total		**125 (87%)**	**19**	**106**	**33**	**01**	**04**
			(13%)	**(74%)**	**(23%)**	**(1%)**	**(2%)**

6.2. Age Group of the Respondents

Different segments of respondents were made with regard to age of the respondents such as 21-30 years, 31-40 years, 41-50 years and above 51 years. Among 144 respondents 44% professionals were in the age group of 31-40 years where as the ratio of 21-30 years and 41-50 years were 14% and 32% respectively (Table 2). The senior respondents beyond 51 years stood last at 10%. It is learned from the analysis that the respondents age group of 31-40 showed better interest in responding comparing with the other three and there by assumed that they are prone to technological advancement in the library.

Table 2: Respondents Age Group

Age Group	No of Responses	Percentage
21 - 30 Years	20	14%
31 - 40 Years	64	44%
41 - 50 Years	46	32%
More than 51 Years	14	10%

6.3. Software Selection Authority

Selection of OSILS was very limited in the beginning when only few such open source solutions were available with no guarantee in its future existence. Availability of proprietary library software sometimes influences selection authority as they think proprietary software are more reliable. Respondents were also asked to indicate the final autority in their organization in library software selection process to find out the impact of the selection commitee in choosing an OSILS. Responding to this question, 39%

respondents answered librarian is the key person in selecting the library software followed by head of the institution (34%) and library advisory committee (24%). In either of these responses the engagement of library professionals is significant, however, the pragmatic process of selection and implementation of an ILS requires the confluence of librarian, IT experts to make the application self sufficient and effective.Very few (3%) had mentioned Infrastructure Development Committee, IT or team of computer professionals, department of IT, software selection committee, purchase committee and the management itself

6.4. Issues preventing the wider adoption of OSILS

Scanning upon the available literature and consulting upon senior professionals on the issues which hinder the wider adoption of OSILS in libraries, there were thirteen options being identified as the major reasons. These options were selected and the respondents were asked to choose the options they assumed with a flexibility of rendering multiple answers. The result of the analysis shows that a higher majority at 15% identified the lack of technical knowledge required to install and maintain OSILS was the biggest concern as far as Indian scenario is concerned. However other major issues like lack of technical support and shortage of skilled staff to install and maintain OSILS were equally (12%) reduces the rate of adoption. The other major reasons marked by the respondents were lack of promotional activities (10%) and issues of data security (8%). The emergence of issues such as reduced vendor support, software security and organizational policies were also equally (7%) marked as concerns to be addressed to enhance the rate of adoption of OSILS. Though the lack of community support and lack of major functional features and modules in OSILS believed to be reasons which slightly (4% each) had an impact on adoption. The issues of lack of high quality documentation and availability of proprietary software also prevent the wider adoption of OSILS in Indian libraries and 5% of the respondents were marked this statement as true. Issue of reliability/longevity of the software was also mentioned as a concern by some respondents (6%) and few had opined that professionals lack awareness and understanding the benefits of OSILS

7. Recommendations to enhance the rate of adoption of OSILS

Open source software by definition does not cost money to use, if the library has the technical expertise required to use the software, they can use it for absolutely no cost to them (Singh, 2014). Library professionals are to be more aware of the advantages and qualities of OSILS and are to be dynamic in sharing their experiences and involving in its development. Extensive hand on training programs needs to be organized frequently in educating the future library professionals about the advantages of OSILS. Library professionals should have more opportunity to attend free awareness and training programs on OSILS o build up their confidence in successfully implementing the software. Application of OSILS should be part of the academic curriculum and government organizations should draft policies to make mandatory use of OSILS. Library fraternity should involve in conducting training programs and workshop and simplified

documentation and training are required to be provided for customization and data migration. High quality documentation on OSILS should be available on the public domain and the software installation and backup process should be made easy. Indian libraries should consider consortia model for wider adoption of OSILS. Indian Libraries should have customized versions of single OSILS for any type of library. Indian Libraries should have an OSILS to support various Indian scripts. Utilization of cloud computing and adoption of OSILS reduces the risk of budgetary shortfalls in libraries up to some extent. Outmost care should be taken by the professionals while choosing a particular OSILS as many of the projects available in OSILS streams found to be inactive within a short period of their initial release. An OSILS with a growing and active user community, with institutional support can be preferred.

8. Conclusion

OSILS are to be considered as a possible alternative to costly proprietary software. Library professionals in India approach OSILS to bring down their expenditure for managing and circulating their resources. Open source for library automation extend an easy option for introducing technological innovations in libraries to provide newer information services. Proprietary software users are also interested to embrace OSILS for their libraries and support the adoption. However, lack of technical knowledge and support along with skilled staff to install and maintain OSILS prevent the wider adoption of OSILS in Indian libraries. Extensive and effective training to LIS professional for the implementation, installation, customization and maintenance of the software is very crucial for its successful implementation and management. The very survival of any OSILS lies in its active community. Koha software found to be the ideal one as it has a strong support of professionals through online forums and community to know the development and updates. Adequate planning as well as support from technical staff also very much essential to complete the automation within a stipulated time.

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Internet of Things (IOT) and Security: *The Future of Libraries*

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Abstract: According to a recent survey and internet will be dominated by machines and sensors rather by people. By 2020, Hewlett-Packard (HP) estimates that there will be close to a trillion sensors sending data over the web and will be added to the world of Internet of Things (IoT). The devices collect information, manage, process and in extend, it communicates with each other which called machine-to-machine communication. The age is transforming from information explosion to Internet of Things (IoT). What does a world where billions of everyday objects connect to each other and share information mean for libraries? IoT presents major opportunities for libraries to connect their services to more people and more things in more places than ever before. The paper is to discuss the overview of IoT, future perspective of libraries, security issues and many more.

Keywords: Internet of Things (IoT), Modern Library, Future Library, Privacy and Security, Smart Library

1. Introduction

As technology becomes smaller and cheaper, it is possible to embed computing, wireless communication, and radio devices into objects and connect them so that they can collect and transmit data and be controlled by other objects and connect to the larger internet infrastructure. Libraries are the oblique treasures which if uncovered can become like rare jewel for the growth of the society. In the 21st century, internet has become a knowledge portal and e-books have become inseparable part of library. According to a December 2014 eMarketer article, 44% of business executives worldwide had never heard of the IoT and another 30% had heard but were unsure as to what it meant. The same scenario had been observed with the discussion during the ALA Annual meet that majority of the librarian are also not aware about the IoT. When people talk about "the next big thing" they're never thinking big enough. It's not a lack of imagination; it's a lack of observation.

2. Internet of Things (IoT)

According to Technopedia; The Internet of Things (IoT) is a computing concept that describes a future where everyday physical objects will be connected to the Internet and be able to identify themselves to other devices. Facebook, Whatsapp, BBM, Instagram, Twitter or any other social networking sites; the youth are accessing all of them more through their mobile phones and lesser on computers. The net savvy youth finds mobile phones more feasible, easy and faster than desktop PCs, notebooks or netbooks. But Internet of Things is just not limited to the social media applications. It's lot more than the imagination. Over 50 Billion devices, 1 billion smart TVs and 1.5 billion smart cars are estimated to connect the IoT by the year 2020 which will have a 1.9 trillion economic value.

3. Internet Users - Indian Purview

The number of Internet users in India has reached 402 million by December 2015, registering a growth of 49% over last year, according to a report 'Internet in India 2015', jointly published by the Internet and Mobile Association of India (IAMAI) and IMRB International, today. While Internet in India took more than a decade to move from 10 million to 100 million and 3 years from 100 to 200 million, it took only a year to move from 300 to 400 million users. India already has the third largest Internet population in the world today, after China with 620 million and the US with 275 million. In addition, India already has 100 million active Facebook users today, the second largest number after the US and Canada with 152 million. As one fast forwards, it is estimated that there will be over 500 million Internet users in India by 2018—making India the second largest population of Internet users in the world.

4. Current Modern Library Practices

Current scenario of libraries is characterized by the fact that the human resources working at the libraries are dealing with latest technology at a greater scale. The type of electronic media and things available at the libraries are transforming its characteristics significantly. But as per the development of devices growing in the world of IoT; the old structure of library services are not enough. In other words, libraries should support users in adopting of IoT. Here is the current library structure, striving for the modern library practices.

5. Librarians and IoT Awareness

OCLC conducted a brief survey in late 2014 to assess librarians' familiarity with Internet of Things and related technologies. Majority of the librarians were not familiar with IoT, Smart City, Smart Car, Medical Monitor etc..., few of them had heard about IoT but not very much aware about the development. Several librarians also indicated that libraries should wait until the technology is more widely adopted. For now, sit and watch the development.

6. Optimization of IoT Technologies for Library

What does a world where billions of everyday objects connect to each other and share information mean for Libraries? A world divided by the prospect of a world connected. When world is changing and shaping in the cloud of IoT; library has a role to play.

7. Future Libraries

Librarians have to play a big role in migrating conventional library system to the IoT. The future of the IoT in libraries seems to be forceful. IoT would help users in providing location based services. RFID and smart book locator can help user to easily locate the shelf. Smart climate control can help user to change room temperature. The Smart ladder

and Smart step stool can help user to climb high cupboards. Smart Referral services inform users about their choice of collection and new arrivals.

8. Libraries have to think over some of the promising task about IoT

- Making Smart Library
- Inventory Control
- Mobile Gateways
- Smart Reference
- Smart Assistance
- Smart Trolley, Book Shelves
- Semantic Web
- Smart OPAC and URI
- Interlinked Metadata
- Climate Control and Smart Rooms
- IoT Accessibility and Compatibilities

9. Issues Related to Privacy and Security

IoT network is turning out to be very useful till any cyber attack arise. Smart cars are able to read e-mails and text messages to drivers on the move; smart fridges carefully manage the energy they use; smart medical devices allow doctors to monitor patients from afar; and smart screens in the home display all kinds of useful information. But security experts are sounding the alarm. There is a big difference between the internet of things and its security issues. If devices are hit by a cyber-attack, it will create a big nuisance; if cars are attacked, it could kill, if the fridge is attacked, it will reverse the cooling process, if the medical devices attacked, it will shows incorrect data of the patient which lead to major outburst. One of the potential challenges for a growing Internet of Things is the variety of data collection and reporting methods that might be misused. Without standards for this data's collection and transmission, the benefits of the Internet of Things may not be as fully or easily realized. IoT devices are memory and processor constrained devices; which is the biggest problem area as far as security issues like confidentiality, integrity, availability and authenticity of data are concerned. According to CISCO; Security experts are facing hurdles to achieve above mentioned security properties in the constrained environment. According to the Forbes, the security and privacy concern of the Internet of Things is half-baked. Devices that collect data and store data (including personal account information) and that potentially control parts of our lives would be susceptible to hackers. As many of the products are being developed; security may not be among the primary concerns of producers.

10. Conclusion

Libraries need to take into consideration various issues related to IoT. The privacy and security of library data i.e. patron and metadata as there are possibilities of hacking and sharing data with third party. Cost of the investment of IoT in the libraries, time and staff training has to be considered. Libraries are the witness of the history, revolution and

changes from conventional system to the digital libraries. Librarians have always played a vital role by optimizing development.

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Library and Information Services in Google Era

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Gawadekar, A.S.,
Tailor, Nand Kishore

Abstract: We are living in the explosive era of Information and Communication Technologies. In this era a numbers of tools and applications are available where Library and Information Science Professionals can deploy it in the day to day activities of library operations. In this study authors provide overview about Google tools and application for the smooth functioning of library Operation, administration, management and smooth functioning of library services. Authors are techno savvy LIS professionals and encourage focusing various Google tools and its application and developing a collaborative working culture.

Keywords: Library Services, Google Tools, Free & Open Source Tools, Collaborative Working Culture, Web-based Services

1. Introduction

The Library and Information Centers play a key role in developing a platform to generate process and disseminate the knowledge to intellectual society for the development of human being. Library Professionals has pivotal role for smooth functioning of Library operations. In the course of time for technological revolution, library professionals eager to utilize modern technology's tools & application (viz. Google tools) in providing innovative services for its patrons. With the goal of creating a better understanding of how tools and methods can assist in smooth functioning of library operation and learning practices, the LIPs are involved in how Google tools, would change the landscape of higher education. Intellectuals have added to the increasing amount of information available for others to determine the potential technological uses in academia. Library and Information Science professionals have already implemented Google tools into offering library services, research, and daily use.

Library and Information Science Professionals use Google tools for professional and personal development; however, this study is confined to understanding uses of Google tools at the institutional level. Gawadekar, A.S. (2012) identified Website, Google Fusion Table, Online Form, Gmail, Google Search, G-Drive, G-Documents, G+ (G-Scholar), Google Group, YouTube, G-Calendar, Picasso and etc. as the prominent Google tools for academic Libraries to enhance the library services and providing the optimum satisfaction in minimum time and least cost and reduce the duplication of work and utilization of manpower, money and resources in developing the human being concern. This research article will be elaborating major tools identified by authors which are helpful for providing optimum information. The following segments define and explain the various Google tools which can be used in academic libraries at the institutional level.

- Website
- GFT
- Online Form
- G-mail
- G-Documents
- G-Drive:
- Google Search
- Google Group:
- Google Scholar:
- You tube:
- Picasso:
- G-calendar:
- Google Translation

2. Statement of Problem

In the intellectual society, user driven environment plays an important role for Library professionals. For providing better services and existence in the modern intellectual society, Library professionals have to provide library services as per the need of the users. Library professionals can better understand the practical and technical issues of library and users and how to elucidate emerging issues of Library and Information Centre. Smoothly function of library operation is a nascent job and developing a user oriented environment is an art for library professionals, it requires professional skills, experience and depth knowledge of concerning area. It needs versed knowledge, skills, devotion of work and awareness of client and working system and environment needs. In this study authors tried to inculcate the following attributes.

- To understand the Google tools and its application in Library Services
- To examine the characteristic features of the Google tools and applications
- To develop a curiosity for amplification of Google tools
- To empower Library Professionals

3. Objective

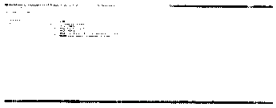
The most important objective of the study is to encourage Library and Information Science Professionals to implement such kinds of technologies and applications in library profession/services. The leading objectives are following.

- To encourage of LIPs for deployment of Google tools and its applications.
- To create/reorient Library technocrats to participate in responsive design.
- To elaborate the characteristic features of Google tools and applications.
- To promote Google tools for library services.

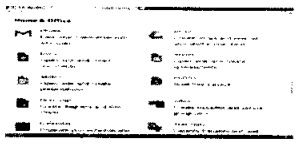
4. Google Tools & Application

Google offer various tools and applications for the users. Authors describe some important and useful Google tools which are helpful for the smooth functioning of library operations and provide the optimum information to knowledge seeker in emerging arena of Information. Following attributes are considered in the study.

1. Library website provides the bridge between library users and resources. Users can access their desired information from website in 24*7 from anywhere. By this Google tools library professionals can develop, maintain and modify a website as per their requirement. Authors developed websites for implementation user centric approach.

2. 

Data collection is an art and LIPS are playing with data, to create, maintain and analysis as per their requirement. Google Fusion Table is wonderful tool for data collection, preservation, manipulation and analysis in the era of user oriented service approach.

3. 

Library professional needs to gather the data for various purpose viz. Library Membership, Book reservation, Library Feedback Form and other library day to day activities. Google Form help to library professionals for development of user centric data collection and presentation..

4. 

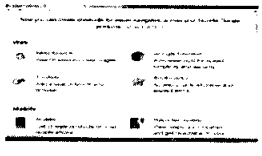
Library professional needs to communication to users, vendors, publishers and staff members regarding the various works. Google provide tremendous facility/services to communicate via the internet. It offers 15gb data storage which is free to all user of Gmail.

5. 

It is the need of the hour for developing the web based collaborative working culture and 24*7 /anywhere using of documents with no bar of wall. This tool help to create, edit and work in web based collaborative working culture.

6. 

Library has various resources, where library professionals serve to the intellectual society. Google Drive facilities to its users for storing 15GB data. We can access these data from anytime/anywhere and create web based collaborative working culture.

7. 

Data play a key role for the creation of information. Information retrieval is big challenges in the ICT explosion era. Intellectual society harness information resources in Google platform in various level of search. We can search information in various keywords and other logical search tools viz. Boolean Search Logic and other advance tools. Google Search engine now play a key role for the searching any information in any aspect and any type of information. We can get the information in fraction of time. This tool helps to LIPS to search and identify the information in various aspects.

8. 

Google Group provides exclusively facility to create group and share information among the group members. In the library we can develop various group for accessing the information and retrieve for optimization.

9. 

Google Scholar provides a gateway to research scholars for sharing, uploading, downloading and analysis of articles, papers and books. As LIPS we can utilize this tool to development in the institutional research and published papers analysis.

10. 

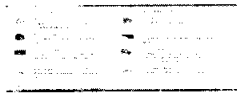
You tube is a tool of to watch, upload/download and share videos among the intellectual society and offer quality library services. By utilizing such kinds of tools LIPS can be a role model for the intellectual community and fulfill the social responsibility. We make video gallery for library and its resources and upload it to YouTube platform for optimum utilization of resources.

11. 

Picasa is a tool of to watch, upload/download and share photographs among the intellectual society and offer quality library services. By deploying such types of tools LIPS plays a key role for the intellectual community and fulfill the social responsibility. We make user oriented model and Photo gallery for library and its resources and upload as our albums.

12. 

By using this Google's Calendar tool, LIPS can develop, organize and inform to user's information and resources to web based collaborative working culture. It is pool for Library trinity.

13. 

Google offer Translation services to its users which is the best facility. We can translate more than 85 languages of all over the world. We can develop our vocabulary for enhancing the utilization of library resources.

5. Characteristics of Google Tools & Application

Every technology have their own pros and cons, as per the practical knowledge following characteristics are found by the authors in Google tools which mend to LIPS for deploying it's in Library profession.

- Free: Google tools are freely accessible into global arena.
- Access: Google tools are Anytime/Anywhere; Multiple input/output; Real time Access
- Collaborative E-working Culture: Sharing; Editing, Manipulating, Updating
- Easy: To understand/ learn; to implement; To Design
- Security: Data Security; Users Security
- Authentication: User Authentication; Data Authentication
- Infrastructure Development: No setup required (i.e. software, and etc.)

- Help and Support: Online Help, User Manual, Help Section and etc.
- Customization: It eases to customize for LIPS.
- Technology Environments: It offer technology environment.
- Saving: Time; Money and Manpower: By using these tools, we can save the time, money and manpower of library.
- Reducing: the Delivery cost, duplication of work, Communication Gap
- Support: in Decision Making, in User centric approach,

Each and every tool has some pros and cons, in spite this; LIPS can provide optimum satisfaction to its users.

6. Limitations Of The Study

Emerging technologies have renovated the information environment in the past decade, providing more rapid access to a greater volume of learning and teaching content at the earlier time. Google tools offer the variety of easy-to-use tools, based on free, use, learn, implement and text searching of the content. Following attributes are considered for the limitation of the study.

- **Library Professionals and Users:** Library is a trinity of resources, library staff and users. Library professional should eager to learn new tools and techniques and try to implement in the library services. Library users should have cooperate with LIPS for the deployment of these tools and encourage for successful deployment.
- **Management:** For the smooth conduction of library operation, there is important role of management body of institute. Management should inspire and help to library professionals for implementation these tools as a trial and error base. One more thing is they should provide all necessary help for successful deployment of these tools and acceptance of these technological models.
- **Technical:** A number of technical problems are facing during the trial and error based model. Library professionals should have to take initiatives and go to further help and learn and deploy in the library profession. Internet is a basic need of using these tools. In the present Internet can easy accessible to all from mobile, net setter and various devices which are available at the cheapest rate and everywhere.
- **Time:** Time factor play crucial role for the deployment of Google tools. Due to regular work of library, professional should learn, understand practical application of tools it is a time consuming process. But after all once you deploy these user centric tools, you will save time, manpower, reduce the duplicity of work and a number of facilities and services in finger touch.
- **Others:** Authors face various problem during the implication of Google tools in offering library services for optimum satisfaction in optimum time and form at the

24/7 availability at desired place. There is no ending of limitations of deployment of these Google tools, but someone said "Where is will there is way.

7. Conclusion

The new technology if exploited and implemented effectively can bring sea change in the Library & Information Resources Centre, thereby solving many library problem such as quality of services, product, wastage & stagnation, mass failure of users, delinquency and truancy. New technology has immense potential and can herald as a revolution for the world of learning, but it is possible only if those involved in it give themselves the means to do so. Above discussed tools play a key role in providing the maximum services & facilities to users. It helps to fulfill the five Laws of library & Information Science. In present scenario, Library & Information Professional should cultivate their field of knowledge in professional way. They should contribute to the field by research, innovative works & updates with the new technology; we take a small step to fulfill the demand of present era of explosion of information.

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Library Service Quality Assessment of NLS, Bangalore: *A LIBQUAL Study*

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Abstract: The present study measures Library service quality (LSQ) associated with user satisfaction of NLS, Bangalore. To measure the Library service quality, users' expectations and perceptions were initially identified. Users' perceptions of current services were also identified, from which perceived service performance was identified. A LibQual instrument was used to survey NLS users. User responses for minimum, desired, and perceived services were obtained. A gap analysis was done to measure the LSQ that reveals two types of service quality gaps, i.e. (i) adequacy gap, which provides adequacy level of Library services, and (ii) Superiority gap which indicates the service quality shortfall. Overall Users' satisfaction with library services was also identified. The present study further finds out the relationship between LibQual dimensions and overall user satisfaction with NLS library services. Regression analysis shows that only Information control dimension significantly predict user satisfaction, which account for 23.5% of variance.

Keywords: Service Quality, LIBQUAL, Assessment, NLSIU, Bangalore.

1. Introduction

National Law School of India University was established with recommendation of Law Commission of India and the Bar Council of India to establishing a specialized law universities solely devoted to legal education, with a aim to revitalize the legal profession by making law as an attractive profession and making it competitive to attract talent, which was hitherto diverted to other professional areas such as Medicine, Engineering, etc. The prime objective of the NLS is to offer a multi-disciplinary and integrated approach to legal education. Further The Bar Council of India, approved the Rules on Standards of Legal

Education and Recognition of Degrees 'BCI Education Rules, 2008, which have made mandatory conditions in respect of the University Library & ICT facilities for accreditation. Bar Council of India has laid down standards in terms of system, classroom teaching, practical training and skills, court visits, moot court, legal aid work, and other practical training programmes for law students. This has given a special impact to Indian legal education.

2. Sri Narayan Rao Memorial Memorial National Law Library: A Brief Profile

The Library Known as Sri Narayana Rao Memorial National Law Library is a three storied building of 30,000 sq.ft. built-up area with ample space for storage of books and for reading purposes. The library is being managed by a team of professionally qualified library professionally under the guidance of Library Council. The library has an open access system to facilitate readers to have easy access to the library resources. The NLSIU Library has been linked with other important libraries in and around Bangalore in order to provide inter-library access for the benefit of students and teachers of the Law School. To assist the students and Research Scholars in locating literature as well as information in their areas of research, general reference, current awareness and computerized catalogues have been introduced. An orientation programme is also organised for new students to help them acquaint themselves with the library system and services and for enabling maximum utilisation of the available resources.

3. Background of the Study

University libraries exist to support its academic community; hence their effective organization is paramount with the development of the Institution. Academic institutions have been dramatically transformed due to ICTs revolution and also revolutionary change in their libraries cannot be isolated from this change. They have to change accordingly. The old concept of book-oriented librarianship has long been taken over by user-centered librarianship. Academic libraries are established in "support of the mission of their parent institutions to generate knowledge, and people equipped with knowledge in order to serve the society and advance the well-being of mankind" (Raja, Ahmad, Sinha, 2009:701). The main function of all academic libraries is to support the mission, vision and objectives of their parent institutions.

4. Objectives of this study

- To identify the minimum level of expectations with Library service.
- To identify the desired level with Library service.
- To identify the Perceived level of Library service.
- To examine the adequacy with provisions of library service.
- To identity the superiority gap for assessing Library service quality.
- To examine the users satisfaction with library service.

- To explore the relationship between dimensions of library service quality and users satisfaction.

5. Hypotheses

- There is no significant relationship between LibQual dimensions at perceived level with overall users' satisfaction.
- Libqual dimensions at Perceived level have no significant impact on overall users' satisfaction.

6. Methodology

User's satisfaction is an important measure of service quality in libraries, which provides an important feedback for libraries to assess and improve its service to its users. Based on the objectives of the study, survey method was used for this study using LIbQUAL+ tool as data collection instrument to measure the expectations and perceptions among the customers/users of NLS. The questionnaire consists of three sections. The first section contains 22 items for three dimensions of Library service quality i.e. Affect of service (AS) - 9 items, Information control (IC) - 8 items and Library as place (LP) - 5 items. The second part consists of 3 questions on satisfaction with library service provisions. The third sections covered 2 items on library use pattern and demographic information like gender, status of respondents and duration of stay in the university. Standard Nine point Likert's scale was used with "1" being "strongly disagree" and "9" being "strongly agree". The library users were invited to respond via an e-mail invitation that directed them to a link of web-based questionnaire. In addition 125 printed questionnaires were also personally administered. A total of 104 complete and valid questionnaires, were analyzed with the help of IBM-SPSS software, version-22.0.

7. Data Analysis

The analysis of data is presented in the tables as per the objectives of the paper.

Table 1: Demographic Profile of the respondents

Demography	Status	Frequency	%
Gender	Males	46	44.2
	Females	58	55.8
Status	UG	75	72.1
	PG	15	14.4
	RS	8	7.7
	Faculty	6	5.8

Duration of Library use	1st	32	30.8
	2nd	30	28.8
	3rd	17	16.3
	4th	14	13.5
	Above 5 Yrs	11	10.6
Frequency of Library Visit	Daily	56	53.8
	Weekly	36	34.6
	Monthly	9	8.7
	Quarterly	1	1.0
	Rarely	2	1.9
Frequency of access to the Library website	Daily	36	34.6
	Weekly	54	51.9
	Monthly	9	8.7
	Quarterly	4	3.8
	Rarely	1	1.0
	Total	104	100%

Table 1 presents the socio-demographic details of 104 respondents. 55.8% of the respondents were females and 44.2% were males. Majority of respondents (72.2%) were undergraduates. 30.8% of respondents were using the library for past one year and only 120.6% were having more than 5 year experience of library use in the university. Two questions of library visit had been analyzed related to respondents' i.e. frequency of physical visits to the library and frequency of access to library through website. A total of 56 (53.8%) respondents physically visit the library daily and 36 (34.6%) weekly and more than half of the respondents i.e. 54 (51.9%) access the library website weekly.

Table: 2 Minimum level of Users' Expectations of LibQual items

Minimum Level	N	Mean	SD	Rank
Making information easily accessible for independent use	97	6.92	1.426	1
Willingness to help users	98	6.81	1.504	2
A library Web site enabling me to locate information on my own	95	6.75	1.695	3
Lib. Staff who understand the needs of their users	97	6.71	1.62	4
Readiness to respond to users' questions	96	6.67	1.751	5
A comfortable and inviting location	94	6.65	1.842	6
Lib. Staff who deal with users in a caring fashion	99	6.64	1.675	7
Easy-to-use access tools that allow me to find things on my own	101	6.59	1.505	8
Lib. Staff who are consistently courteous	100	6.58	1.724	9
Employees who have the knowledge to answer user questions	86	6.57	1.591	10
Print and/or electronic journal collections I require for my work	92	6.55	1.781	11
Electronic information resources I need	99	6.54	1.527	12
Printed library materials I need for my work	97	6.52	1.733	13
Modern equipment that lets me easily access needed information	94	6.39	1.699	14
Dependability in handling users' service problems	100	6.33	1.87	15
Library space that inspires study and learning	100	6.32	1.728	16
Quiet space for individual activities	96	6.29	1.698	17
Making electronic resources accessible from my home or office	101	6.27	1.783	18
Space for group learning and group study	89	6.26	1.793	19
Giving users individual attention	97	6.23	1.705	20
Lib. Staff who instill confidence in users	104	5.75	2.306	21
A getaway for study, learning, or research	96	5.72	2.242	22

Table 2 shows ranking of Minimum expectations for 22 LibQual items by the respondents. Making information easily accessible for independent use, willingness to help

users and A library Web site enabling me to locate information on my own items have expectations as the mean values were higher respectively. Library as a gateway for study, learning or research has very less mean values as Library as place is considered as necessary part of legal education.

Table 2: Desired level of Users Perceptions on LibQual items

Desired Level	N	Mean	SD	Rank
A library Web site enabling me to locate information on my own	95	8.46	0.769	1
Willingness to help users	98	8.43	0.908	2
Printed library materials I need for my work	97	8.42	0.977	3
Lib. Staff who deal with users in a caring fashion	99	8.36	0.897	4
Print and/or electronic journal collections I require for my work	92	8.36	0.99	5
Making information easily accessible for independent use	97	8.32	0.985	6
Electronic information resources I need	99	8.32	1.018	7
Employees who have the knowledge to answer user questions	86	8.31	0.885	8
Lib. Staff who understand the needs of their users	97	8.3	0.937	9
Readiness to respond to users' questions	96	8.28	1.102	10
Dependability in handling users' service problems	100	8.28	1.036	11
Easy-to-use access tools that allow me to find things on my own	101	8.26	1.197	12
Quiet space for individual activities	96	8.25	1.133	13
Lib. Staff who are consistently courteous	100	8.24	0.996	14
Library space that inspires study and learning	100	8.22	0.991	15
A comfortable and inviting location	94	8.15	1.209	16
Making electronic resources accessible from my home or office	101	8.06	1.384	17
Modern equipment that lets me easily access needed information	94	8.05	1.195	18
Giving users individual attention	97	7.99	1.254	19
Space for group learning and group study	89	7.78	1.594	20
Lib. Staff who instill confidence in users	104	7.78	1.264	21
A getaway for study, learning, or research	96	7.69	1.706	22

Table 2 shows the desired level of user perception on LibQual items. A library Web site enabling me to locate information on my own, Willingness to help users, Printed library materials I need for my work are perceived as most desired items for the respondents.

Table 3: Perceived level of Users Perceptions on LibQual items

Perceived Level	N	Mean	SD	Rank
Employees who have the knowledge to answer user questions.	86	7.9	1.117	1
Lib. Staff who are consistently courteous.	100	7.88	1.274	2
Modern equipment that lets me easily access needed information.	94	7.87	1.09	3
Lib. Staff who deal with users in a caring fashion.	99	7.85	1.181	4
Making information easily accessible for independent use.	97	7.82	1.061	5
Lib. Staff who understand the needs of their users.	97	7.68	1.195	6
Print and/or electronic journal collections I require for my work.	92	7.65	1.354	7
Printed library materials I need for my work.	97	7.62	1.262	8
Dependability in handling users' service problems.	100	7.61	1.497	9
A getaway for study, learning, or research.	96	7.58	1.116	10
Making electronic resources accessible from my home or office.	101	7.57	1.26	11
Willingness to help users.	98	7.53	1.325	12
Easy-to-use access tools that allow me to find things on my own.	101	7.5	1.293	13
Giving users individual attention.	97	7.48	1.422	14
Library space that inspires study and learning.	100	7.45	1.572	15
A library Web site enabling me to locate information on my own.	95	7.44	1.405	16
Lib. Staff who instill confidence in users.	104	7.41	1.174	17
A comfortable and inviting location.	94	7.34	1.663	18
Readiness to respond to users' questions.	96	7.33	1.506	19
Space for group learning and group study.	89	7.26	1.722	20
Quiet space for individual activities.	96	7.18	1.596	21
Electronic information resources I need.	99	6.94	1.596	22

Employees who have the knowledge to answer user questions, Lib. Staff who are consistently courteous. Modern equipment that lets me easily access needed information were received as most important items by the respondents which the library delivered to the users.

Table 4: Adequacy Gap Scores

(Perceived -Minimum level of Users Perceptions on LibQual items)

Adequacy Gap	N	Mean	SD	Rank
A getaway for study, learning, or research.	96	1.86	2.408	1
Modern equipment that lets me easily access needed information.	94	1.48	2.067	2
Employees who have the knowledge to answer user questions.	86	1.33	1.844	3
Making electronic resources accessible from my home or office.	101	1.31	2.292	4
Lib. Staff who are consistently courteous.	100	1.3	2.042	5
Dependability in handling users' service problems.	100	1.28	2.099	6
Giving users individual attention.	97	1.26	1.827	7
Lib. Staff who instill confidence in users.	104	1.24	1.493	8
Lib. Staff who deal with users in a caring fashion.	99	1.21	2.022	9
Library space that inspires study and learning.	100	1.13	2.373	10
Print and/or electronic journal collections I require for my work.	92	1.1	2.263	11
Printed library materials I need for my work.	97	1.1	2.074	12
Space for group learning and group study.	89	1	2.431	13
Lib. Staff who understand the needs of their users.	97	0.97	1.765	14
Making information easily accessible for independent use.	97	0.91	1.521	15
Easy-to-use access tools that allow me to find things on my own.	101	0.91	1.767	16
Quiet space for individual activities.	96	0.89	2.294	17
Willingness to help users.	98	0.72	1.843	18
A library Web site enabling me to locate information on my own.	95	0.69	2.048	19
A comfortable and inviting location.	94	0.69	2.12	20
Readiness to respond to users' questions.	96	0.67	2.306	21
Electronic information resources I need.	99	0.4	2.05	22

Table 4 shows that the library services were perceived adequate by respondents as no LIBQUAL items have negative scores.

Table 5 Superiority Gap Scores

(Perceived -Desired level of Users Perceptions on LibQual items)

Superiority Gap	N	Mean	SD	Rank
A getaway for study, learning, or research.	96	-.09	1.957	1
Modern equipment that lets me easily access needed information.	94	-.18	1.495	2
Lib. Staff who are consistently courteous.	100	-.36	1.243	3
Lib. Staff who instill confidence in users.	104	-.37	1.247	4
Employees who have the knowledge to answer user questions.	86	-.42	1.163	5
Making electronic resources accessible from my home or office.	101	-.49	1.927	6
Making information easily accessible for independent use.	97	-.49	1.119	7
Giving users individual attention.	97	-.50	1.56207	8
Lib. Staff who deal with users in a caring fashion.	99	-.52	1.445	9
Space for group learning and group study.	89	-.52	2.106	10
Lib. Staff who understand the needs of their users.	97	-.62	1.141	11
Dependability in handling users' service problems.	100	-.67	1.498	12
Print and/or electronic journal collections I require for my work.	92	-.71	1.745	13
Easy-to-use access tools that allow me to find things on my own.	101	-.75	1.203	14
Library space that inspires study and learning.	100	-.77	1.938	15
Printed library materials I need for my work.	97	-.80	1.455	16
A comfortable and inviting location.	94	-.81	1.731	17
Willingness to help users.	98	-.90	1.418	18
Readiness to respond to users' questions.	96	-.95	1.644	19
A library Web site enabling me to locate information on my own.	95	-1.02	1.368	20
Quiet space for individual activities.	96	-1.07	1.904	21
Electronic information resources I need.	99	-1.38	1.822	22

Table 5 shows the superiority gap, which refer the service quality of library provisions. Negative scores were obtained across all the Libqual items, which shoes there is shortfall of library service quality. Further the minimum, desired and perceived level mean scores were plotted on the scatter diagram to show which particular items has the maximum gap.

Table 6: Correlation between Overall Users satisfaction and LibQual dimensions

	ASPER	LPPER	ICPER	PER
Overall User Satisfaction	.421**	.421**	.485**	.498**
	.000	.000	.000	.000
	104	116	116	116
**. Correlation is significant at the 0.01 level (2-tailed).				

Pearson correlation measures the correlation between two or more variables. Table 6 shows that all the LIbQual dimensions (i.e. AS, LP and IC) at perceived level were positively correlated and hence related with the user satisfaction. Among all the dimensions, IC (which represents the library collection and information resources) has the highest correlation (r=0.485) with user satisfaction at the 0.01 significant level.

Table 7: Regression Analysis

Model	**R**	**R^2**	**Adjusted R^2**	**Std. Error of the Estimate**	**F Change**	**Sig. F Change**
1	.485[a]	.235	.228	1.329	31.383	**.000***
a. Predictors: (Constant), ICPER						
Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.108	1.161		.093	0.926
	ICPER	.858	.153	.485	5.602	0.000

a. Dependent Variable: Overall Users Satisfaction

The impact of independent variables i.e. LibQual dimensions i.e. AS, LP and IC on dependent variable (overall user satisfaction) was determined via multiple regression analysis in table 7. The adjusted R^2 = 0.228 accounted for 22.8% variance in dependent variable is explained by the independent variables. Significant value is set at 95% significance level. Hypotheses were investigated to check the impact on user satisfaction by LSQ dimensions. IC has highest standardized beta coefficient value i.e. 0.858 signifying that it predict overall user satisfaction with library services.

8. Findings and Conclusion

The study carried out to LSQ assessment at NLS, Bangalore. The findings of the study revealed that 88.4% of the total respondents physically visit the library daily or weekly and more than half of the respondents i.e. 54 (51.9%) access the library website weekly. The most desired LibQual item was A library Web site enabling me to locate information on my own. (8.46) followed by Willingness to help users. (8.43), Printed library materials I need for my work. (8.42) and so on, but perceived service level of LibQual items differs from the desired service level. Employees who have the knowledge to answer user questions. (7.9) followed by Lib. Staff who are consistently courteous. (7.88) and Modern equipment that lets me easily access needed information. (7.487) were ranked high in the perceived service level. The significant difference in perceived and desired service level was noted among most of the Libqual items in all the three LibQUAL dimensions. Moreover the maximum gap was found in the IC dimension. The study also finds that the respondents were satisfied with services rendered by the library. Information control dimension, which represents the library collection and information resources determine the maximum degree of overall user satisfaction. Regression analysis also revealed that perceived level of IC significantly predicts the degree of user satisfaction.

On the basis of findings, there is need to make efforts to improve the affect of service dimension and Library as a place, which consists of item related to library staff and their interaction with respondents. The findings of LibQUAL survey can help the library to emphasis on the areas, where improvement is required. The regular assessment of library service quality can serve the library administration to evolve a strategic planning for library services to meet the user needs effectively.

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Mobile Technology in Academic Libraries

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Abstract: In modern era majority of the students, researchers and faculty members are having their own mobile devices that they use to access the internet on a regular basis. Libraries can harness of this trend by incorporating the Technology in to various types of Library services such as information, resources, orientation, circulation, reference, user instruction and marketing. Universities across the nation are utilizing a variety of Technologies like applications, QR (Quick Response). Mobile technology has now come up with "Libraries in hand" trend in the Google Era.

Keywords: ICT, Mobile Technology, Academic Library Services, Mobile library Web Site,

1. Introduction

Mobile Technologies have made communication and information access very convenient and timely to users, the adaption of Mobile Technology alerts the traditional relationship between libraries and users. Laptop, Net books, E-Readers, Tablets, and Capable Handheld devices are some of the many types of Mobile Technology currently flooding the market .It is important for the Academic Library to look at how many Students own each type of Technology and how students use their Mobile devices to locate and retrieve information Juxtaposing this information with current library operation allows the library to align services behavior and expectations.

Mobile devices and services offer tremendous flexibility for those who want to take advantage of library services. With a simple 3G connection, a user lying on a beach can access e-books and multimedia content from a local library. Smart phones can access networks and content can be continually streamed over a network, providing content on demand and making it unnecessary to maintain a paper copy of the material. Google is developing for mobile first and the desktop second. Apple is in the midst of making its desktop computers behave more like its mobile devices. Aside from offering convenience, mobile technologies present new opportunities for libraries to promote access and expand reach.

2. Importance of Mobile Technology

Mobile access to library resources is not a new concept; in fact, the first project designed to deliver handheld mobile access to library patrons began eighteen years ago, in 1993, the time of mainframe computers and Gopher. The "Library without a Roof" project partners included the University of Southern Alabama, AT&T, BellSouth Cellular, and Notable Technologies,

In Google Era Mobile phones have become the essential part of human life for Information and communication and it also helps to student in E-learning. Mobile technology has changed human behavior history. It allows us to stay connected regardless of our geographical location. The implications of this are huge: not only it is incredibly convenient to be able to make a phone call wherever you are, but it's also crucial to be able to make a phone call when you need to most; namely, during an emergency situation. Because of this, mobile technology has literally saved lives. Besides these obvious implications, there are also more subtle ways by which mobile technology has helped mankind. Consider that mobile devices are commonly used in the medical industry to enhance and simplify how things are run.

We owe a great deal of gratitude to mobile devices. Through phone calls, SMS messaging, mobile Internet browsing and many more avenues, we've been able to stay connected as a society and keep in touch both in times of relaxation and in times of need.

3. **Mobile Websites**

In addition to or in place of Mobile Application, some companies and Organizations also develop mobile version of their web sites that are better optimized for viewing on mobile devices. Some Mobile websites are as follows:

- **Encyclopedia Britannica Mobile:** Offers a search box and a list of suggested searches. Results include full-text entries with enlargeable images. Access: http://i.eb.com/.
- **Medline plus Mobile:** Produced by the U.S. National Library of Medicine, Medline Plus Mobile provides information about specific diseases, conditions, and wellness issues. The site also contains prescription drug information, medical dictionary, and current health news. Access: http://m.medlineplus.gov.
- **WorldCat Mobile:** Search the WorldCat catalog for books, movies, music, games, and more. Results include items available at local libraries. Access: http://www.worldcat.org/m.
- **Boopsie:** Specializing in public and academic libraries and universities, Boopsie can deliver mobile applications that are compatible with all Web-enabled phones. Contact the site for a price quote. Access: http://www.boopsie2.com/.
- **Android Developers:** Resources for creating Android applications. Includes developer's guide, tutorials, and videos. *Access:* http://developer.android.com
- **AirPac (Innovative Interfaces):** Offers a mobile version of the Innovative Interfaces (III) library catalog. Includes features such as cover images, integrated library locations with Google Maps software, request and renew items, and more. Contact Innovative Interfaces for pricing. *Access:* http://www.iii.com/products/airpac.shtml

- **Library Anywhere:** Created and sold through Library Thing, Library Anywhere is a mobile catalog for any library. Includes mobile Web and apps for iPhone, Blackberry, and Android. Prices range from $150 annually for schools to $1,000 annually for universities (additional fees may apply). Access: http://www.librarything.com /for libraries.
- **INLU Library:** Recently to launch ILNU Library Mobile App on 23rd January ,2016.so user can be connected With Us by 24/7 on any smart phone (Android)or Tablet .now any user can access and to get the information from out site of his campus. Started from your mobile device Download ILNU Library from your Android visit the Google Play store. And Search your Information.

4. **Examples of mobile library Websites**

- **Adelphi University Libraries Mobile (AU2GO) :** Offers library hours, library staff contact information, a link to the library's blog "biBLIOGraphy," and more. Access: http://m.adelphi.edu/library/.
- **Albertsons Library, Boise State University:** Simple text navigation offers various ways to find the library and its contents. An interesting feature is the inclusion of a "Find in Our Building" category, which lists call number locations and popular locations such as study rooms and computers, each linked to an animated floor map. Access: http://library.boisestate.edu/m.
- **North Carolina State University (NCSU) Libraries:** Elegant interface with icons representing categories such as room reservations, group finder, and Webcams. Another interesting feature is the ability to view the number of available library computers. Access: http://www.lib.ncsu.edu/m /home/?browse=iphone.
- **Libraries to Go: Mobile Tech in Libraries:** Comprehensive Slideshare presentation that reviews how libraries can use and develop mobile technologies. Access: http://www.slideshare.net/ellyssa/librariesto-go-mobile-tech-in-libraries-presentation.
- **Library in Your Pocket:** Strategies and Techniques for Developing Successful Mobile Services. Mobile site developers from North Carolina State University Libraries share techniques for creating and promoting mobile services
- Access: http://www.educause.edu/Resources/LibraryinYourPocketStrategiesa/195003.

5. **Mobile Technology Devices:**

- Laptop and Computers
- Mobile phone and Smart phone
- Global positioning System (GPS) devices
- Wireless Debit/ Credit card payment terminals

Mobile devices can be enabled to use a variety of communication Technology such as:

- Wi-Fi (wireless Fidelity): It is a type of wireless local area net work technology.
- Bluetooth: It is connect mobile devices wirelessly.
- 3G. (Third Generation): Global system for Mobile communication (GSM) and general packet radio services (GPRS).
- Data Services: Data net working services for mobile phone
- Dial- up services : Data net working services for mobile

6. Mobile Technology and Academic Library Services:

Mobile Technology can be applied in Libraries providing variety of Services. Learning mobile technology can be very efficiently used. As the strength of Libraries is in supporting self directed and independent learning libraries could play an increasingly important role in this mode of learning libraries could Provide access to resources tailored to mobile devices and services to guide user in their self directed learning effort. Academic Library is a central place of study and research, It is not mere Storehouse of book but it a dynamic instrument of Education .Mobile Technology Library Services is below:

- Mobile Library Site
- Mobile on-line Public Access catalogue (MOPAC)
- Circulation Service
- Reference Service
- Current Awareness Service and selective Dissemination Service(CAS&SDI)
- E-mail and SMS Service
- Distribution of E- Resources though site
- Library Maps and Floor plans
- Library news events blogs
- Library Hours and Library tours
- Mobile data bases
- Inter library loan service
- List of new Arrivals
- Books and Articles search
- Library Instructional program through mobile site
- Subjects guide, path-finders etc.
- Photo /Video gallery

- Feedback /comments/suggestions
- Contacting library staff for help

7. Advantages Of Mobile Technology in Libraries

- **User Friendly:** Familiarity with their own devices and technology helps the users in accessing information quickly and does not require orientation and training. Mobile users are using the facilities on mobile phones like SMS, instant messaging, web browsing, e-mail effortlessly to communicate. Most of these features are pre-installed on mobile devices or option for data plan packages.
- **Time Saving:** Users need not record information about resources while browsing and searching library resources or wait at library transaction counter to renew/reserve books and hence the time of the user is saved.
- **User Participation:** Libraries can enrich OPAC by allowing users to incorporate user created content like notes or images uploaded by users.
- **Location Awareness:** Mobile communication enables libraries to offer location-based services/content through global positioning system (GPS) capabilities. Libraries can guide the users to the location of specific document or service through maps and navigational tools.
- **Personalized Services:** Personalized service helps users to interact with library staff to seek specific information or reference away from library.
- **Ability to Access Information:** Information access from anywhere at any time will be of great help for users who cannot visit library in person and provides a constant link to required information resources.
- **Limitless Access:** All online resources accessible on their desktop also become accessible through mobiles.

8. Conclusion

In Google Era Mobile Technology are rapid, dynamic services of information and communication in Academic Libraries. Mobile Technology is currently available in Academic Library and in development can be overwhelming to an Academic Library trying to engage students. Technology will continue to impact every area of the academic Library, from orientation to marketing as students increasingly move toward Internet capable Handheld Devices. In this way Mobile Technology is easy, faster and useful tool of Information Communication Technology (ICT) for Academic Libraries.

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ABSTRACT

The library is a growing Organism. It is always subject to many changes in its scope and size but the expansion in size is restricted because of many limitations. Thus with the constant revision of collection policy, computerised library services and optimum use of latest technologies may keep library always as a place of learning and alive.

INTRODUCTION

The public, academic and special libraries are considered to be the busiest places of the town, university or the research institute. The academic libraries are considered to be the most important learning centre of the institution – both symbolically and in terms of its physical placement. In the Information Age, the information is the key ingredient for the development and prosperity of any nation. Thus Information turns into knowledge and evaluated and assimilated knowledge is converted into wisdom. This transformation from information to wisdom takes place in the library. From very ancient times systems and space for conserving and disseminating knowledge is prevalent though they were not named as library or archive. The Men illustrated his experiences on the walls and other safe places for future generations. Media for recording knowledge under gone changing from cave wall to stone, clay tablets, metal sheet, palm leaf, paper to digital media real and virtual. Similarly, the library space also evolved with facilities and systems to manage these changes from prehistoric to the modern age digital collection.

The renaissance led to the invention of printing and the wide distribution of knowledge and ideas. The spread of education brought in numerous educational institutions like Oxford University, and libraries were developed as their central hub to acquire and manage documents that support their activities as well as to manage and conserve the knowledge generated there. The invention of printing led to the explosion of printed material which flooded in the libraries, causing the problem of storage space even in the magnificent beautifully designed library buildings . During the last century libraries, regardless of size have to double their stack at least in every ten years. In addition to the printed books and documents the other formats like audio – video tapes, gramophone records, microfilms, CDs and digital documents also got their presence in the libraries. The developments in ICT have now brought in new digital media and all these developments have reduced the working space in the libraries and the diminishing exercise is going on uninterrupted because of rapid growth of digital or non book material along with the printed documents. The libraries are hybrid in nature having traditional printed documents and digital or paperless documents. Thus in the hybrid libraries the problem of space management is emerging rapidly and the top priority to be given for its solution.

The University library is the biggest library system in the academic libraries. These libraries serve the purpose of study and research activities of the university. Thus the users in these libraries are students of UG, PG

and research courses of M. Phil./ Ph. D. The teachers also engage themselves in research, in addition to the normal teaching. Therefore, these users expect many more facilities in the University library building other than the reading space. The need of such facilities is because of their longer time stay in the library building and shrinking or scarcity of reading space at the residences in the urban areas. The spacious kothis or Banglows now have been converted into multi story flats without any free space to be used by the students individually.

Further, the students and researcher need some involvement into groups to discuss and clarify his/ her doubts in course of study and research. These Non-library facilities refer to those facilities which were not part of the library in the past decades but became a part of the library in the recent times . These facilities are considered useful to the researchers, because these non-library activities are giving a feel of responsible belongingness, which promote transformational character of intentional learning at the library. These are commonly known non-library facilities.

In earlier days the libraries were expected to provide the library services to the users. The library Services means traditional services of Reference, circulation, Reading Room and reprographic services to the users. The advent of ICT in libraries has changed the concept of services provided to the users. Instead of manual traditional services of Circulation, Reference and reading room the users expect many more services in the libraries. Though these services may not be called as library services but the matter of the fact is this that they are the need of every library to hold its importance in the academic world. These services are: - General computer lab(s); Snack bar or cafe; Classrooms for general use; Conference/meeting rooms; Auditorium; Tutoring centre; Archives; Bookstore; Photocopy/Xerox; Academic department(s); Art gallery or museum space ; Exhibition area; Video watching room; Audio room; CD/DVD library; multimedia centre; News watching facility; Writer's cabin; Incubator (Thinking Cell); meditation/assimilation room. In other words it may said that the library should have Space for Discussion among friends, Open Space for Refreshing after long deep study, Room for Presentation through IT for students, Seminar Room for librarian, Multimedia Room for screening films and presentations by library staff, Cafteria, Toilets, Drinking Water and cozy interior with natural light and proper Ventilation of air, Silence Zone for Reading with air conditioning and IT resource centre.

Thus on the basis of the above stated facilities the library is considered to be place for many activities. It is a meeting place with the friends and socialisation . It is a place where people come together which is difficult in hostles, class room or off campus location. The students on entering in the library want to be the part of the richness of tradition of scholarship as well as its expectation to the future. Thus library is a place for community and contemplation. In addition to it the library also serves as a place of reading and relaxing in safety and in quite. It is also used for day dreaming, thinking experiences of intimate moments in students life.

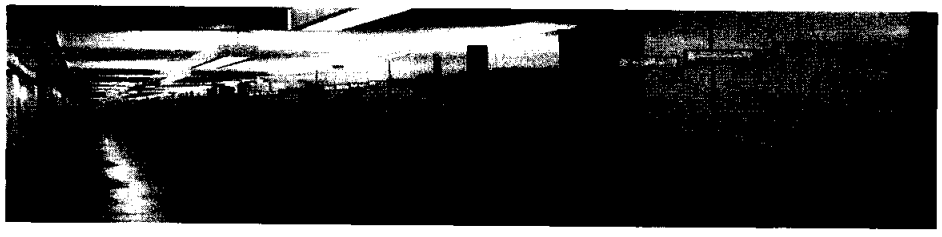
The problem discussed above for redesigning the library space in the changed context of users need may be addressed in two ways:-

OPTIMISATION OF AVAILABLE SPACE FOR TRADITIONAL LIBRARY SERVICES

There are ways by which space can be optimally managed in the library:

Compact Shelving

Movable compact shelving is shelving that is mounted to a wheeled platform (carriage) that rides on tracks placed on or in a floor. Being moveable, ranges of shelving can be massed or "compacted" in order to utilize space normally consumed by aisles. Ranges are moved to create an aisle only where one is needed. This gain in space efficiency is the purpose of movable compact shelving. Carriage operation may be (1) manual; (2) mechanically assisted manual; or (3) electrical. Shelving may be cantilever-type ('library type') or case-type (four-post), and may be of steel, wood, or a combination of the two materials. The specific way these basic systems are executed differs from manufacturer to manufacturer, but these are the basic options available to the prospective buyer. This concept of compact shelving can create a huge space for the other activities in the library like space for learning, social spaces etc.

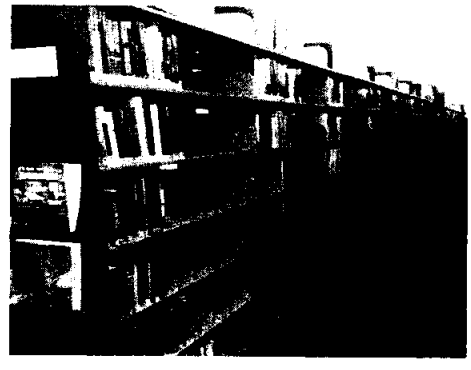


Weeding Out Policy

Weeding is necessary to prevent a library collection from becoming obsolete. At the same time, weeding is necessary because a library has limited physical space. It is simply not possible for a library with limited space to collect and to house all print and electronic materials.

Libraries should aim at the periodic weeding out of obsolete material. If the latest edition of a book is available in the library collection and the book is NOT HEAVILY USED according to the issue record slip. All old and superseded editions of the book should be withdrawn. Up to a maximum of two copies of the same edition may be kept in the library collection. Textbooks may be weeded out if they are no longer part of the present curriculum at the University; Their contents have become obsolete (e.g. computer science books); They are more than 5 years old; Consent of the concerned academic departments is obtained; All worn-out, mutilated volumes should be withdrawn from the library collection.





Thus depending upon the policy of the institution weeding out of books in the library on periodic basis can help in creating space in the library for current collection.

Fixing the Optimum Limit

Every library building should be designed with certain standards and should store an estimated number of volumes. and the optimum number can be fixed, then the policy of the library should be to move cautiously in its acquisitions so as not to cross the optimum limit. Every library should frame policy in this regard and while designing the stack area, a decision on the optimum limit of the collection to be housed must be taken.

Digitization of Books

With the use of technology and digitisation sufficient space can be created in our libraries. All rare books and very old multiple copies of books should be digitized and preserved for future. And this would create space for future collection as well for other learning activities in the library.

Acquisition of E-Resources

The library should prefer the e-resources rather than the printed documents for its collection.

REDESIGNING AND PLANNING OF LIBRARY SPACE FOR NON- LIBRARY SERVICES

Expendable Architectural Design

The libraries are dynamic in nature, the spaces that define them and the services they offer must continually stimulate users to create new ways of searching and synthesizing materials. Although certain principal design elements—such as the articulation of the perimeter wall, the introduction and control of natural light, and the placement of core areas for stairs, toilets, and heating, ventilation, and air conditioning—will remain relatively constant, the majority of space must be capable of adapting to changes in use. If this is to happen, a number of fundamental considerations must be addressed.

In the past, expanding collections reduced user space; now, it is just the opposite. Despite careful planning to define specific space requirements for the collaborative research functions identified by the users, technology evolved much more quickly than could be anticipated, and what we thought to be cutting-edge spaces were out of date within the year. The demand for more and more space is beyond any expectation. Thus space for the learning and research of tomorrow must be generically conceived and delivered, using construction techniques and infrastructures in imaginative ways that are readily adaptable to reconfiguration.

Large, open spaces are to be designed and reconstructed so that they could be reconfigured to fulfill future needs. Enclosed areas for conference rooms, private and semi -private offices, seminar rooms, and group study

rooms were planned so that in the future, these spaces could be incorporated into the open reference and computing commons area. Library should have an open space for vertical as well as horizontal expansion in order to meet future needs.

Library can be made the only centralized location where new and emerging information technologies can be combined with traditional knowledge resources in a user-focused, service-rich environment that supports today's social and educational patterns of learning, teaching, and research. Whereas the Internet has tended to isolate people, the library, as a physical place, can do just the opposite. Within the institution, as a reinvigorated, dynamic learning resource, the library can once again become the center-place for establishing the intellectual community and scholarly enterprise.

The effective utilization of library space to make the collection and services of the library transparent to the user will make them more frequent library user. Rather than hide resources, the library should bring them to the user, creating a one-stop shopping experience. Whether users access e-mail, digitized resources, or special print collections, or are reformatting and publishing a paper, the library should be the place to enable them to advance their learning experiences.

CREATING LEARNING AND SOCIAL SPACES IN LIBRARY

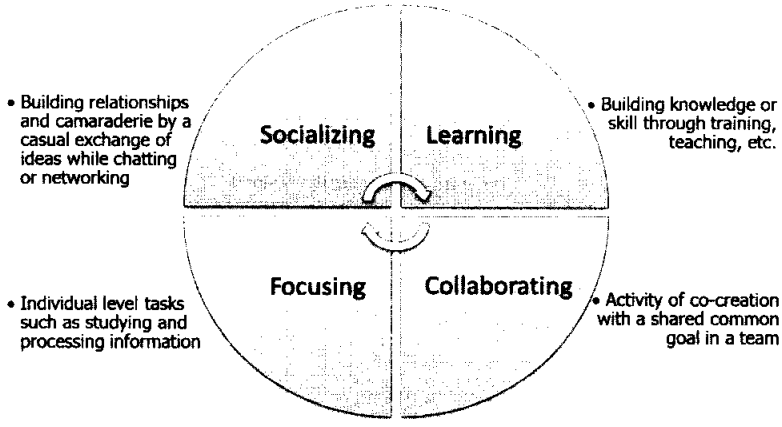


Fig. 1 Four Work Modes in Knowledge Workplace. Adapted from "SECI, Ba and leadership: A unified model of dynamic knowledge creation," by I. Nonaka, R. Toyama, and N. Konno, 2000, Long Range Planning, 33, p.12. Copyright 2000 Elsevier Science Ltd.

Appropriate noise levels, natural lighting, and where along a continuum from overly sterile to overly distracting the space falls are factors commonly cited as important to students looking for good spaces to study and learn. Even quiet study seems to require space that "fosters a silent exchange of energy," since all study is active

(Ranseen 2002). Studying "along" rather than studying "alone" describes the communal nature of even individual study in the library. Collaborative learning also benefits from open but defined spaces, where students can adjust tables and seating and make use of technology, like smart white boards and wireless access. Entire floors can be allocated to collaborative learning, and group study does not require enclosed rooms dedicated specifically for that purpose. One key to an effective space plan is to align use with the natural strengths of a given space thus our libraries are to shifted from collection centered to learning centered libraries. Therefore, more space should be re-designed/created for the following work modes in knowledge workplace.

Focused Study Space

Students & faculty require individual study spaces in the library for focused study. And for this purpose libraries should create separate study carrels with desks and power points.

Collaborative Study Space

A collaborative study space is the space that lets students quickly and electronically shares concepts with other student team members and faculty. The study area includes casual, flexible seating for informal learning, as well as whiteboards, laptop power ports, LCD screen, projector and wireless networking availability.

Learning Space

Library should create a space for students and faculty which help them in building knowledge and skill through training, teaching etc. The space should include the minimum infrastructure like tables, chairs, laptops, projectors etc.

Socializing Space

Although creating a space for social activities in academic libraries is not easily acceptable. But these kinds of spaces in the library help students and faculty to become familiar with each other and gain trust among them. This would help them to exchange ideas between them while chatting and discussing.

CONCLUSION

The facilities stated above are desirable not only in the University library building but they are sought by the users in public as well as in special libraries. The Library is a Growing Organism. Therefore, its quality growth is possible on the basis refinement, realignment and redesigning for satisfying the Users Optimally.

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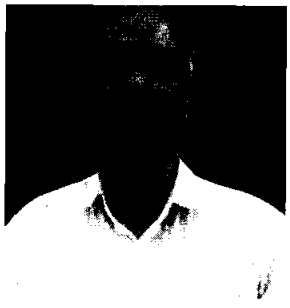
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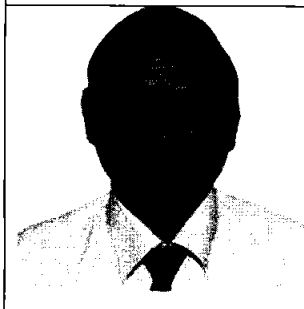
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Authors Profile



Dr. Dharam Kumar presently working as Librarian in Aryabhatta College formerly Ramlal Anand college (Evening), University of Delhi, obtained his Ph. D in LIS from University of Delhi. He has contributed many research articles in the peer reviewed journals of International repute. He has participated and contributed research papers in several national and International Conferences. He is life member of ILA and after being the member of Executive Committee of Delhi Library Association for almost one decade, served as General Secretary for 2011 - 2013, currently he is council member of Indian Library Association.
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Quick Response (QR) Code and its Impact to access E-Resources in the Central Library of ADTU

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Abstract: QR code is a two dimensional bar code and it is an optically machine-readable label attached to an item which contains the records of information related to their item. QR codes helps to make the library services more friendly and attractive to their readers. This could be used in libraries as paper free labels, library identity cards, and for acquiring information from librarian, library instruction and also for marketing of information around the campus. But the users should have the facility of camera and web capabilities in their mobile phones such as android, iPhone, Windows, Black Berry etc. This paper provides basic information of QR codes and its impact to access the open access e-resources in the central library of Assam Down Town University. This paper also finds the students attitude towards using QR codes and its barriers to access the QR Code in the central library.

Keywords: QR codes, Quick Response, 2D barcode, Barcode, E-Resources, ADTU.

1. Introduction

QR (Quick response) code is a type of Bar code which was originated from Japan. The idea of QR code was development in 1994 by Denso Wave incorporated a Toyota subsidiary in Japan. QR codes are two dimensional bar codes that can be read by QR code reader or smart phones. The codes were accepted internationally between the year of 1997 and 2004. According to the official website of Denso Wave, QR code not only has high capacity but can also store many different types of information. The QR code is an optically machine readable label that is attached to an item and that records information related to that item. The information encoded by a QR code may be made up of four standardized types or modules. A QR code is a unique looking image that can be scanned with a camera and translated into a website address, text contact information etc. QR code readers can be downloaded to mobile devices, the mobile devices should have the facility of camera and web capabilities such as Android, iPhone, Windows, Black Berry etc. The Apple App Store, Google Play Store, and Amazon App Store all have a variety of free and low-cost QR code reader apps.



Fig 1: Specimen of a QR code

2. Comparison with Conventional Bar code (1D)

The main Comparison between a QR code and a traditional Bar code is that QR code contains information in both the vertical and horizontal direction, while a Bar code contains data in one direction only. The typical Bar code hold a maximum of 20 digits while the maximum data capacity of a QR is 7089 character for numeric data, 4296 character for alphanumeric data, 2953 bytes for binary data and 1,817 character for Japanese Kanji and kana data. Fig 2 shows the difference between a QR code and Bar code.

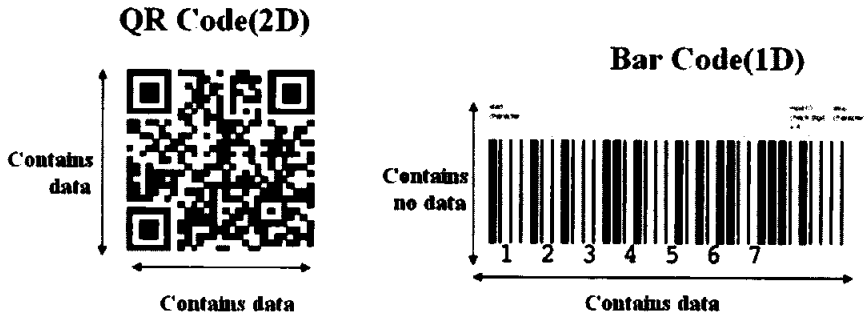


Fig 2: Comparison between QR Code (2D) and Bar Code (1D)

QR code is faster to read than other Bar code because it contains three large square patterns in the corners that are used for position detection.

3. Structure of a QR Code

QR Codes were developed in 1994 by Denso Wave, Toyota subsidiary as a matrix code to maintain information in two vertical and horizontal dimensions. QR codes were introduced freely as a method for qualifying shelving in production units in 1994. These codes are in line with the international standards of ISO/IEC 18004. The QR code typically appears as a small white square with black geometric shapes. The size of a QR code vary from 21x21 to 177x177 cells by 4 cell-increments in both horizontal and vertical direction. The QR Code is composed of five areas i.e. Finder Pattern, Alignment pattern, Timing Pattern, Quiet zone and Data area. Figure 2 shows the areas of a QR Code.

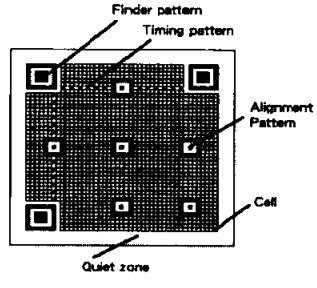


Fig 3: Structure of a QR Code

- **Finder Pattern:** Finder Pattern refers to the big squares on three of the four corners of a QR code symbol which is used to detecting the position, the angle and the size of QR Code.
- **Alignment Pattern**: The alignment pattern is used to correcting the distortion of a QR code. It can also be used to identify whether the QR Code contains nonlinear distortions. For this purpose an independent black cell is placed in the alignment pattern.
- **Timing Pattern:** Timing pattern is consists of black and white cells in horizontal and vertical lines that connect the three finder pattern squares. It is used to determine the central coordinate of a symbol, so as to make sure a symbol is fixed and can be read correctly without distortion.
- **Quiet zone**: This is the blank area around the QR Code which makes easier to detect the QR code. The width of quiet zone is usually consists four or more cells.
- **Data area:** The QR code data will be stored in this area. The data in QR code will be encoded into the binary numbers of 0 and 1 based on Reed- Solomon codes to provide error correcting functionalities.

4. How QR Code Generated

A QR code is generated with QR code creation software and a specialized QR code printer used in conjunction with QR code scanner. A user takes a picture of the QR code using a camera, usually on a smart phone to access the data stored in the code. Then, the image is processed using a QR code reader (smart phone application). Most QR code applications are compatible with major cell phone providers.

There are various QR Code creations Software available in the website which is free of cost, generated easily and quickly. The QR code generator software provides the QR codes of the following content type.

- Text
- URL
- Email
- Phone Number
- SMS
- Contact
- Geo-location

5. Impact of QR code to access E-Resources in the central Library of ADTU:

A. Open Access Free E-books/E-Journal/Databases

Name of E-Resources with QR Code

Directory of Open Access Book

Digital Library of India

Universal Digital Library E-books

Directory of Open Access Journals

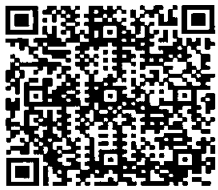
Indian National Science Academy

Indian academy of Science

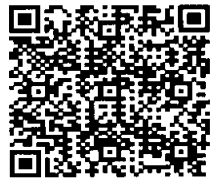
NISCAIR Research Journals-India

National Centre for Biotechnology inf.

Bioline International



BioMed Central



HighWare Press



Journal of Digital Information(JoDI)



Molecular Diversity Preservation International



ERIC Database



PubMed Central



Med India



B. Learning Resources and Course Materials:

Name of E-Resources with QR Code	
National Program on Technology Enhanced Learning	IGNOU course materials
e-Pathashala-Gateway to all PG Courses	Science and Technology- Lecture note, Audio& Video
Ulah state open Courseware	Commonwealth of Learning
MIT Open Courseware-Free Online Course Materials	Khan Academy

TOEFL	

C. Career Information Resources:

UGC NET Exam

CSIR-UGC NET

Spoken Tutorial- NMEICT, MHRD

APSC

Indian Administrative Services(IAS)

Bank Exam and others

Employment News



Competitive Exams



Exams to Win- practice & Gain



Gyan Josh-Online Solution



Jagran Josh-Complete



Competition Career



Competitive Exam Career



6. Student's attitude towards using QR Code:

The students were asked to indicate the attitude towards using QR code. The questions were asked to 50 students of Assam Down Town University those who have the facility of camera and web capabilities in their mobile phones.

Table 1: Student's attitude towards QR Code

S.No	Attitude	Response(N=50)	% of Response
1	It easy to use	44	88
2	It saves the time	39	78
3	It gives proper guidance	45	90
4	Its shows accuracy	42	84
5	Its shows reliability	38	76

Table 1 showed that the highest 90 percent of the students mentioned that the QR code provides proper guidance, 88 percent of the students mentioned that QR code easy to use, 84 percent mentioned that QR code shows accuracy, 78 percent replied that it saves time and the 76 percentage replied that QR code shows reliability.

7. Barriers to use QR Codes in the library

The Students were asked whether they faced any problem while using QR code in the Library and responses are summarized in the Table 2.

Table 2: Barriers to use QR code

S.No	Barriers	Response(n=50)	% of Response
1	Low internet facility	06	12
2	Lack of Technical support	21	42
3	Lack of awareness of E-resources	29	58
4	Lack of training in E- resources	41	82
5	Lack of support by Library Staff	04	8

Table 2 showed that 82 percent of the students faced problem due to lack of training in E- resources, 58 percent of the students due to lack of awareness of E-resources, 42 percent due to lack of technical support, 12 percent due to low internet speed and very least percentage i.e. 8 percent of the students due to lack of support by the library staff.

8. Conclusion

QR code is an open format and can be store quite complex information in a small matrix form. Compare to other barcode which have to depend on physical scanner, QR code can be easily detected by a mobile devices. The mobile phones should have the facility of camera and web capabilities with decoding software. The library professionals must be expert on implementation of QR codes in libraries so that he or she can give the proper orientation how to use the QR code in library. The adoption of latest technologies has depends on the sufficient ICT infrastructure with sufficient library manpower. The design and production of a large number of codes is time-consuming but if the sufficient staff available in the library it can fulfils the desire of adoption new technologies. This new technique helps to attract the library user as well as helps to fulfill the requirements of information.

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Author Profile

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Technology Adoption and Adaptation in University Libraries in India: Librarian's Perception

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Abstract: This paper examines the drivers of technological change and the areas of library operations, collection, services, infrastructure and superstructure, where the technological change has taken place or taking place. This paper provides some insight into the technology adoption and adaption in the Indian university libraries and the problems faced by them in managing it. Some strategies for effectively managing technology are also discussed.

Keywords: Academic libraries, Technology adoption, Change management..

1. Introduction

Educational institutions around the world are undergoing a radical change and the Indian university libraries no longer remain an exception to this. Today academic librarians are facing much challenging work-environment where change is driven by technological innovations, growing client expectations, shifts in government policies and financial pressures. The privatisation of higher education in India has already led to an increase in the competition among different universities. Further, as the government is fully geared to allow the entry of foreign universities into India, this competition among higher education service providers will become tougher in the near future and the job of university libraries will become all the more challenging. In such a competitive environment the user has become more demanding, thereby imposing a threat to university libraries which put up resistance to change.

The amount, diversity and speed of information available through the state-of-the-art technological developments, have forced the libraries to change the mode of services and operations for the benefit of library users. On the one hand changes bring about growth and experience, but on the other hand, there is strong resistance to changes (Siddiqui, 2003). The challenge for librarians, therefore, is how to control and implement the change-process (Curzon, 1989; Diedrichs, 1996). Unprecedented change in scholarly communication, management strategy, global connectivity, and rise in digital libraries constitute a very short list of major trends that make information work in higher education a fascinating and challenging prospect (Tucker, 2000). Library philosophy and practice have shifted from purchasing materials and offering services "just in case" to "just in time". The cost of access appears to be more affordable than the cost of ownership, though it comes with the accompanying risk of loss if no one purchases or preserves an item (ending the viability of interlibrary loan) or if no one archives or converts digital collections to the new formats and platforms that the future will bring. The widespread adoption of technology and reduced barriers to its access accounts for these trends and also for the speculation that the digital divide is disappearing (Singleton and Mast (2000).

To cope up with these problems greater managerial skills are required. The participative management, proper and timely communication, "top down" to "bottom up" managerial style are required. Continuous training is needed to maintain employment prospects in an increasingly competitive workplace. Librarians must adopt the idea of a user-centered culture. The library managers should bring about these changes in such a way that these are evolutionary ones and not revolutionary ones.

2. Technological Change

Literature related to librarians' views of technology is expressed in terms of attitude to technology adaptation/adoption to change. For the successful implementation of technology, staffs' attitude needs to be positive to ICT (Fine, 1986; Evald, 1996). The negative attitude of the staff can be changed into positive with proper training and external education programmes. All this helps in increasing individual's knowledge about the technological skill and reducing attitudinal barriers to the acceptance of technology (Igbaria et al., 1997; Bhattacharyya, 2005). Successful training needs to appreciate that staff have different needs and so prefer different training methods. Resistance is also a natural response to change that managers should note and attempt to understand, if and when it occurs (Spacey et al, 2003).

3. Objectives of the Study

- To identify the key drivers of technological changes in Indian university libraries.
- To identify the ways adopted by university libraries to adopt and adapt to technology.
- To find out challenges and problems faced by librarians in managing technological changes.

4. Scope of the Study

This study was limited to general universities from North-West region of India that were at least twenty years old. Those universities had been given preference that have initiated or successfully implemented change in their outlook, work system, and services and the changes were visible. Only state general universities excluding agricultural, engineering, medical, open and technical universities were covered. In the present study Chandigarh, Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab and Rajasthan is included in the North-west region of India.

5. Methodology

Questionnaire method was used to obtain information from the chief librarians/ section heads. A total number of 70 questionnaires were distributed personally to chief librarians as well as section heads in university libraries. A total of 63 (90%) questionnaires were returned and considered usable. The data were analyzed using simple percentages and frequencies.

6. Results and Discussions

- **Drivers of Technological Change:** Nearly all (98.4%) respondents indicated Information and communication technologies (ICTs) as the main driver of change, Most of the respondents (95 percent) indicated e-resources as a driver of change, More than four- fifth of the respondents(80.9 percent) considered users' needs and expectations as a driver of change in the university libraries. Apart from these, management policies, knowledge-management, shrinking budget, physical space, government policies, cultural change, globalization and privatization were other key-drivers of technological change identified by the respondents. More than one-third of the respondents (36.5 percent) were of the view that the university libraries in India had been undergoing major technological change for the last 3 to 5 years.
- **Areas of Change:** A visible change had been observed in different areas of the libraries such as e-collection, reference service, OPAC, technology as well as rules and policies. Most of the respondents (85.7 percent) indicated that e-collection had undergone major change in library collection. More than two-third (68.3 percent) were of the view that reference service had undergone major change in the area of library services; Nearly two-third (65.1 percent) indicated that libraries were acquiring new technologies to improve their services; More than half (63.5 percent) were of the opinion that libraries were undergoing major change in the Online Public Access Catalogue (OPAC). More than half of the respondents (54 percent) were of the opinion that major changes were also taking place in the library rules.
- **Objectives of Technological Change:** The respondents were asked about the objectives of their library for shifting to new changed systems, majority of the respondents ranked "improvement and increase in services" as their top priority, followed by "Improvement and increase access to resources" and "increase in number and expectations of users". Nearly two-third of the librarians (66.7 percent) went for change when new technology became so well known that everybody acquired it. Nearly half of the libraries (49.3 percent) had always been adopting new technologies in the past to match their users' needs. More than one-third of the librarians (39.7 percent) made use of the past trends before going in for change and nearly half of the librarians (44.4 percent) gave only general consideration before adapting to consequential change. In most of the libraries in-house training is provided to the staff.
- **Adoption of New Technology in Libraries:** More than one-third of the respondents (38.1 percent) had agreed to a considerable extent that opportunities created due to globalization and privatization were a factor for adopting technology in the libraries. More than one-third of the respondents (41.3 percent) were of the view that increasing competition was also causing a threat to some extent in the change adoption policy. More than half (54 percent) respondents had agreed to a large extent that availability of new and better technology helped in the adoption of new technology. Nearly half of the respondents (49.2 percent) believed to a considerable extent that government & university policies as well as top management support were helpful in this direction. More than half (53.9 percent) librarians were of the view that the libraries should have

well laid technology adoption policy. More than half (57.1 percent) librarians had agreed to considerable extent that pursuing attitude of the employees helped them in its easy adaptation of new technology. Nearly half (47.6 percent) librarians agreed to some extent that formal education-programs should be developed to include all classes of users ranging from top management to lower level. More than one-third (42.8 percent) respondents believed that changing users' needs and expectations are also responsible to a considerable extent in new technology adoption. Apart from these, changing culture, e-resources, shrinking budget, physical space and knowledge management were also some of the factors concerning the new technologies adoption reported by the respondents.

- **Barriers in Adopting New Technology:** Majority of the respondents were of the opinion that shrinking budget, staff resistance, problems with compatibility of technology, risk of failure, lack of skilled staff and disruption in services were the barriers in managing technological change in the libraries to some extent where as lack of support from the university authority was not a barrier at all.
- **Technology Adaptation in the Libraries:** More than half (58.7 percent) librarians indicated that they had to redesign their library/ sections to some extent for adapting to technology. More than one-third (36.5 percent) librarians had agreed to some extent that for adapting to technological change they had to shift staff within the library. Nearly half (50.8 percent) respondents were of the opinion that to some extent they had to recruit suitable persons from outside to make technological change adaption effective. To some extent outsourcing of the library services had also been done by more than one-third of the librarians (41.3 percent) to adapt to technological change in the libraries. More than half (54 percent) librarians were of the view that to large extent training was imparted to the staff for bringing about changes in services. More than one-third (36.5 percent) of them changed plans, policies and rules to a considerable extent for adapting to technological change.
- **Barriers to Technology Adaptations:** More than half of the respondents 37(58.7 percent) were facing problem to some extent with the compatibility of technology in adapting to technological change. More than half (60.3 percent) librarians were of the opinion that staff resistance was also one of the barriers in the technological change adaptation process. Majority of them believed that lack of in-house technical support and lack of skilled staff were also the barriers to some extent. More than half (52.4 percent) respondents had agreed to some extent that lack of support from vendors was also one of the barriers in the technological change adaptation.
- **Managing Technological Change-Adaption:** More than one third (39.7 percent) librarians had agreed to a considerable extent that their university authority supports their library in technological change adaptation efforts through its initiative and control. More than one third (42.8 percent) librarians were of view that they had overall higher education level of staff to a considerable extent, which facilitated the technological change adaptation. More than one third (36.5) respondents were of the opinion that to some extent their professional staff helped in easy adaptation to technological change as compared to non-professional staff. More than half (54 percent)

librarians were agreed to a considerable extent that their staff was willing to accept change. Nearly half (45 percent) of them were of the view that their libraries had well laid change adaptation policies to a considerable extent.

- **Effectiveness in Technological Change Adaptation:** When the respondents were asked how the effectiveness in technological change-adaptation could be increased 'extensive training' was their top priority and 'empowerment' ranked second followed by 'Job security' and 'Rewards'.

7. Outcome of Technological Adoption and Adaptation

Libraries across the world are going through the process of adopting and adapting to technological change, so as to make them visible, viable and more productive. More than one third (39.7 percent) respondents had agreed to a considerable extent that they had been able to increase the number of library users by adopting and adapting technological change in their libraries. Nearly half of the respondents (46 percent) were of the opinion that they had been able to increase the number of services by doing this. Majority of the librarians were of the view that they had been able to reduce service time and improve the quality of service to a large extent by adopting and adapting technological change. Majority of the respondents agreed to a considerable extent that there was increase in management efficiency and improvement in collection-development as well as management. Most of the librarians were of the view that the problem of insufficient budget and staff had also been solved to some extent. More than one-third of the librarian (41.2 percent) had agreed to a large extent that there was increase in number of library users and 46 percent librarians also believed that they had been able to provide remote access to users by adopting and adapting technology in their libraries.

8. Conclusion

Based on the conclusions derived on each issue identified at the beginning of the research, it can be concluded that the current status of change adoption is fairly good in India, while the status and pace of change adaptation is not very encouraging in these university libraries. Change adoption policies are also in place in 77 percent libraries. Change adaptation policies and their updation are not considered a priority by the university libraries. Overall change adoption, and adaptation and technological change in the university libraries in India is going on at a slow pace, but at the same time, it also has a lot of scope for further improvements, for facing the complex information challenges at local and global levels. Efficient management of all these shall lead the libraries to build their change capabilities to meet the complex information requirements of users in the change-intensive information environment across the globe.

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The Role of School Libraries in the Digital Age

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Abstract: The concept of a school library in a digital age is challenging. With the capacity to download books onto a range of digital devices there is every possibility the library could look superfluous to youngsters growing up today. As the idea of teacher-librarian collaboration is changing, so, too, is the concept of a library's resources. Today's students joke about older generations using printed encyclopedias for reference projects, as many schools have added digital collections to augment their offerings. But it's not just reference materials that are going digital: Entire book collections are as well. This article suggests possible new directions towards digital library from conventional library system and computerized cooperative library networks.

Keywords: School Libraries, Digital Libraries, Smart School Libraries

1. Introduction

"With the school library literally the heart of the educational program, the students of the school have their best chance to become capable and enthusiastic readers, informed about the world around them, and alive to the limitless possibilities of tomorrow."

Mary Gaver, 1958

The old function of a library to give access to learning resources will become less important. The students and the teachers will be able to access digital resources from every place in the world as long as there is an internet connection. Yet not all students have a (good enough) internet connection at home, so for them a library will continue to be a place to get access to digital resources. Another thing that plays an even more important role in this is that the online resources are becoming so over abundant, that we could speak of a complete information flood. There are millions of websites, blogs, online instructions, and online videos. The problem for students is not to find resources on the internet, but to sift the bad sources from the good sources. This is where the library has a more important role than ever. In the paper age the sifting would be done by the library committee or the librarian by choosing which books or which magazines to buy and to display in the library. In the digital age this kind of censorship is very hard to do. Of course there is an opportunity to block non-appropriate websites. But that's not an easy job to do because the technical development of websites and browsers is very fast. The role of a librarian will be more to teach students how search properly in the ocean of information and to evaluate the value of the source of the information. (http://elearningindustry.com/, 2013).

2. The Past, Present, and Future of Digital Libraries

Digital libraries will be critical to future humanities scholarship. Not only will they provide access to a host of source materials that humanists need in order to do their work, but these libraries will also enable new forms of research that were difficult or impossible to undertake before. This chapter gives a history of digital libraries. It pays particular attention to how they have thus far failed to incorporate several key elements of

conventional libraries, and discusses current and future digital library developments that are likely to provide these missing elements. Developments of concern to humanists (such as preservation, the linking of collections to one another, and standards) are discussed in detail. (Besser).

A flood of online information has caused school libraries to reflect how they can stay relevant in today's digital world. While stereotypical libraries might be quiet places where people check out books, that's no longer an accurate description of many school libraries across the country. They're becoming collaborative spaces where students learn how to attack information problems. The mission of school libraries is to make sure students and school staff can effectively use ideas and information. That includes teaching students how to evaluate resources in different formats such as info graphics, tweets and digital images, which are often manipulated. (ROSCORLA, An explosion of online information presents an opportunity for school libraries., 2013).

3. 5 Ways School Libraries Can Stay Relevant in the Digital Age

- **Transition to the role of information guide:** In an era of digital resources, school libraries no longer function as warehouses of information, but as guides to information, Students don't understand how to evaluate, sift through and use information from the Internet, and their parents don't either. That's why they need information experts to lead them, particularly since they'll be doing more of it given the Common Core State Standard's emphasis on research.

  We definitely still need school libraries now more than ever because of there being so many more places to find information, and not only are there more places to find the information, those sources have no editorial or vetting that goes on.

- **Keep up with the times:** As more resources move from print to digital, school libraries need to reflect that shift. Libraries won't look relevant if they don't have digital resources, mobile devices and social media accounts.

  Many libraries now have two front doors: A virtual door to the cloud and a physical door to a collaborative spaced. By keeping library doors open, schools provide equitable access to the digital research tools that students need to succeed, particularly in high school and college. These resources include e-books, databases, websites, subject directories and wikis. For about half the kids in our country, they do not have the access to the tools they need to explore the kind of investigation that kids should to be doing at any level. And part of the reason for that is because people don't get what they're eliminating when they eliminate libraries and librarians.

  Librarians stressed the importance of keeping some physical books on hand because many students prefer them. But those books should be up to date, relevant and well-used to stay in school library collections.

- **Transfer resources to the cloud:** By weeding out print collections and moving many of them to the cloud, libraries will free up room for learning spaces and provide access to digital resources 24/7. Through a library service called Libguides,

librarians in the New Jersey district answer student questions online and put together guides for different areas including library orientation, language arts and chemistry.

- **Collaborate with teachers:** It's also important for librarians to plan lessons with teachers. By planning lessons together, teachers and librarians can combine content knowledge with 21st century soft skills including critical thinking, communication, collaboration and creativity.
- **Transform library spaces:** Through the library's physical door, school districts are reimagining what libraries look like. In Douglas County School District, 16 out of 80 school libraries have created learning commons that include maker spaces, brainstorming areas and cafe-style places. Learning spaces were designed to meet the needs of particular students and schools. Key components of these spaces include flexible furniture, flexible devices and flexible schedules. (ROSCORLA, http://www.centerdigitaled.com/, 2013).

4. Beyond the Print vs. Digital Debate

The common question about going "print or digital" with library content honestly glosses over multiple variables that significantly impact the resource availability to library patrons. There is often an assumption that digital content is less expensive than print, but that is a false assumption. Digital content can be substantially more expensive depending on content availability, methods of access, accessibility to mobile users, and the prevalence, availability, types, and cost of mobile devices. Decisions about content must take into account issues of access that are directly affected by campus infrastructure and technology standards, budget, and student use and demand patterns. A final factor is content availability: as of spring 2013, some publishers are resisting library ownership of ebooks, which means that committing to an all-digital collection could deny students access to some cutting-edge thinking. Nicholas Carr writes in a Wall Street Journal article, "Don't Burn Your Books — Print Is Here to Stay," that ebooks as we know them today may be just another format, like audiobooks.7 In other words, an all-digital collection can be just as limiting as an all-print collection.

It makes sense for schools to increase their digital collection and virtual presence, but we don't believe that schools benefit by dramatically downsizing the library's space. School libraries will continue to need teaching spaces that support the increasing Makerspace activities. Librarians remain the best trained to teach information and research skills. The library is, at its core, a classroom that promotes independent learning, but even the most independent learner's benefit from expert guidance as they seek new resources. The actual space needed will remain substantial. Depending on the age of the students and the school's existing print collection, the arrangement of the space may change substantially to allow more class teaching areas with Wi-Fi and useful digital applications. Or it may stay about the same to house existing collections of perhaps picture books for the very young, academic books that may never be digitized but that support specific courses on a campus, and/or continuing strong print collections because the community prefers some materials in that format.

Independent schools are known for their independence of thought. Each school — through its mission and vision — will analyze the changing terrain of the ebook and digital content conversation as it affects both budget and space decisions. Few schools can ignore e-content totally; just as few will want to eliminate all print content from their libraries. Change requires us to examine the spectrum and see where we fit within it. It requires an ongoing conversation and awareness of what other schools are doing, what devices and new formats are on the horizon, and how those facts can best be aligned for our specific situation.

5. The Librarian's Role in a Multiform at School Library

When a student discovers the perfect resource to answer a question or need — whether it is a database article, a book published in the 1880s, or a website — there is usually a librarian who facilitated that discovery, marking the path from the student search term to the discovered source. They help students to ask good questions of all resources, and to apply the answers to their continued research efforts. But finding quality authoritative information online is not the whole of the library-technology related curriculum. Many school librarians also teach digital ethics, copyright laws, and creative problem solving. They help facilitate the increasingly important global connection between students and the rest of the world, helping students connect to an authentic audience in a broader community, arranging Skype sessions with authors or experts in other locations, and culling resources as needed from varied sources and experts cyber-wisdom through library blogs, Facebook pages, and Twitter accounts and recommending new tools for specific curricular projects.

As the digital world becomes ever more pervasive on our campuses, librarians offer the human connection among campus departments. Because the library centralizes so many digital access points and ensures that teachers get the best support possible, librarians are in constant collaboration with the information technology staff and educational technology specialists. (Abarbanel, Davis, Hand, & Wittmer, 2013).

6. Conclusion

The era of digitization began over 15 years ago. In the age of digitization, networking, automation and modernization of libraries; school librarians have to deals with three main problems i.e. varying levels of needs; lack of integration of all library technical processing in automated systems; existing computer network architecture bottlenecks and costs. The future of libraries are transforming into the internet age.

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Transformation of Library Services in Digital Environment

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Abstract: In the present era, Information Communication & Technology (ICT) is playing a very crucial and vital role. With the penetration of ICT in every sphere of life, the impact of electronic services can be seen in every field viz., education, industries, health, entertainment, governance, etc. and library and information services are not the exception. These electronic technologies also show their presence in libraries. The present user is skilled in using the electronic information sources and wants to explore all the benefits of digital technology. Librarians are now applying the ICTs to meet the users' requirements. The present paper highlights the use of ICTs in processing and producing the library services and explains the paradigm shift from traditional print based library services to modern digital web based library services. The present paper describes the major transition of library services in digital environment. Paper gives a brief view of how the use of electronic books, journals and databases and web based library services has changed the whole scenario.

Keywords: Library Services, Digital Library, Transformation of Library Services

1. Introduction

A library is concerned with the task to cater to the informational requirements of its users and to satisfy them up to their expectation level and accordingly the librarians are forced to implement the ICT while providing and processing the services. With the application of ICT, libraries are changing in terms of functions, resources or services. The journey started with the replacement of card catalogue service to online catalogue. The concept of e-services changed traditional manual services into electronic services.

There is a paradigm shift in each and every field of libraries, therefore library professionals (librarians) should also change or acquire skills in order to cope up with the changing situation. In this swift changing environment there is rapid and continual growth in terms of information resources as well as users and therefore it is very important to manage the resources and made them available to the right user at right time so that libraries can work effectively and efficiently in the changing environment. In order to provide services to the users speedily in the changing digital environment, it is important to provide services in e-format to the users. Information explosion, need of knowledge societies, concept of e- libraries, resource sharing, networking, online products, online products, faster delivery, of services, etc. demand for fast and effective e-services.

2. Need of e-services

Library collections have changed drastically due to advent of technology. Users also demand information in e-format so that they can access information effortlessly from their desktop. This trend has now forced libraries to provide the computerized library services and to acquire information sources in various forms & format and provide the same through various e-services like online services; alert services, electronic clipping services (ECS), and subscription based full text services etc. for the maximum utilization of sources in digital era. Therefore, the need of e-services is felt for a variety of reasons:

- Round the clock from any corner of the world.
- Excellent searching facilities in electronic resources.
- To maximize the usage of information sources
- Multiuser access
- To provide information promptly at a low cost.
- Convenience to users to access information without going to library.
- Users' satisfaction with quality service
- Easy Resource sharing globally
- Multimedia environment

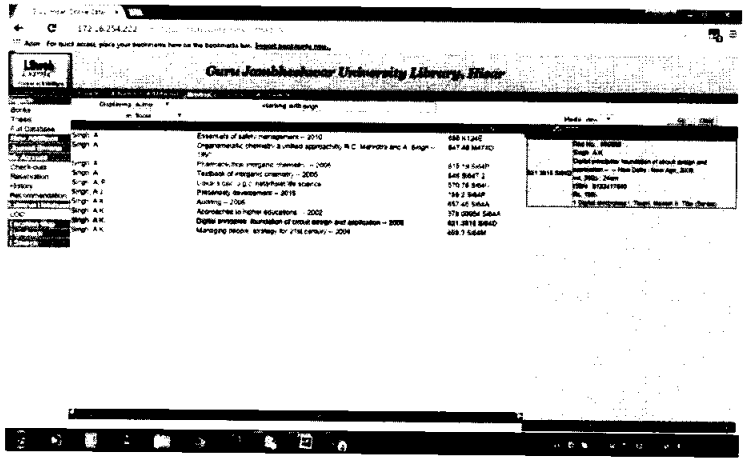
3. Transition of library services

Library professionals have come a long way from being just a mere custodian of books to information generators ad providers. The emerging electronic information environment has transformed traditional set up of library services to electronic services. There are varieties of services which are now being transformed for easy, quick, convenient and wider access. Few of them are discussed below:

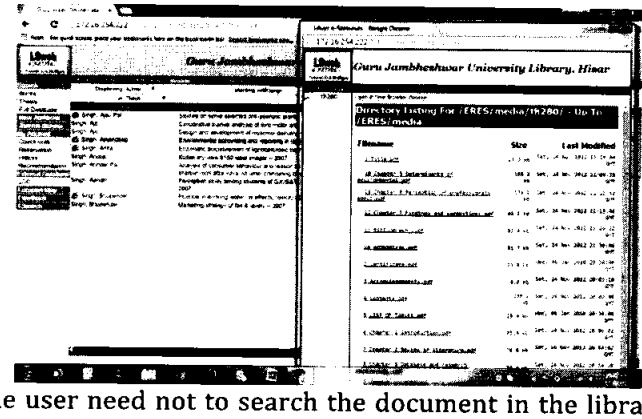
- **Card Catalogue to OPAC and OPAC to WebPAC:** The catalogue of a library is a list of holdings of a particular library and gives information to user where a particular searched material is placed in the library. The library Card Catalogue has almost already converted in OPAC (Online Public Access Catalogue) which is the gateway to library's collection. Harvey (1999) describes an OPAC as "Knowledge Access System whereby the catalogue is both a finding and access tool". There is no need of added entries and insertion of cards as in printed catalogues as the OPAC works in integrated environment. Because of digital data, it is easy to create union catalogue where several libraries share the same database. By searching OPAC, the users can have the following:

    - Availability of a particular document in the library and number of its copies.
    - Status of material- on shelf, issued to any user, in bindery, missing or withdrawn form library collection.

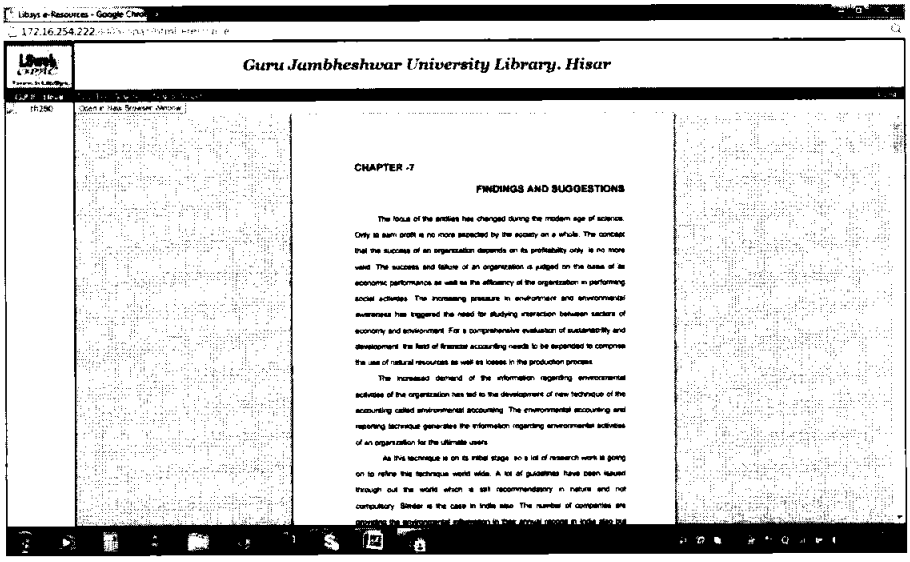
- Account history of particular book- how many times a book is issued among various members of the library.
- Account history of a member- how many books a member borrow from the library.
- In case a book is overdue to any member, what is the amount of fine he/she has to pay?
- The OPAC can be accessed over internet by using its URL and are called WebPAC. A Web OPAC is a library catalogue on the Web or Intranet and can be used in locating items in other libraries. If the required item is available in remote library, a request may be made to get the same.



Many libraries attached multimedia files with the entry of any title in the OPAC. If the user finds a particular document in electronic format also, he/she may download and read the same on the same system.



In this way the user need not to search the document in the library with or without the help of library staff. The main beauty of OPAC or WebPAC is its excellent searching techniques as users can apply 'and', 'or' 'not' Boolean operators for searching any document.



- **Classification and Subject Headings:** Libraries follow a particular scheme for classifying its collection. The most commonly classification schemes are- Dewey Decimal Classification, Colon Classification, Library of Congress Classification, Universal Decimal Classification. In a traditional library, library professionals/ experts classify the documents as per the scheme of the classification. Now with the emergence of the online classification schemes library professionals are making use of various websites such as Library of Congress, British Library etc. for obtaining the subject headings and classification number of any document. The WebPAC of other libraries can also be used for this purpose. This process not only brings uniformity in classification and indexing and users may find the documents of their interest, in any library, at the same classification number. A bibliography may be generated from the classification number instantly for further use.

- **Automation of Borrowing and Lending of Library Materials:** Library lends its materials to its patrons as per their entitlements. For lending the materials, librarians are applying latest and modern information & communication technologies. No library can provide every document to every member out of its stock. The available stock of a library is shared by its patrons by borrowing books for a particular time and then to return in the library for others. With the passage of time and emergence of new techniques, the circulation system of library transforms accordingly. Libraries implemented the modern techniques to save the time of its patrons and to share its resources at national and international levels.

  In readers' tickets circulation system, the library issues readers' tickets to its members as per the loan privileges to various categories of library members. Library readers' tickets has the information with regard to name, class, department, validity of tickets, roll numbers etc. of library members. Likewise, every book has one book card inserted in a book pocket. Book card has the information with regard to author, title, accession

number and classification number. At the time of any library transaction, this book card is taken out of its pocket and inserted in the readers' ticket and whenever this book is returned in the library, the book card is again inserted in its pocket and the book is re-shelved at its place for future use by any other member

The use of Radio Frequency Identification (RFID) technologies has further sharpened the quality of library services. This technology uses radio waves to identify an object automatically. In a RFID system the antenna enables the chip to transmit the identification information to a reader. The reader converts the radio waves reflected back from the RFID tag into digital information that can then be passed on to computers and make use of it. The RFID system is very helpful in libraries as many books on a single click can be issued or reissued. Likewise at the time of check-in, many books can be returned instantly. The users can also check-out and check-in the material from the library. The library may install sorting systems with the Book Drop Units. These sorting systems place the returned books in specified bins according to Class Number automatically which not only facilitate the staff in re-shelving of returned books but also save the time of the library staff. It is very easy to search a misplaced book in the library by using RFID Tags.

- **Multimedia Labs in Library:** The academic libraries provide reading facilities with comfortable furniture, proper ventilation, heating and cooling devices, lighting etc. Now with the availability of advanced ICTs and digital information sources, libraries are providing multimedia labs within library and over campus wide networks. Some users want to read the material by using their laptops, e-book readers, tablets which require power supply to charge the batteries. Separate reading halls for such readers are being provided along with power backups. Now the users visit library not only for reading or borrowing the library materials but also to complete their projects and assignments by using the multimedia labs with equipped with the latest technology and working environment. The trained library staff not only provide the assistance in locating the reading material but they also help in using the technology and different types of databases subscribed/ provided in the library.
- **Alert to e-alert and RSS Feed Services:** In an alerting service email messages are sent to subscribing researchers at specified intervals -daily, weekly, or monthly, etc. As per publishers' policies of alerting service, these messages might include bibliographic citations for articles on certain topics or notices of new research by authors of interest. E-alerting services and Selective Dissemination of Information are the examples of Current Awareness Service.

  Now, with the emergence of electronic journals the content of journals are delivered to the public much earlier than print version by e-mail with links to citation or abstract or even to full text. In order to get right information at right time, e-alert services plays an effective role and this service is proved as a boon to the researchers, because most of the journal publishers are, now, giving this service free of cost. E-Alert is a service designed to keep the patron abreast of the latest information through early notification of forthcoming articles by email. The users are supposed to make a formal registration with the publishers' site.

The websites may not have a specific schedule to be updated such as blogs, news sites, product information pages, organizations information pages etc. For any researcher, it is not only tedious and cumbersome but almost impossible to check each and every website in order to get updated information. In a current awareness service environment, getting information through e-mail regarding any change notification is not the right answer. The received e-mails from many websites can get uncontrollable. The RSS is a better way to notify latest and changed contents. RSS is also called Rich Site Summary and become the major source of obtaining latest information. It is a way to easily distribute a list of headlines, update notices, and sometimes content to a wide number of people. It is used by computer programs that organize those headlines and notices for easy reading. http://rss.softwaregarden.com/aboutrss.html

4. Conclusion

In the present emerging era of ICTs, the library professionals have to restructure the library services in order to meet the digital information requirement of patrons. The emergence of digital technology has opened the fast and effective ways of procuring, handling and proliferate information. They must learn to access, analyze, evaluate, procure and disseminate information among its patrons, even out of the library as per their convenience. They have to provide pinpointed but exhaustive information, may be printed or digital, to the right user at the right time and right place.

Library professionals are providing web based information services but a lot of work has to be done in applying latest ICTs in library. The emerging technologies have empowered the libraries to produce services and resources in e-format to enhance information accessibility, convenience, quality and expediency to users. Digital technology has provided new ways of accessing and handling information. The research outputs and many surveys have proved that utilization of information resources has increased very swiftly and resource sharing has become very effective and easy with the help of these ICTs. The researchers want the required information on their desktop while in office, library or in teaching department and on their mobile phones, ipad, tablet etc. while in park, journey etc. Library professionals should have to prepare themselves to meet out the increasing expectations of users in the coming years.

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Use of Mobile Technology by Social Sciences PG Students of Kurukshetra University, Kurukshetra, Haryana: *A survey*

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Abstract: The main purpose of this survey is to investigate the use of mobile technology by the post graduate (PG) students of social sciences of Kurukshetra University, Kurukshetra. The survey found that students are using mobile technology mainly for communication purpose. WhatsApp and Facebook are the most used social media applications. Mobile devices are mainly used for E-mails, instant messaging, newspaper reading and online shopping. However, least number of students used University library website. Slow network connection and cost of data service are major reasons which prevent the use of mobile technology; while overall attitude towards mobile technology was found positive.

Keywords: Mobile Devices; Information Searching; Social Media; PG Students; Mobile Technology.

1. Introduction

Mobile devices and applications provide access to information in the comfort of people's homes and offices, using their cellular phones or a personal digital assistant which enables access to information without the limitations of space and time (Aharony, 2013).Mobile devices help a literate person to become information literate. Therefore, mobile devices are not being used for calling purpose only but for getting information in hand efficiently and effectively. The abundant nature of mobile devices, combined with latest upgraded operating system (OS) platform, WiFi and 3rd Generation (3G)and above it the4th Generation Long Term Evolution (4G LTE) network technology, excellent speed of processor along with the standard applications for accessing internet quickly, make sure the every bit of information in hand. There are number of applications available that let the users access a dictionary to accessing the web and getting an experience of desired information in mobile environment, so why students go anywhere. Laptops and PCs have become the past and today the PDAs, tablets, fablets and mobile devices are prevalent as the nature and curiosity of the users to seek information has changed. The present paper makes an attempt to know the use of mobile technology by the post graduate (PG) students of social science of Kurukshetra University, Kurukshetra.

2. Objectives of the study

- To explore the main purposes of using mobile technology.
- To find out information activities done by using mobile technology.
- To find out most used social media apps and educational based features through the use of mobile technology.
- To examine the attitude of students towards mobile technology
- To explore the problems/reasons which prevent the use of mobile technology

3. Methodology

The study was conducted on 141post graduate students of social sciences of Kurukshetra University, Kurukshetra. Survey method was used to collect the data. In total 184 questionnaires were distributed, out of which 141 filled in questionnaires were received back with 76.63 percent response rate. The survey was conducting during November 2015. Statistical Package for Social Science (SPSS) was used for data analysis and then data was imported to Microsoft©Excel 2013 to ensure the validity and accuracy and to present the data through tables and graphs. The measure of internal consistency, Cronbach's alpha was used to check the consistency and reliability of the questionnaire by using SPSS© version 20.0 and the alpha coefficient found was 0.739, which suggested that the items in questionnaire have relatively high internal consistency. Earlier studies in the existing literature confirm that reliability coefficient of .70 or higher are considered "acceptable" in most of the social science research situations.

4. Data analysis and discussion

- **Age and Gender wise distribution**

Table 1 shows the gender and age wise distributions of PG students under study, out of 141 students, 66 (46.80 percent) were male and 75 (53.20 percent) were female. Majority of the students i.e. 74 (52.48 percent) were below 22 years of age and 66 (46.80 percent) were between the age of 22-25 years.

Table 1: Age and Gender wise distribution

Age Group	Gender	Total	
	Male	Female	
Below 22	33	41	74
22-25	32	34	66
26-29	1	0	1
Total	66	75	141

- **Duration of time having mobile devices**

Since how long the student's are having mobile device, highlights the acquaintance with mobile technology. Table 2 shows that a major part of the students i.e. 80 (56.74 percent) have mobile devices since last more than 4 years while 27.66 percent students have since last 3 to 4 years and 13.48 percent since last 1-2 years. Only 2.13 percent (in total) students are such who started using mobile device less than a year ago.

Table 2: Duration of Time having Mobile Device

Time	Respondents (N)	Percentage
Less than 1 Year	3	2.13
1 - 2 Years	19	13.48
3 - 4 Years	39	27.66
More than 4 Years	80	56.74
Total	141	100.00

Table 3: Operating System Used

Operating Systems	Respondents (N)	Percentage
Android	115	81.56
Apple iOS	9	6.38
Windows	7	4.96
Symbian	5	3.55
Nokia Asha	3	2.13
Black Berry	1	0.71
Nokia X	1	0.71
Total	141	100

- **Operating system use**

Android is widely used operating system (OS) in mobile devices around the world and this fact is clearly proved by the present study as shown in Table 3 that majority of the students (81.59 percent)are using Android OS. Apple iOS with 6.38 percent and Windows with 4.96 percent users got 2nd and 3rd order. Other operating system used by the students are Symbian (3.55 percent), Nokia Asha (2.13 percent), Black Berry and Nokia X with 0.71 percent each.

Table 4: Network Connection Used

Network	Respondents (N)	Percentage
GSM	77	54.61
CDMA	4	2.84
WCDMA (3G)	24	17.02
Wi-Fi	36	25.53
Total	141	100

- **Network connection used**

Global system for mobile communication (GSM) is very popular and widely used digital mobile system around the world for information access and communication rather than the other systems like wideband code division multiple access (WCDMA) and Wi-Fi. Table 4 shows that GSM is the most used network connection by 54.61 percent students for information access, Wi-Fi by 25.53 percent and WCDMA or 3G by 17.02 percent. CDMA network was used by only 2.84 percent student for the said purpose.

Table 5: Time spent on Mobile Device for Information Searching

Time	Respondents (N)	Percentage
< one hour	31	21.99
1 -2 hours	52	36.88
3 - 4 hours	33	23.40
5 - 6 hours	15	10.64
> 6 hours	10	7.09
Total	141	100

- **Time spend for information searching**

More time spent on mobile device means more information to be accessed or searched. The results in present study show that 36.88 percent students spend 1-2 hours daily on mobile for information searching, 23.40 percent students spend 3-4 hours, 21.99 percent spend less than an hour, 10.64 percent students spend 5-6 hours a day and remaining 7.09 percent students spend more than 6 hours a day in using mobile for information searching through mobile (Table 5).

- **Use of mobile devices in availability of PCs/Laptops**

Students were asked whether they were using the mobile devices when PCs or laptops are available; table 6shows that45.39 percent students are using mobile device 'often', 22.70students'very often', 14.18 percent and 7.09 percent are using 'seldom' and 'very seldom' respectively even when PC and laptop is available. While 10.64 percent students are such who never using the mobile device when PC or a laptop is available.

Table 6: Use of Mobile Devices in Availability of PCs/Laptops

Frequency	Respondents (N)	Percentage
Very often	32	22.70
often	64	45.39
seldom	20	14.18
very seldom	10	7.09
never	15	10.64
Total	141	100

Table 7: Information Searching through Mobile Devices (Multiple answers permitted)

Information	Respondents (N)	Percentage
Read newspaper	108	76.60
Online Shopping	95	67.38
Take Pictures/Video	81	57.45
Download E-books/Research articles/Reports	80	56.74
Use online maps or GPS	70	49.65
Check Weather	57	40.43
Health/Wellness/Beauty Information	56	39.72
Buying Tickets	39	27.66
Stock Price/Market Information	39	27.66
Pay Bills	34	24.11
Research/Book travel	40	28.37
Organization Tools	24	17.02

- **Information searching through mobile devices**

Mobile device have versatile functionality as one can search or brows lot of information by using them. Table 7 in this context shows that PG students are searching various types of information through mobile as read newspaper (76.60 percent), online shopping (67.38 percent), take picture and videos (57.45 percent), download E-books/research

articles/reports (56.74 percent), use online maps and GPS (49.65 percent), check weather (40.43 percent) and health/wellness/beauty information (39.72 percent), pay bills (24.11 percent) and organization tools (17.02 percent).

- **Information activities done through mobile devices**

Table 8shows that PG students are using their mobile devices for number of information activities such as instant messaging (81.56 percent), listening audio and music (78.01 percent), social networking (73.76 percent), E-mails (72.34 percent), text messaging (70.92 percent), dictionaries and online encyclopaedias (63.83 percent), web-based music and videos /video websites (58.16 percent), playing games and puzzles (53.19 percent) and office application such as word, excel & pdf (33.33 percent).Some other important and latest information activities such as wikis and blogs, voice over internet protocol and online virtual world are being used by least number of students i.e. 17.02, 13.48 and 4.96 percent respectively. However, the University library website is being used by the minimal portion (20.57 percent) of the students.

Table 8: Information Activities done through Mobile Device (Multiple answers permitted)

Information Activities	Respondents (N)	Percentage
Social networking Apps or websites	104	73.76
E-Mail	102	72.34
Listen Audio or Music	110	78.01
Text messaging	100	70.92
Instant Messaging (IM)	115	81.56
Dictionaries, online encyclopaedias	90	63.83
Watch Videos, Video websites (YouTube, etc.)	82	58.16
Download Web-based Music or Videos	82	58.16
Playing games/puzzles	75	53.19
Video calling, Webcasts/Podcasts	45	31.91
Office Applications (Word, Excel, PDF, etc.)	47	33.33
Simulation or educational Games/Apps	39	27.66
Use University Library website	29	20.57
Wikis, Blogs, etc.	24	17.02
Voice over Internet Protocol (VoIP) Skype, etc.	19	13.48
Online Virtual World (Second Life, Fonterra, etc.)	7	4.96

- **Social media application used on mobile**

Table 9 shows the use of social media applications on mobile devices. WhatsApp and Facebook are being used by 85.82and 82.27 percent students respectively. Other social media applications being used are Google+ (56.74 percent), WeChat (29.08 percent), Skype (26.24 percent), LINE (24.82 percent) and Twitter (17.02 percent). Least number of students uses Instagram (15.60 percent), Hangouts (14.89 percent), LinkedIn (13.48 percent), Picasa (11.35 percent), MySpace (4.96 percent) and One Drive (1.42 percent).

Table 9: Social Apps Used on Mobile Device (Multiple answers permitted)

Social Apps	Respondents (N)	Percentage
WhatsApp	121	85.82
Facebook	116	82.27
Google+	80	56.74
WeChat	41	29.08
Skype	37	26.24
LINE	35	24.82
Twitter	24	17.02
Instagram	22	15.60
Hangouts	21	14.89
LinkedIn	19	13.48
Picasa	16	11.35
MySpace	7	4.96
One Drive	2	1.42

Table 10: Use of Educational Features on Mobile Devices (Multiple answers permitted)

Educational Features	Respondents (N)	Percentage
PDF Files	119	84.40
PowerPoint	59	41.84
Office Word	62	43.97
Educational Apps	60	42.55
Excel Spreadsheet	36	25.53
Reminder	28	19.86
HTML Files	35	24.82
Work planner or To-Do List	19	13.48

- **Educational features used on mobile**

PG students are also using myriad education features on mobile devices. Table 10 shows that PDF file were are being used by 84.40 percent students. Office Word, educational apps, PowerPoint and Excel Spreadsheet are the educational features which are frequently being used by 43.97, 42.55, 41.84 and 25.53 percent students respectively. Other educational features used by the least number of students are HTML files (24.82 percent), reminder (19.86 percent) and work planner or To-Do list were (13.48 percent).

Table 11: Main Purpose of Using Mobile Device

Purpose	Respondents (N)	Percentage
Communication	91	64.54
Informational	22	15.60
Educational	19	13.48
Entertainment	9	6.38
Total	141	100

- **Main purpose of using mobile devices**

In the present study, the main purpose of using mobile devices was divided into four categories i.e. communication, informational, educational and entertainment. Table 11 shows that 64.57 percent of the total students are using mobile devices for communication purposes, 15.60 percent are using for informational purposes and 13.48 percent are using for educational purposes. Remaining least number of students i.e. 6.38 percent are using mobile devices only for entertainment purposes.

Figure 1: Skill Level for Different tasks by using Mobile Device

- **Skill level of mobile use**

The skill level of the students for different tasks by using mobile devices was measured on 5 point Likert's scale and mean values were calculated as shown in figure 1. The skill level was found the highest regarding "using the internet effectively and efficiently to search information" (M=3.49) and "using office software creating of editing documents" (M=3.06). Skill level of evaluating the reliability and credibility of online sources of information was found good with mean value of 2.93. However, the skill level of students was found satisfactory in the context of understanding the ethical issues surrounding the access and use of digital sources (M=2.6) and using university library website to access the electronic resources provided to the students with mean value 2.48.

- **Reasons/problems which prevent the use of mobile devices**

Table 12 presents the reasons/problems which prevent the students from using mobile devices for information searching and it was found that slow network connection was the main problem faced by 61.70 percent students. Other reasons which prevents the use of mobile devices are cost of data services (53.19 percent), inadequate battery life (36.17 percent), limited access to network and cost of mobile devices (30.50 percent each), Security/privacy issues (28.37 percent) and health related issues (24.82 percent). Other problems which are being faced by the least number of students are device usability issues (16.31 percent), lack of useful applications (15.60 percent) and penalty of other ways to access the internet (12.77 percent).Cost of useful application was the minor problem faced by only 11.35 percent students.

Table 12: Reasons/problems which prevent the Use of Mobile Device for Information Searching (Multiple answers permitted)

Reasons	Respondents (N)	Percentage
Network connection too slow	87	61.70
Cost of data service	75	53.19
Inadequate Battery life	51	36.17
Limited access to Network	43	30.50
Cost of Mobile Device	43	30.50
Concern about security/privacy problem of mobile technology	40	28.37
Concern about potential health problem of mobile technology	35	24.82

Plenty of other ways to access the internet	18	12.77
Device usability issues (Small Screen, Key Board, etc.)	23	16.31
Lack of application that are useful to me	22	15.60
Cost of application that are useful to me	16	11.35

Figure 2: Attitude towards statement regarding Mobile Technology

- **Attitude towards mobile technology**

Students' attitude towards some statements regarding use of mobile technology was recorded at 5-point scale i.e. Strongly Agree; Agree; Neutral; Disagree and Strongly Disagree as shown in the figure 2 where higher value of mean indicates positive attitude. The attitude was found positive towards the statements such as'the use of mobile device in course improves my learning' with mean value 4.3, 'mobile devices makes my course more convenient' with mean value 4.06, 'in the next three years I expect to do many things on mobile which I am currently doing on laptop/PC' with mean value 4.04, and 'I get more actively involved in course that use mobile devices' with mean value 3.84. Slightly negative attitude was found towards the statement such as 'professors should have the authority to forbid the use of mobile devices for any type of activity in class' with mean value 3.17 and 'I regularly use mobile devices in the classroom for course activity' with mean value 2.96. So the overall attitude of the PG students towards mobile technology was found positive.

5. Conclusion and suggestions

The PG students of social sciences of Kurukshetra University have a great passion of using mobile devices mainly for communicational purposes whether it is in the form of instant messaging or use social media applications. There is a need to improve their skill which will enhance the use of mobile devices for educational purposes and getting adequate information by using their ultimate features. It has been found that PG students are slightly unaware regarding advantages of using mobile technology. In this context, it is suggested that, university can provide an exciting opportunity to student by organising information literacy programs, which will help the students in using their mobile devices as an educational and informational tool or media.

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Use of 'Whatsapp' Messenger in Library Services

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Abstract: This paper describes the use of 'WhatsApp' messenger in library services. It is a Smartphone mobile application through which images, messages, videos and audio clips can be exchanged in the libraries. To make different discipline user groups on whatsapp better library services can be provided. This paper focuses on various library services provided through this application. Features and challenges of this application also explained in this study.

Keywords: Whatsapp, Smartphone, Library Services

1. Introduction

WhatsApp messenger is a cross-platform mobile messaging application which allows exchanging messages without having to pay for SMS. It had become the largest messaging platform all around the world. It was founded in 2009 by Jan Koum and Brain Acton, who was the former employees at Yahoo Inc. It was initially started for Android mobile devices and soon come over to Windows, Symbian, iOS, Blackberry OS. It uses the same internet data plan that is used for email and web browsing, there is no cost to message and stay in touch with any person. In addition to basic messaging whatsapp users can create groups, send each other unlimited images, video and audio media messages. It is processing more than 30 billion messages everyday and this made facebook, the largest social networking website to purchase this application.

In the information and communication technology era, every user wants to access the information very speedily. They want to access maximum information in minimum time. By the use of 'whatsapp' technology in library services, information can be delivered quickly to users.

2. **Advantages /Features:** Some of the great advantages of using whatsapp in the libraries are:

- **Free Service:** This service is completely free. Messages can send easily without any charges. Libraries need not to spend extra money to use this application.
- **User Friendly:** All tools provided by whatsapp are very easy to use. An internet savvy can handle it very easily. It is a direct and user-friendly service for library users to use whatsapp to contact librarians, so as to locate general library information and seek assistance when using the library.
- **No Advertisement:** Most of the applications/sites display popup bar or different kind of advertisements on the screen which appears many times during the use of application. But whatsapp do not have any advertisements on display screen.

- **Know about whatsapp users:** This application automatically imports the contacts from phone and tells how many of users are using whatsapp. It helps the librarian to make the user groups.
- **Infrastructure required:** To contact the librarians by whatsapp the only requirements are a supported phone, internet connection and storage space on the phone to download this application.
- **Eco-friendly:** By using this application no photocopy of documents and their correspondence is required in library which makes eco-friendly environment and support to green management.
- **Cost effective:** To deliver the information to users through whatsapp no person and postage charges are involved. Only mobile and internet plan charges are incurred. Though most of the libraries have already availed the internet or Wi-Fi facilities in their premises.
- **Time Saving:** The most important features of use of whatsapp in library services are it save the time to deliver the information and desired information can be delivered speedily at any location. It also fulfills the Ranganathan's fourth law of library science i.e. "save the time of the user".
- **Usages of library:** By using this application users can know about the desired document is available or not in the library and they visit the library to get the same that will promote the use of library.

3. Possible Areas for Usages of Whatsapp In Libraries

Most of the library services can be provided through whatsapp. The possible areas in which whatsapp can be used are discussed below:

- **Newspaper Clipping Service:** Newspaper clippings service is one of the premium services provided by the library to its users. Newspaper clips related to the institution can be sent through whatsapp. Other important news not related to the institution can also be send to users for updating their knowledge.
- **Reference Service:** Reference service can be provided through the use of this application. Web address of related queries and desired information pictures can be sent to users. Instructions regarding how to use e-resources in the library can be sent by its chat service.
- **New Arrivals:** Pictures and contents of current titles or issues added in the library can be sent to users. This service will keep the users up to date with published literature. It fulfill the Current Awareness Service provided by the libraries.
- **Selective Dissemination Service:** Department wise user groups can be created. Pictures of table of contents, chapter or articles or all other required information can be sent through whatsapp to the related groups. It fulfill the Document Delivery Service of the libraries.

- **Procurement of Books & Periodicals:** By using this application users can give the demand of books and periodicals which is to be purchased in the library. For this purpose users do not need to visit the library in person.
- **Purchase Order:** Librarian can place a purchase order of books and periodicals through whatsapp to the desired vendors.
- **Library Rules, Notice etc:** A picture of all the library rules and regulation can be uploaded through this application. Books and periodicals requirements notice even institutional notices can also be circulated to users.
- **Ask Librarian:** Any users can live chat with the librarian regarding their queries. Librarian can give online possible solution to them. Users can ask whether the document is available or not in the library.
- **Reminder:** If a book is overdue than its reminder can be sent to the related users by its chat service.
- **Audio/ Video Message:** The demo of how to use library resources and services can be uploaded on whatsapp. It will orient the users about the library services and resources.
- **Bill or Receipts:** Library can receive the bills/ receipts of books or periodicals by the related vendors through this application.
- **Resource Sharing:** Whatsapp is the better approach to share the resources among libraries. Libraries can share the information which is not available in their respective libraries from other libraries.
- **Reading Habit:** The photograph of best library users can be uploaded on whatsapp and circulated to all users. It will create reading habit among users and motivate them to maximum use of library.
- **Locate the resources:** Pictures of all sections of library can be uploaded on whatsapp so that users came to know that such types of facilities are available in the library.
- **Fine List:** A picture of library fine list can also be uploaded on whatsapp and circulated to the related users.
- **Research Consultation and Instruction:** It is a kind of customer care service. Research scholars may have an interaction with the library staff to get the consultation and get suggestions by the use of whatsapp.
- **Physically Disabled Person:** It is helpful application for those users who cannot visit the library personally and provides a constant link to required information resources. It is especially helpful for disabled persons.

4. Challenges

Like every technology whatsapp too has advantages and disadvantages. So here are some of the challenges of this brilliant app:

- **Skill to operate the smart phone:** Knowledge of how to use the smart phone functions is must. For this, library professionals must have better knowledge to operate the smart phone.
- **Possession to have Smart Phone:** Some people do not like to have smart phone (expensive investment for some) as they feel easy to have normal phone.
- **Not cover all Users:** It connects only with other people having a Smartphone with whatsapp installed. In any institution, it is not possible to compel users to have smart phone.
- **High camera resolution:** Smart phone have different quality with their camera resolution. Picture quality depends on camera resolution. For finest quality of pictures, a high resolution camera phone is required which cost is comparatively high.
- **Internet connectivity:** Uninterrupted internet connectivity is required to better use of this application. But it is depend on service provider. Many users faced a lot of connectivity problems.
- **Not comfortable reading:** Reading on mobile phone is not comfortable with compare to paper. Long data reading is not comfortable on mobile.
- **Battery Charging:** When mobile data is on then it consumes the mobile battery very speedily and battery need to charge after a short time.
- **Hanging Problem:** Most of the smart phones creates a problem of hanging. It can affect on quick library services.
- **Contact Add:** For use of this application in libraries a lot of mobile numbers will be feed in mobile contacts that will consume more time and use space in the device.

5. Conclusion

After analyze the benefits and limitations of whatsapp application it is concluded that this application can be used in library to provide better and quick services which is the need of the hour. This will reduce the paper work in the library and create a sustainable environment and support the green management. It is a best technology for the library especially to provide news clipping and reference service. At present this application is less using in libraries but it will be widely used in future.

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Author Profile



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WhatsApp? – A Platform to Promote Library Products and Services: *A Successful Experiment at SCSVMV University*

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Abstract: The library user's irrespective and type of library now days having strong passion towards the use of mobile phones particularly smart phones with lots of smart applications. The library and information science professionals can use the mobile platforms to increase the access to library products and services in terms it build strong relationship between library users and LIS professionals. Finally it improves the image of the library and professional will recognized. In this paper, the researcher describes about the "Implementation of WhatsApp in library services at SCSVMV University". Further the highlights the WhatsApp messenger, service provided through WhatsApp, library professionals in WhatsApp groups, WhatsApp services in SCSVMV university, Display screen of users added, display screen of information delivered, Do's and Dont's of WhatsApp services and Group Admins/librarian. The above services are successfully implemented in SCSVMV university library.

Keywords: WhatsApp, LIS Services, SCSVMV University, WhatsApp Messenger, WhatsApp best practices.

1. Introduction

The exponential growth and development of emerging and innovative technologies made positive impact on higher education especially in teaching and learning environment. In these circumstances the computer aided learning (CAL), Computer Assisted Language Learning (CALL) and Mobile Assisted Language Learning (MALL) are need of the hour. In this context the LIS professionals needs to use cutting edge technologies to assist the digital and online learners of the 21st century. Today, social media has become a catalyst in reshaping the manner in which individuals and organizations do their businesses, collaborate or communicate and create relationships with colleagues, peers and prospective audiences. Social media has also become an increasingly familiar tool employed in academic libraries to promote services and highlight resources to current and prospective patrons. As libraries yearn to remain relevant to the contemporary audiences, social media is viewed as an important tool for enticing and retaining patrons who are already familiar with and immersed into the social media world.

The simple act of having conversations and creating relationships with patrons is immensely useful. Through conversations on social media, libraries can gain insights into what their users want and need and ultimately understand their users' better.[1] The social mobile messaging apps social effect that comes from the social circles of individuals, and their involvement when using such apps have significant positive impact on their actual usage of and user satisfaction toward the technology. While profitable performance of new technology depends on Understanding factors affecting users 'usage behavior and satisfaction, few studies have investigated these factors in developing social mobile messaging apps. Hence Librarians started learning the use of latest Information and

communication technologies as well as mobile tools available in the market and use them for the benefit of their users, teams of their workplate, for the professional development. In this paper the researcher narrates the experiences in adaptation of WhatsApp to provide user friendly library and information services at SCSVMV University, Kanchipuram. This case would be a test bed for other libraries and LIS professionals.

2. WhatsApp Messenger

WhatsApp Messenger is a cross-platform mobile messaging app which allows exchanging messages without paying for SMS. WhatsApp Messenger is available for iPhone, BlackBerry, Android, Windows Phone and Nokia like smartphones. And these phones can share though messages, images, video and audio media messages among each other! Because WhatsApp Messenger uses the same internet data plan that are used for email and web browsing, there is no cost to message and stay in touch with your friends.

3. Services provided through WhatsApp

- **Library Alerting services**
- **Library Video (Lecture, Seminar, Workshop)-** Information about orientation programmes, lectures on special topic, news in relation to scholarly work, awards. Short messages regarding the library events and news can be sent the users personally.
- **Library Book Location:** Users may be provided with the virtual vision of the library sections and their services.
- **Audio message:** Libraries can provide audio tour of a library. It can provide the guidelines of library rules and regulations to the library users.
- **Recommendations can receive for Procurement of Books:** Librarian can receive the suggestions from the users sent via mobile phones. So that the users need not visit the libraries and write the requirements in the register provided for that.
- **New Arrivals:** This can be used to disseminate the information about newly acquired books or other materials which are of irrespective for forms.
- **Current Awareness Services/ Selective Dissemination Services:** To disseminate the content of the peer reviewed journals can be sent to the users as per their field of interests.
- **Newspaper clippings:** Newspaper clippings related with the education, technology and societal issues can be circulated among the groups.
- **Notices/Circulars:** Notices/Circulars of the organisation can be circulated among the users. This will help them to keep their knowledge up-to-date.
- **Reminding the user** if, book is due in his/her account by informing them about the exact fine.

- **Just like the customer care service,** research scholars may have an interaction with library to get suggestions as well as consultations through mobile phones.

4. Library Professionals in WhatsApp Groups

Academic Library, Caliber 2015, Dream Librarian, India Libraries, Library Group, LIS Friends, LIS Professional, Telangana Librarians, MALA Members, SALIS Members and LIS Members and much more. These are all the groups are witnessing that our Librarians are already adopted the services of sharing their knowledge through WhatsApp.

5. SCSVMV University Library: A brief Profile

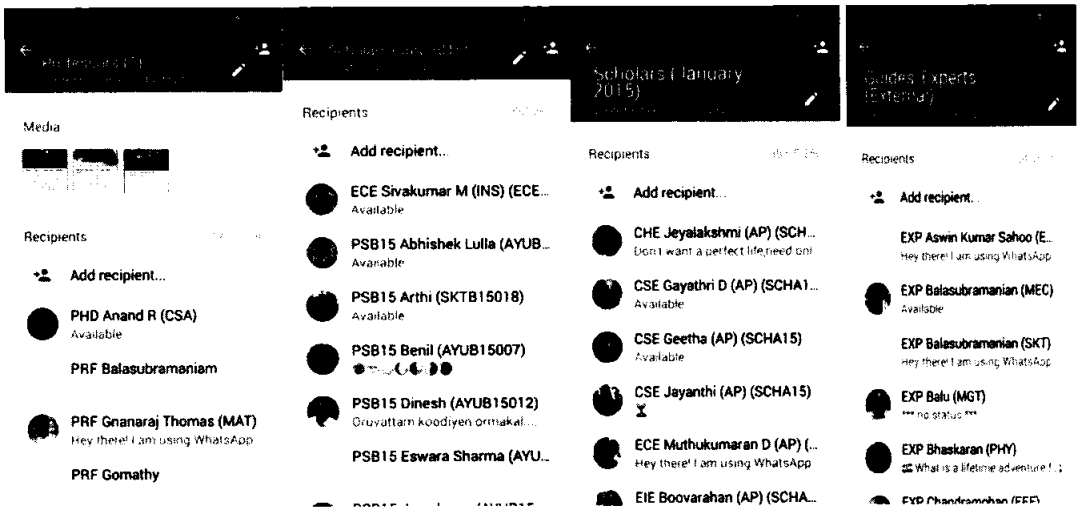
Sri Chandrasekharendra Saraswathi International Library Established in 1995, housed in Sri Jayendra Saraswathi Diamond Jubilee Mahal is a unique facility in the University. Spread across an area of 7,500 sq. feet occupying spacious accommodations in three floors, the library provides an ideal ambience for reflection and study. The library plays a vital role in supporting teaching learning and research through lending. Reference and enquiry services there are around 200000 books ,current periodicals and expanding range of electronic services including over 1,000 tapes and CD ROMS of which the library dedicates a deserve a collection of books to the IT World and subscribes to over 100 specialized national and international journals. In order to meet the contemporary needs of library user, the library is offering following value added services further reference can be accessed through this url: www.kanchiuniv.ac.in/library/

- Book Circulation Service
- WebOPAC (Online Public Access Catalogue) facility
- Effective Reservation Service
- Journal and Magazine Section
- Online Access to e-Resources
- News paper-clippings Service
- Internet facility
- Inter Library Loan and Document delivery service (DELNET/INFLIBNET)

6. WhatsApp services in SCSVMV University:

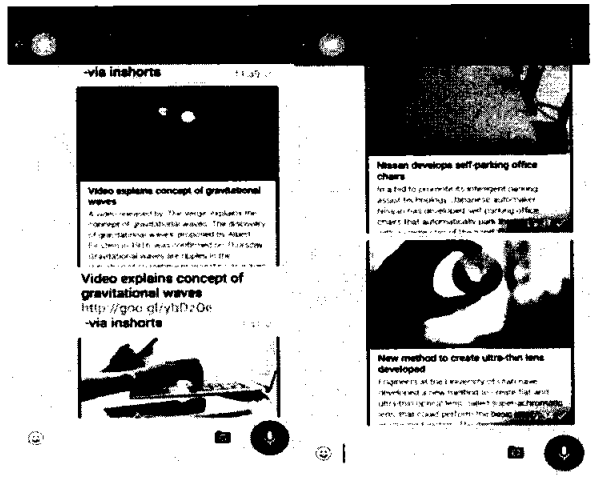
The SCSVMV University library service has been started by the information to the users by using the WhatsApp. Here is the few usage samples of Whatsapp services provided from University. In the research wing, they have started this service. Here are the few Screenshots...

Display screen of users



The library users are created according to the user's category of professors, research guide and research scholars by entering their mobile no. and their name and their subject in the bracket for easy identification of user belonging to particular subject in the library mobile App and subject wise groups. This has been done only to the users belonging to the universities. The information's are sent to all users without any restrictions.

7. Display screen of Information Delivered



The information's are searched in the internet according to the subject wise and the information is sent to particular group's concern department to professor, research guide and to research scholars. The common information is sent to all users irrespective of subject. \This service enables them to get the latest information on their subject field in their mobile device which is very easy for them to read.

8. **Do's in WhatsApp Services**

- Information that is relevant to concern group is to be posted.
- Information Sharing and Knowledge Exchange is encouraged. General awareness information and Infotainment is welcome....but not forwarded messages
- BREVITY is a MUST! But meaning should not be lost in the process.
- Language for communication is English.
- Regional Languages/International Languages welcome but only if accompanied by English translation
- Videos should be accompanied by one line description so that other members can decide if they would like to check it out or not
- Just a occasional hello (at least once a week) from every member or a self or a picture of the workplace of member most welcome

9. **Dont's in WhatsApp Services:**

- Do not post 'very long' messages. Nobody has time and patience to scroll down long messages.
- Do not spam. Occasional reminder is welcome. If one is marketing ones Seminar/Conference/Workshop . For Example write "Last Day/Two Days/Three Days....to submit Camera Ready Paper" More details at URL.
- Do not be rude or abrupt in conversations. Constructive criticism. It is expected that all members respect other members opinions even if they do not agree with it.
- Do not make spelling mistakes
- Do not 'coin' your own abbreviations of words - follow standards
- Do not be silent spectator. Try to participate in discussion.
- Do not change group icon or logo or picture posted by the group admin without informing.
- Do not share the group admins mobile number without taking consent first due to privacy issues.
- Do not post in regional language unless the group is a regional group.

10. **Group Admins/Librarian**

- Monitor to see that group members are posting relevant information or ensure that you steer them in right direction.
- Give warning to members who do not follow group rules. If the member persists then he/she can be removed.
- Appreciate the active members and encourage the non-active members to share.

- Post topics for discussion
- Do not remove group members without advance warning.

11. Conclusion

Implications of Social Media use in Libraries is important for librarians to understand that even if they do not wish to engage with social media in their personal lives, or in their professional sphere, they still need to be knowledgeable in SMTs. Responses to this services indicates that there is considerable amount of experience and enthusiasm among library staff to engage with social media in order to deliver their library service in different ways, or reach different audiences, or try new communication methods. It allows users to create, connect, converse, contribute, vote and share information. Social media is helpful in accessing information needs of online users and helps libraries to get closer to users. The whatsApp services are very fast to deliver the information to the users at the right time in speed mode and it reaches the users mobile devices. The SCSVMV University has successfully implemented this service for the benefit of library users.

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A Concept of Creation of Metadata Schemas

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Abstract: In this 21 century, nowadays every universities, organisations or institutions are doing digitized their resources or library collections. This article is guide for collection developers at the point of considering a metadata schema for their digital collection development. This article will assist a developer in clarifying how he wants the collection to be organized, described, and used for information seekers. This article shows information that how developers guided the development of digital collection built at their universities.

Keywords: Metadata, Metadata Schema, Dubline Core (DC), Types of Metadata Schemas

1. Introduction

In this article the formal metadata schemas and related standards giving brief descriptions and links. A single digital object may serve a variety of purpose reaching a broader audience than traditional library resources. As a result of this type of multiplicity it may be difficult to know how to organize and describe an object. The descriptive metadata schema is exists to address all possible purposes so the author calls it 'the Goldilocks problem'. This article is designed to assist digital collection developers and librarians who are at the point of considering how to choose schema and assign metadata. It can be a daunting task if the library collection developer and librarian are not familiar with metadata and may not be certain steps to take to develop a model for describing and administering the library collection. This article uses to guide the development of a digital collection.

A metadata framework can be viewed as having five key components:

- A schema is 'the categories of information you choose to record data'
- Vocabulary (specific 'words' or 'values' you have to enter into those categories)
- Conceptual model - the underlying model that describes how all the information and concepts inherent in resource are related
- Content standard – this standards that describe how specific information should be entered within metadata schema element
- Encoding - it is concerned with the way the metadata is presented

2. Metadata and Metadata Schemas

Metadata is structured information and that describes, explains, locates, or makes it easier to retrieve, use, or manage an information resources. Metadata is often called data about data, knowledge about knowledge or information's information. The Metadata

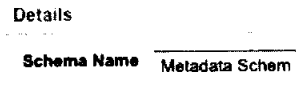
Schema is used to define the metadata fields that need to be filled out on the Metadata screen of a skill. Every schema defines the fields and their type, whether or not it is compulsory, the default value of the field, whether or not it can be edited and which fields emerge in the HTML (Hypertext Markup Language) source code of the page. Every creator can create as many Metadata Schemas as they want in the system.

- Details Screen
- Usage Screen
- Sections
- Fields

Formerly you have added a Metadata Schema; creator can configure its settings on its associated ability screens. These screens are often the same or comparable to those for a Standard Page and are described in the ability Screens manual. In this article, we will describe the Details and Usage screens, which are different for an Image.

- **Details Screen**

The Details screen allows you to set up your Metadata Schema by adding sections and fields.The Details section of the Details screen is shown in the figure below.

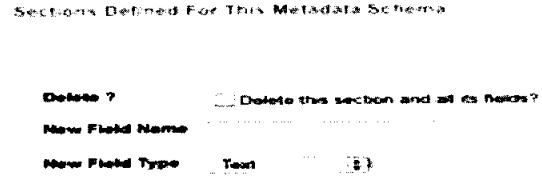


The Details section of the Details screen

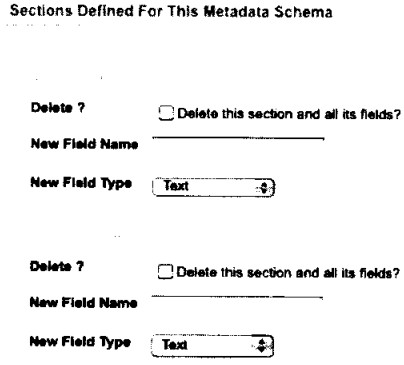
By default, the name that was entering into the Schema Name field when the Metadata Schema was created will appear in this section. Creator can change the name of the Metadata Schema by clicking into the Schema Name field and entering the new name for the Metadata Schema.

- **Sections Defined for this Metadata Schema**

This section shows the section and field that have been added to the Schema. It also allows you to delete fields and sections also. If you have not added any sections than no information will appear it is as shown in the figure below. The Sections for This Metadata Schema section with no defined sections: When you add a section it will appear in this section of the screen as shown in the figure below.



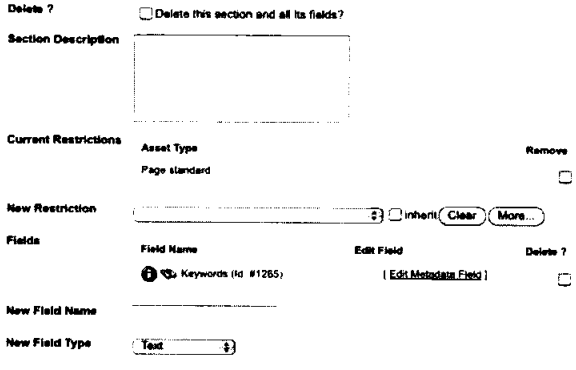
Each blue heading represent a section that has been added to the Metadata Schema. For example: in the form below, there are two blue headings appear - User Defined and System Defined. This shows that two sections have been added to this Metadata Schema.



Metadata Schema section with two sections

For each section listed following fields are available:

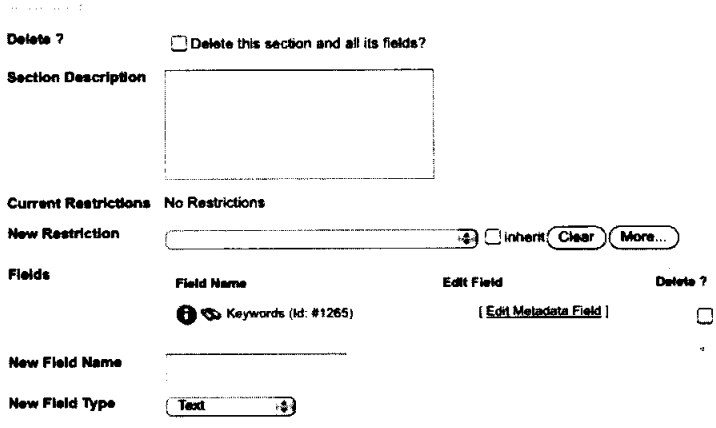
- **Delete:** in this section, to delete a section and all of its fields, click this box and click Commit. The section will be removed or deleted from the Metadata Schema.
- **Section Description:** by default, this field will not represent on the display until you have added a metadata field to the section. Once you have added a metadata field in this section, this field will permit you to enter a description for the metadata section that can then be displayed on the Frontend.
- **Current Restriction:** by default, this field will not show on the screen until you have added a metadata field to the section. Once you have added field, this section will list which advantage types this metadata section will be applied to. By default, no skill types will be listed. Once you have selected an skill type from the New control list, it will show in this section, as shown in the figure below.



A Current Restriction on a metadata section

If no skill types are listed, the metadata section will be displayed for all resources that the Metadata Schema is applied to.

- **New Restriction:** by default this field will not show on the screen until you have added a metadata field to the section. Once you have added metadata field, this field allow you to restrict which skill types the metadata section is applied to. For example, if you are going to concern the Metadata Schema to all skill in your Site but only want this metadata section and its fields to be functional to Standard Pages, select Standard Page from the list. To select multiple skill types, click the Morebutton. An additional field will show on the screen. The skill types that have been selected will show in the Current Restrictions list.
- **Fields:** in this field lists the metadata field that has been added to the section. If you have not added any field to the section, no information will show, as shown in the form below. When you add field, it will show in this section of the screen, as shown in the figure below.



A metadata field in a metadata section

3. Type Of Metadata Schema And Standards

There are so many schemas that have been developed for assured types of data and if the data matches a developed schema the use of those schemas will result in the best metadata for that data. However, so many of these schemas are exact compound and need for a certain level of proficiency to implement that preclude their use by many. Some metadata schemas and standards are shown below in brief.

1. **Cataloguing Cultural Objects (CCO):** The CCO is data content standard and it is providing guidelines for entering data into schemas relating to cultural objects which is particularly the VRA Core and CDWA Lite. The CCO was developed by the US-based Visual Resources Association (VRA) with most significant input from the Getty Research Institute.

2. **CARARE:** The CARARE is metadata application profile and that is based on the MIDAS historic environment data standard. The schemas support descriptions regarding monuments, buildings, landscapes and their representations. It can include digital resources like that images, maps, plans drawing and 3D models. The application profile was developed as a part of a Europeana project and it has been used by Europeana to ingest metadata from heritage resources. It is currently in version 2.0.
3. **Categories for the Description of Works of Art (CDWA):** The CDWA is an extensive metadata schema for cataloguing objects and it is held by art museums. It was developed in the US in the year of 1990 by the National Endowment for the Humanities (NEH); College Art Association (CAA), and J. Paul Getty Trust. It is maintained by the Getty Research Institute. A second edition of CDWA was published in 2000. An XML encoding of selected category from CDWA was developed in 2005, called CDWA Lite. The CDWA Lite is intended to work with the CCO data content standard & the OAI-PMH encoding and harvesting standard.
4. **Conceptual Reference Model (CRM):** The CRM is conceptual model, providing formal definition and structure for describing the concept and relationship used in cultural heritage documentations e.g. by museums or archives. The CRM is not metadata schema but it can be used as tool for analyse & mapping obtainable schema or as a guide to create new schema. The development of the MIDAS standard has been influenced by the CRM. It can be represented as XML and used within Semantic Web applications. It was developed by the International Committee for Documentation (CIDOC).
5. **Describing Archives: A Content Standard (DACS):** The DACS is US content standard for archival description. It is based on ISAD (G). It is published by the Society of American Archivists (SAA) in 2004 and only available in print, it provides guidance on how information about archival resource might be entered into schemas such as EAD or MARC 21.
6. **Dublin Core (DC):** The Dublin Core is a generic metadata schema (i.e. intended to be able to describe any type of resource). It has been widely used and adapted. It developed from the mid 1990 through a process of international collaboration; it is maintain by the Dublin Core Metadata Initiative (DCMI). In its simple 15-element form, Dublin Core has achieved NISO & ISO standardisation. In accumulation, there is also a larger set of element and sub-element (DCMI Metadata Terms) and several Application profile. There are various ways to encode or express DC metadata including XML, RDF and HTML format. Many of the other schemas in this listing have been based on or influenced by DC and most schemas have recognized mappings to DC for the purpose of interoperability.
7. **Encoded Archival Description (EAD):** The EAD metadata schemas provide an XML encoding for archival description. It adopt a multi-level approach to description, provide information about collection as a whole and then breaking it down into group, series and (if significant) individual item. It grew out of work done at UC

Berkeley in the mid-1990 and was influenced by TEI &ISAD(G). Version 1.0 was released in 1998 with major revision in 2002 (Version 2002). EAD is maintain by the US Library of Congress and Society of American Archivist, but is used internationally, including the UK. The DACS content standards provide guidelines for US archivists on how to enter data into EAD.

8. **EXIF (Exchangeable Image File Format):** The EXIF is technical metadata standard that can be written to and read from a still image and audio file and supported formats are, TIFF, JPEG and WAV (it does not support the PNG or JPEG2000 image format). It was developed by JEITA (Japan Electronic & IT Industries Association) to enable camera manufacturer to write technical data into digital image e.g. camera settings. Although primarily used by digital camera, some scanner will also write EXIF data. The latest release of the EXIF standard was in 2010.
9. **FRBR (Functional Requirements for Bibliographic Records):** FRBR is a conceptual model for describing information resource within library context. It describes particular entity (e.g. altem or a Person) and their relationships (e.g. Item is owned by Person). Like the CRM, FRBR is not a metadata schema, but a model that can be used to analyse accessible schemas or influence the development of new schemas or content standards. It is presently being drawn on in the development of the RDA content standard. FRBR is an international model. It is published in 1998 by a working group of the International Federation of Library Associations (IFLA). This working group was established in 2002 to review and advance develops the standard. One of its tasks is to look at how FRBR and the CRM can be related.
10. **IEEE LOM (Learning Object Metadata):** The IEEE LOM provides metadata schema for relating learning resource. The first part of the standard, the set of metadata category, was published in 2002. A later part, published in 2005, outlined how LOM was to be encoded as XML. The UK LOM Core provides a UK version of the IEEE LOM.
11. **IPTC (International Press Telecommunications Council):** The IPTC is both the name of an organisation and descriptive metadata schema. The IPTC schema can be written to and read from an image file itself. From the mid-1990s, during the Council's work with Adobe, it has been probable to embed IPTC metadata direct into the header of JPEG and TIFF image file. In 2005 the Council released "IPTC Core", standard for using IPTC within Adobe's XMP schema. This enables IPTC data to be incorporated (via XMP) into a wider range of image formats like e.g. JPEG, TIFF, JPEG2000, PNG, DNG, SVG. In June 2014 IPTC Core 1.2 was released.
12. **ISAD(G) (General International Standard Archival Description):** The ISAD(G) outlines metadata element that should be used in the description of archival collection. It adopt a multi-level advance to description, provide information about a collection as a whole and then breaking it down into group, series and (if significant) individual item. ISAD(G) has partial national archival standards and the development of the international archival encoding schemas: EAD and the European SEPIADES schema. It is in its 2nd edition, published in 1999.

13. **ISAN (International Standard Audiovisual Number):** The ISANs can be comparing to ISBN (International Standard Book Number) for printed matter. They are system of unique identifier for analogue or digital resource which are used to make sure stability across catalogue.

14. **LRMI (Learning Resource Metadata Initiative):** The LRMI has worked to make it easier to print, discover, and distribute quality educational resource on the web. The LRMI was spurring by the announcement in 2011 of Schema.org, project by Bing, Google, and Yahoo to create a standard way of tagging online contented.

15. **MARC (Machine-Readable Cataloguing):** The MARC is family of metadata standards for representing library resource. Although chiefly used by libraries to describe bibliographic material like books or periodicals, it is also sometimes used to describe non-book material e.g. images or archival collections. MARC is very extensive and formalised standard, with hundreds of potential categories and a rigid way of encode its data. In the past, individual countries developed their own versions of MARC (e.g. UKMARC), but many are now converging to the present version: MARC 21 and t is published in 1999 and maintain by the US Library of Congress. A MODS provides sub-set of MARC encoded as XML. Many libraries have relied on the Anglo-American Cataloguing Rules for supervision on how to enter data within MARC, but this will be replaced by the new Resource Description and Access (RDA) content standard.

16. **METS (Metadata Encoding and Transmission Standard):** The METS is standard for encoding metadata within an XML format. Although it contain descriptive and administrative element of its own, a key function of the METS standard is to structure or "package" other metadata or data for exchange or relief. METS can embed or link to other XML-based metadata; e.g. MODS, MIX, PREMIS or TEI, see below. Any number or type of digital file can be described and linked together by METS record, enabling it to represent very complex digital resource e.g. a whole digitised book, with bibliographic data, images and transcribed text. The METS grew out of work in the mid 1990 on the Making of America II (MOA2). Nowadays it is maintained by the US Library of Congress. The METS 1.1 was released in 2001; the current version is 1.5 which is released in 2005.

17. **MIDAS Heritage: the UK Historic Environment Data Standard:** The MIDAS is UK standard for describing cultural heritage resource that form the historic environment like buildings, archaeological sites, shipwrecks, interest areas, artefacts and ecofacts. The MIDAS was published by English Heritage in 1998 and it released v1.1 in 2012. It is now being developed by the Forum on Information Standards in Heritage (FISH). The progress of MIDAS has been influenced by both SPECTRUM and the Conceptual Reference Model (CRM).

18. **MIX (NISO Metadata for Images in XML):** The MIX is an XML-based schema for encoding the NISO technological Metadata for Digital Still imagery standard. It is being develop and maintain by the US Library of Congress. MIX could be

incorporated within any XML based metadata, but is mostly intended for use within METS. MIX is currently in its second version.

19. **MODS (Metadata Object Description Schema):** The MODS is an XML-based metadata schema for encoding information about library resource particularly books. It is based on a division of the MARC 21 standard. The first version 1.0 was released in 2002. The current version is 3.5 published in 2013. The MODS is maintained by the US Library of Congress and is often used with METS.

20. **MPEG (Moving Pictures Expert Group):** This Group (MPEG) is working group of ISO/IEC with the mission to develop standard for coded representation of digital audio and video and associated data. Since 1988 when it has been established, the group has produced standard that help the industry offer to end users an ever more enjoyable digital media experience also. In it 25 years of activity MPEG has developed an imposing portfolio of standard and technologies that have created manufacturing worth several hundred billion USD. In world where information technology, consumer electronic, entertainment and telecommunication product and content variously converge by incorporating increasingly sophisticated technologies and the necessity for timely existing standard is as strong as ever. It provides a perfect mechanism to bring research results into standards that promote industry innovation for the benefit of all.

21. **OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting):** The OAI is an important initiative to facilitate the interoperability of metadata record. The OAI Protocol for Metadata Harvesting (OAI-PMH) provides means of requesting metadata records from OAI-compliant repository. It works by 'harvesting' from dataprovider, metadata that has been made accessible in a standard XML format. This harvested metadata can then be searched collectively from one place a data service. In order to take benefit of OAI, those maintaining DR (digital repository) or collections must afford an encoding of their metadata as simple DC, although other metadata schema can be furthermore supplied. The current version of OAI-PMH is 2.0 and released in 2002.

22. **NISO Technical Metadata for Digital Still Images:** The NISO Technical Metadata is data dictionary rather than a formal metadata schema: a list of categories of data that might be used to define the technical aspects of raster-based digital images e.g. TIFF, JPEG, GIF. The standard is very extensive and few if any implement it in its entirety. NISO Technical Metadata does not specify any particular encoding so the MIX standard is being developed to represent it as XML for incorporation into other XML-based schema e.g. METS. Work started in 1999 and its current version was made presented in 2006.

23. **P/Meta:** The P/Meta is the European Broadcasting Union's (EBU) own metadata standard and it is developed by EBU member on not-for-profit base. It is anticipated to be used to replace media between professional media broadcasting organisation. The P/Meta was designed to be stretchy and appropriate for use in wide range of broadcasting actions and be both language and system independent. The latest version 2.2 release and made in 2011.

24. **PBCore:** The PBCoreor the Public Broadcasting Metadata Dictionary is proposed for use by television, radio and web broadcasters and hope to be a standard way of recitation and using this metadata, allow content to be more easily retrieved and shared among colleagues, software system, institution, community and production partner, private individuals and educator. It can be used as guide for an archival or asset management process at an individual institution. As with other, primarily technical, metadata standards PBCore can be included to cover technical metadata within structure such as a METS record.
25. **PREMIS:** It is like NISO Technical Metadata PREMIS provides a "dictionary" of core metadata element that can be used to support the digital preservation of resources. It was based on an international survey of practice and on earlier research and development. It was typically influenced by conceptual model called the Open Archival Information System (OAIS), which provideconceptual framework for preservative digital (and non-digital) resource. The current version of PREMIS 2.3 was finalized in 2014 but planning has started version 3.0. The authorized website provides an XML-encoding for PREMIS which is anticipated to enable its use with other XML based metadata such as METS.
26. **Resource Description and Access (RDA):** The RDA is data content standard like CCO or DACS. RDA is intended to provide organize on how data should be entered into library based metadata schema. It represents major review of well-known library standard called the AACR. RDA will draw on the FRBR concrete model and will focus on the use of library standards like that MARC. In 2013 the LC and the British Library authoritatively adopted RDA as their cataloguing content standards.
27. **SEPIADES (SEPIA Data Element Set):** It provides metadata schema for describing archival photographic collection. It is based on ISAD (G), adopting a similar multi-level approach to description. It was developed by the European funded SEPIA Project (Safeguarding European Photographic Images for Access in 2000-2003). It was published in 2003 as set of Recommendation for cataloguing photographic collections. It doesn't provide certain encoding but in 2004 one of the SEPIA partner released a cataloguing tool that incorporates the standard and generates records in a DC format suitable for harvesting under OAI-PMH.
28. **SPECTRUM:** It is key UK standard for museum documentation. It recommends units of data or information that can be used to document museum procedure and objects. It was first published in 1994 and currently in its 4th edition released in 2011, is developed and maintained by the Collections Trust.
29. **Text Encoding Initiative (TEI):** This is a standard for describing and encoding literary texts. The head part of an encoded work TEI Header provides metadata regarding the work, while the remainder of the marks upfile to the transcribed text, indicating chapters, paragraphs, and other noteworthy features. It was founded in 1987 (first version) released in 1990. However, it is version P3 (released in 1994) that most TEI implementers have used. It was based on SGML, a precursor to XML,

so version P4 (released in 2002) changed the standard into XML. The latest version (2014, v2.7) is P5. In adding, there is a simplified version of TEI called TEI Lite.

30. **VideoMD:** It was designed by the LC and is a schema specifically constructed to define the technical features of digital video. The schemas use 36 top level elements and are expressed as XML. This does not purpose to cover all aspects of video resource only the technical features like VideoMD is best used in conjunction with other system like that within METS records. This schema is well distinct and exhaustive.

31. **VRA Core:** The VRA Core is widely used metadata schema for describing art or cultural image and providing 17 core categories. The latest version is VRA Core 4.0 (2007). It was initially based on CDWA but next versions have been heavily influenced by DC. The new version 4.0is derives on the CCO content standard and provide an XML encoding for VRA Core.

32. **XMP (Extensible Metadata Platform):** The XMP is an XML-based open Adobe standard and used within Adobe's imaging software and also by growing number of third parties. It can incorporate metadata from other schemas like that DC and IPTC and write this data into an image file.

4. Conclusion

This article will inform to any library professionals for their advanced knowledge regarding metadata schemas. Metadata plays a critical role in the content development and scalable collections of organized resources. Though metadata is different from library catalogue records, it is evident that metadata evolved from library catalogue records and its successor, Machine Readable Catalogues (MARCs). The metadata has wider scope than library catalogue records as events, processes, products, people, institutions, software, multimedia, products, services, e-governance, e-learning, to name a few. But again, various authority files like personal name authority, corporate name authority, series authority, subject authority files that are basically deemed as legacy of bibliographic databases have reflections in various metadata schema. LC transformed authority files into Metadata Authority Description Schema (MADS). Hence it can be concluded that catalogue records got evolved into Machine Readable Catalogues which in turn got evolved into some metadata schemas.

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Big Data and Semantic Web Technologies for Digital Information Processing: *An Overview*

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Abstract: The exponential growth and development digital content in different flatworms and formats are the biggest challenge for digital curators in digital and networked environment. To find solutions to these problems there are technological tools are available for wider dissemination information. In this context the Big data analytics and semantic technology will help us to integrate the digital content. In this paper authors presents the an overview of these technologies for digital information processing using different URIs to represent data, usually in triples based structures: i.e. many triples of URI data that can be held in databases, or interchanged on the World Wide Web using a set of particular syntaxes developed especially for the task. These syntaxes are called "Resource Description Framework" syntaxes. The concept when applied to the internet "extends the network of hyperlinked human-readable web pages by inserting machine-readable metadata about pages and how they are related to each other".

Keywords: Big Data, semantic web, ontology, Knowledge Organisation, Resource Description Framework (RDF) , Linked open data.

1. Introduction

The idea of the Semantic Web involves annotating documents with 'semantic mark-up', that is, mark-up that is not interpreted for display but rather as an expression of document content. This is often described as 'a Web for machines' as opposed to a Web to be read by humans. Semantic web can function in situations where a computer has adequate access to structured information collections and rules of inference for the purpose of conducting automated reasoning. The Semantic Web has to provide a language which will be capable of expressing both data and a set of rules for providing a reasoned framework to the data.

The concept of the semantic web is one in which there is a connection established via software tools for the purpose of establishing relations between web pages. As a part of what the web really constitutes, the semantic web enhances the meaning of information by providing a mechanism by which the web can understand user demands and comput

protocols for utilizing the information present on the web. The Semantic Web provides a common framework that allows data to be shared and reused across applications, enterprise, and community boundaries. It is a collaborative effort led by W3C with participation from a large number of researchers and industrial partners. Its objective is to convert all the unstructured documents on the web into a web data. It is based on the Resource Description Framework (RDF).

2. Digital Information Processing with Big Data

Big data is the term given to those data sets which are large and have a complex structure. They include large amount and many types of digital data which are generated from online transactions, images, videos, audios, health records, science data, social networking interactions, mobile phones, etc,. Big data comprises of information which cannot be stored, processed, managed or analyzed using typical database software tools. In Relational database systems, data was of controlled and structured type such as data entered into a spreadsheet with specific rows and columns but big data sets contain unstructured data that are difficult for further processing or analyzing. As compared to the traditional methods of data analysis, big data requires innovative and contemporary methods of data processing and analyzing as it is characterized by three main components – variety, velocity and volume. Volume refers to the size of data which is now greater than terabytes and petabytes. Because of the large scale the existing methods of storage and analysis cannot be applied. Traditional software can handle megabyte and kilobyte data sets. The volume of data also created also depends upon the discipline of study. There is no single definition of big data but most analysts refer to data sets from 30-50 terabytes to multiple petabytes as big data.

Librarians should understand the potential impacts of big data and its effects in various researches undertaken by the researchers. The library information professionals play a major role in the big data universe. This is because the library professionals have the necessary skills, the knowledge, the talent and the service mind to help all clientele irrespective of whether they are from universities, governments, non-profit organisations or corporate bodies handling big data. Thus, semantic-based approaches are considered as useful means of dealing with very large-scale data such as big data. Using semantics the information professionals can provide effective library services. It acts as a remarkable tool for libraries where it protects the copyrighted information and helps in sharing the wealth of knowledge. (Laura,G 2012). Knowledge representation is the area of Artificial Intelligence (AI) concerned with how knowledge can be represented symbolically and manipulated in an automated way or digitized way by reasoning programs. It is the part of AI that is concerned with thinking, and how thinking contributes to intelligent behavior. Knowledge representation is thus the field of study concerned with using formal symbols to represent a collection of propositions believed by some putative agent.

"Semantics" is a term used by both logisticians and linguists to describe the study of meaning. On a very basic level, the field explores how concepts are codified into language

through a system of symbols which thereby facilitate communication between entities. Natural human language is an exceedingly complex medium, however, especially when considered in light of the protean nature of the word. Depending on the context, a single word can variously function to signify multiple different concepts, while a single concept may, likewise, be potentially signified by a multiplicity of words. When a series of words, such as a document, is brought together into precise permutation, the result of this gathering is the generation of a contextual environment that itself serves to potentially house larger and more complex meaning. Moreover, as the environment emerges into being, it may then have the reciprocal effect of serving to inform and generate precise meaning in the very words from which it is composed.

3. Web 3.0 Semantic web components and Importance in the digital Era

The web 3.0 is popularly known as the Semantic web. According to the inventor of WWW, Tim Berners Lee it is the third generation of the Web. It is developed by Tim Berners Lee during 2006. But the concept was not new as during 1960s Allan M.C already coined that concept for the first time as "Semantic Network Model". The main purpose of web 3.0 is to define structure data and link them in order to more effective discovery, automation, integration, and reuse across various applications. Web 3.0 or semantic web is also known as Read, Write & Execute web. The Semantic Web can be defined a web of data and it also known as the Meaningful Machine process data which can be processed by machine as well as human. In semantic web the device will be able to exchange between each other and generate information. The aims of semantic web is to merge web resources with machine understanding data to enable peoples and computers to work in cooperation and to simplify to sharing and handling information's in large qualities. It moves from web of documents to open interconnected web of data. The Web 3.0 is connecting contents and allowing people to interact and collaborate in Internet era which refers to communication gaps between human web users and computerized application.

The importance of semantic web for the present digital Era is as follows:

- **Integration of Data sources**: Semantic Web leads to the alliance or the synthesis of data sources or the sources of information to make information retrieval process
- **Reduces Information overload**: A major concern for developing semantic web was information explosion. Hence semantic web helps in reducing the information overload and helps in dissemination of required information Makes content available on web: Another major advantage of Semantic web is making the required content or information available on the web. This leads to web flexibility
- **Stability**: Web 3.0 is considered to be more stable than web 1.0 and web 2.0.Semantic web makes the World Wide Web more stable and the information provision is more suitable and flexible.
    - To make availability of concept and context based content on web
    - Make a user's life easier by the aggregation and creation of validity and reliability information over the Web;

- Multilingual purposes and Multilingual processable as well as accessible.
- Integration of diverse data sources;
- Generating new knowledge for the people.
- Design of information;
- Data use strategy;
- Mechanism for acquisition existing data sources

The main components of Semantic Web are as follows:

- **URI:** It identifies the resources about which the Semantic Web provides reasoning capabilities. "URI have two main uses, and one URI can be used in both senses. These are **Uniform resource names (URN)** are URI that are used to name something, even if this is an abstract object that is not available on the Web.
- **Uniform Resource Locator's (URL)** are URI that are used to specify the location of something. URI must start with a protocol identifier and URL typically use protocols that have a well-established technical interpretation that tools can use to access the specified location" (semanticweb.org).
- **XML:** The XML is used for store, carry and exchange the data. It is a format for uniform data exchange between applications.

  RDF: The RDF structure is based on the three main concepts: Subject (Resource), Predicate (Property) and Object (Statement), **relationship is called a triple.** The Subject or Resources is things it may be all things like peoples, table, chair, books etc. The Objects or Properties is specific resources. And the Predicate or Statement is Values.
- **SPARQL:** The SPARQL is Simple Protocol and RDF Query Language. It is used for semantic web data resources or RDF based data.

Apart from SPARQL we need to use Rule Interchange Format (RIF), Semantic Web Rule Language (SWRL) and other ontology languages. The Web ontologies are important for processing web information, which was developed by W3C. The three species of OWL are **OWL Full, OWL DL** and **OWL Lite. (Alotaibi, S. 2010).**

4. Needs of ontology in Digital information processing

The Ontology is one of an important component of the semantic web which describes knowledge. It is a formal, explicit specification of a shared conceptualisation of a domain of interest. Ontologies were developed in artificial intelligence to facilitate knowledge sharing and \re-use. It combines all concepts. Ontology is important in the search better with accuracy. "Ontologies, through formal semantics, are machine understandable. A computer can process data annotated with references to ontologies and through the knowledge encapsulated in the ontology gather facts from the original data. Ontologies make knowledge explicit, thus making it easier to see what kind of data is

maintained by an application and to understand the meaning of the data".(Gruber, T. R 1995) Ontology may be considered as a kind of method to represent knowledge.

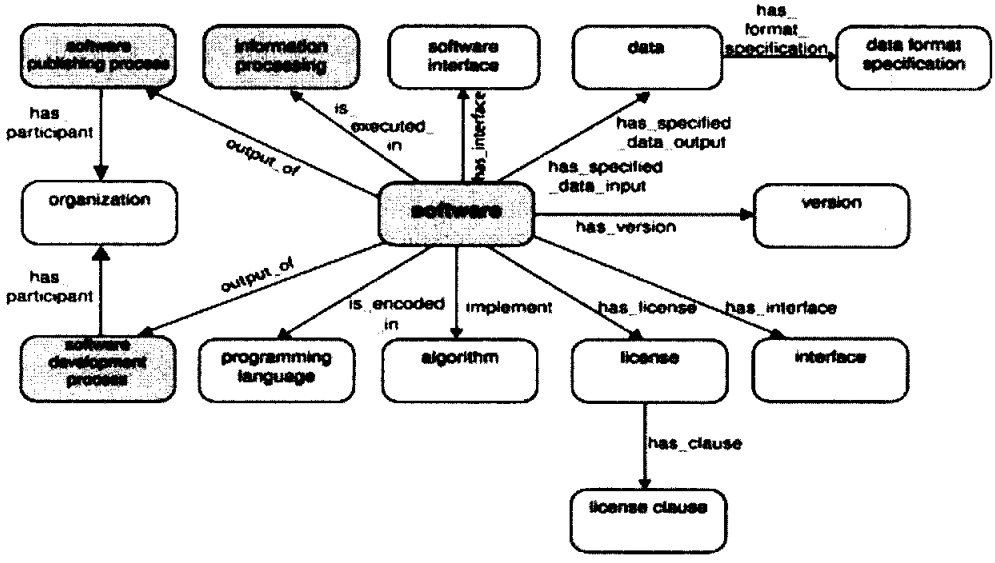
Model elements might also be made use of for the purpose of searching and retrieving the concerned documents. There is the opportunity for calculation of a model of similarity between documents on the basis of this particular conceptual structure. This leads to the identification of a domain for the purpose of retrieving documents for a user. The use of Ontology for retrieval of information is still an abstract concept that could stand to gain a lot more development. The main idea is to come up with strategies that will link together information bearing models and documents in a more sensitive way for the purpose of delivering it to the end user. While this stands to be a winning concept, a lot of future work still needs to be done for the purpose of development of this concept.

5. Linked open data and Semantic Web in Digital information processing

The Semantic Web will bring order and structure to Web Content pages, enabling the creation of a sophisticated environment where software agents running from one page to the next may carry out certain tasks for users. The Semantic Web is not a separate web, but rather an extension of the present day web where information has been given more concrete context and meaning, enabling users and computers to work in cooperation with one another. An essential notion of the World Wide Web being that of universality, the concept of the Semantic Web is geared towards providing a World Wide Web platform that will help in the achieving of this. The ultimate power of the Semantic Web will achieve realization when users engage in the creation of multiple programs collecting web content from diverse sources, processing the information and sharing the same with other programs. The efficiency and effectiveness of such software will grow manifold as machine readable web content and automated services are made available. Before going to organize knowledge in information system an organizer have to think about own mind, information and record it, think about data it is retrievable or not, evaluate it and finally select the information and understand the information, analyze, after analyzing process it for use. The following are the important process of knowledge organization:

- Acquisition of the data
- Classify the data
- Storage the data
- Retrieving of data
- Editing of the data
- Aggregation of the data
- Description of the data
- Test and analysis of data
- Implication of data

- Distribution of the data
- Evaluation of the data effectively and efficiently



Source: http://www.biomedcentral.com

Figure 1: illustration of Linked open data model in semantic web

6. Conclusion

In traditional knowledge organization tools concept of processing was known as organizing. It involves Taxonomy, Indexing, codifying, classification and cataloguing etc. The present anthologies semantic web knowledge organization application involves ontology and its tools such as PoolParty, Protégé and other helps to link between one concepts to another concepts and organize or arrange the digital collections in systematic manner. After processing of the knowledge library must be store in specific repository and archives. To store the knowledge the concept and context is very important. This involves the 5 W and 1H concept. It means who, what, why, when, where and how it will be store and share in semantic web environment.

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Creating a Digital Library: *Issues and Challenges*

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Abstract: The term "Digital Library" has a variety of potential meanings, ranging from a digitized collection of material that one might find in a traditional library through to the collection of all digital information along with the services that make that information useful to all possible users. A Digital library could be accessible anywhere, anytime over the internet using a web browser on desktop. It can be accessed "Just in Time" 24 hours a day and 365 days of the year. A digital library is much more than just the collection of material in its repositories. It provides a variety of services to all of its users (both humans and machines, and producers, managers, and consumers of information). The concern that libraries as we have known them may didapper from physical space to be reconstituted in cyber space is not warranted. The internet and web are key components of Digital Library and these components impetus and technological environment for the development and operation of Digital Libraries.

Keywords: Digital library, Digital library product & services, DL challenges

1. Introduction

Information Technology is the acquisition Processing, storage, dissemination and used of the vocal, pictorial, texture and numeric information by a micro electronic based combination of computing and telecommunication based combination of component in IT has enabled us to change the tradition are the main component to the new system called "Digital Libraries" . The term "Digital Library" has a variety of potential meanings, ranging from a digitized collection of material that one might find in a traditional library through to the collection of all digital information along with the services that make that information useful to all possible users. As the WG discussed possible scenarios and challenge problems to drive our discussion of metrics, we found the need to come to at least a loose agreement on the scope of the digital library. This document is intended to serve that purpose (SURAJ, V.K 2005)

Much of the question about the scope of the term is how broad a view should be taken of the digital library. Does it encompass all of information management or is a more tightly constrained view appropriate? In this document, and for the purposes of the deliberations of the WG, we choose to take a very broad view. This is driven by the recognition that to do otherwise would require setting boundaries that are fairly artificial. The structure of this document is as follows. In the first section, a brief definition of the term "digital library" is

given, as a set of characteristics. The remainder of the document elaborates each of those characteristics (VYAS, KAILASH NARAIN, 2005)

2. Need and Importance of Digital Library

- A Digital library could browse and search its catalogue, borrow digital copy of a book (download, print) find newly added books, make reservation.
- A Digital library could be accessible anywhere, anytime over the internet using a web browser on desktop. It can be accessed "Just in Time" 24 hours a day and 365 days of the year.
- A single digital copy would be sufficient to serve a large number of users.
- A digital library could provide access to much richer content, in a more structured manner.
- Emergency of the internet and web technologies as a media of information delivery and access.
- Availability of highly evolved, extra ordinary simple and intuitive user interface, i.e. internet explorer and Netscape navigation for all prevalent platforms.
- Advances in online storage technologies enabling storage of large amounts of contents at increasingly affordable cost.

3. Digital Library Access Tools And Sources

There are various tools available to use digital information system and they facility in accessing, searching, browsing, navigating, indexing, storing of digital information. These tools include.

- **On-Line Public Access Catalogue (OPAC):** The on-line public access catalogue (OPAC) is fully integrated with the file containing the bibliographic, authority and circulation translation information.
- **CD-ROM:** CD-ROM (Compact Disc-Read Only memory) is a silver plated disk of 1.2 mm (0.047 inches) thickness and 12 cm. (4.72 inches) diameter. In it information is permanently stored.
- **Microfilm:** Microfilm Readers and Reader-Printers are more frequently readily available in the engineering and research community including education institutes.
- **Microfiche:** Standard microfiche offers the advantages of very low initial production cost, low distribution cost and convenience for filling.
- **Audio-Visual Tools:** Librarians have cautiously admitted audio-visual material into the library collection simple as illustrative matter subordinate to the printed knowledge stored in books (VYAS, KAILASH NARAIN, 2005)

4. Challenge in Creating Digital Libraries

- **Technical Architecture:** Technical Architecture is the first issue that underlies any digital library system. Libraries need to enhance and upgrade current technical architecture to accommodate digital materials.
- **Digitization:** One of the primary methods of digital collection building is a digitization. What does this term mean exactly. An obvious obstacle to digitization is that it is very expensive.
- **Copyright:** The current paper-based concepts of copyright break down in the digital environment because the control of copied is last. The problem for librarian is that, unlike private businesses or publications that own their information.
- **Cost:** A major assumption of the information age is that information will be available to all for a face. This assumption runs counter to the ethos that underline library. Building digital libraries will be a costly and lengthy process.

5. Digital Library Product and Services

- The collection of services: A digital library is much more than just the collection of material in its repositories. It provides a variety of services to all of its users (both humans and machines, and producers, managers, and consumers of information). Thus we start our definition with the notion of the collection of services that the digital library represents. There are a large and varied set of such services, including services to support management of collections, services to provide replicated and reliable storage, services to aid in query formulation and execution, services to assist in name resolution and location, etc.
- The collection of information objects: The basis for a digital library, however, must be the information objects that provide the content. A basic characteristic of the digital library is that the information objects are found in collections with associated management and support functions. The types of information objects vary from traditional "documents" through to live objects (e.g. sensor readings) or dynamic query results.
- Supporting users deal with information objects: The goal of the digital library is to assist users by satisfying their needs and requirements for management, access, storage, and manipulation of the variety of information stored in the collection of material that represents the "holdings" of the library. Users may be humans or they may be automated processes acting on behalf of or in support of human needs. Users also vary and include those who are "end" users (those not involved in the management and operation of the library but rather are the customers), library operators, and information "producers" who want their material available through the library.

- Organization and presentation of those objects: The key to effective collections management is to implement simple structural organizations and be able to present those organizations in a way that library users find useful and can understand easily. In traditional libraries, books are primarily stored by subject, title, author, and date, and accessed by following signs to the appropriate floor, room, bookcase, shelf, and spine-labeled book. The size and relative celebration of each portion of the collection gives patrons information about the collection and can reveal the library's collection management objectives as well.A library is created to serve a community of users. Users who participate in the digital library should be aware of its design and be able collectively to refine that design to better serve their own information needs. Therefore, the ongoing human usability of a digital library depends on the clear and unobtrusive exposure of the library's design, its near-term goals, and its overall objectives.
- Available directly or indirectly: These information objects may be digital objects or they may be in other media (e.g. paper) but represented in the library via digital means (e.g. metadata). They may be available directly over the network (e.g., using a query service of the library to find and then retrieve electronically the information object) or indirectly (e.g., the result of the query may give instructions on how to obtain the object, but that is done outside the scope of the library itself.)

5. Traditional Library Vs Digital Library

- For centuries knowledge has been gathered, recorded, organized and stored in repositories of various kinds.
- Digital libraries are like traditional libraries in that they involve large collections of diverse information and there issues concerning organization, retrieval, access, storage, archiving and preservation of the information.
- The concern that libraries as we have known them may didapper from physical space to be reconstituted in cyber space is not warranted.

5. Conclusion

Much of the question about the scope of the term is how broad a view should be taken of the digital library. Does it encompass all of information management or is a more tightly constrained view appropriate? In this document, and for the purposes of the deliberations of the WG, we choose to take a very broad view. Technical Architecture is the first issue that underlies any digital library system. Libraries need to enhance and upgrade current technical architecture to accommodate digital materials. Therefore, the ongoing human usability of a digital library depends on the clear and unobtrusive exposure of the library's design, its near-term goals, and its overall objectives. Furthermore, digital libraries should continue the ongoing tradition of coupling utility with aesthetics in the organization and presentation of materials.

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Data Mining: *Implications and Techniques*

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Abstract: This paper introduces the concepts of data mining and explains why they are regarded as such important developments. It is also brings several important aspects that why data mining is important and how it is define. It is gives the general Data Mining Technologies, Data Mining Techniques. In addition, it has studying advantages of data mining and research portal in field of medical sciences.

Keywords: Data mining, Implications, Techniques

1. Introduction

Data mining is the process of collecting, analyzing and summarizing research data from different sources and converting it into useful information. Many researchers' needs references and information about previous researches done in their particular area of interests, traditional way of getting such references is journals, libraries, news published, books, conferences, etc. extracting useful information from such sources was a manual and tedious task and needs too much time. Moreover advances in information technology made such difficult and time taking task within a reach of single click. Many of the libraries have established reference services in the form of different database services. Large amount of data has been stored and made available through internet from anywhere of the world; this database referring or searching such databases for useful references is called as data mining. Data mining, or knowledge discovery, is the computer-assisted process of digging through and analyzing enormous sets of data and then extracting the meaning of the data. Data mining tools predict behaviors and future trends, allowing businesses to make proactive, knowledge-driven decisions. Data mining derives its name from the similarities between searching for valuable information in a large database and mining a mountain for a vein of valuable **ore.** Both processes require either sifting through an immense amount of material, or intelligently probing it to find where the value resides. The analytical techniques used in data mining are often well-known mathematical algorithms and techniques. What is new is the application of those techniques to general business problems made possible by the increased availability of data and inexpensive storage and processing power. Also, the use of graphical interfaces has led to tools becoming available that business experts can easily use.

Data mining helps analysts recognize significant facts, relationships, trends, patterns, exceptions and anomalies that might otherwise go unnoticed. In the businesses, data mining is used to discover patterns and relationships in the data in order to help make better business decisions. Data mining can help spot sales trends, develop smarter marketing campaigns, and accurately predict customer loyalty. Specific uses of data mining include:

- Segmentation - Identify the common characteristics of customers
- Customer churn - Predict which customers are likely to leave your company

- Fraud detection - Identify which transactions are most likely to be fraudulent-
- Direct marketing - Identify which thing included in a mailing list to obtain the highest response
- Interactive marketing - Predict what each individual accessing interested in seeing.
- Market basket analysis - Understand what products is commonly purchased
- Trend analysis - Reveal the difference between typical customers

2. Importance of Data mining

In recent Era a great deal of attention in information industry and in society has been attracted by the data mining. This is due to the wide availability of huge amount of data the need for turning such data into useful information and knowledge. The information and knowledge gained can be used for application ranging from management and market analysis, engineering and science exploration. Hence the data mining can be viewed as a result of the natural evolution of information technology. The precious information is embedded in large databases.

3. Data Mining Technologies

The analytical techniques used in data mining are often well-known mathematical algorithms and techniques. Some of the tools used for data mining are:

- Artificial neural networks
- Decision trees
- Rule induction
- Genetic algorithms
- Nearest neighbor

4. Data Mining Techniques

The overall goal of data mining process is - to extract information from data set and transform it into understandable structure for further use. Actually it is practical machine- which is used for learning tools and techniques with term data mining was only added for marketing reasons. The more appropriate term for data mining is data analysis, machine learning, or artificial intelligence. It uses information from past data to analyze the outcome of particular Probability or situation that may arise. The Data mining works to analyze the data workhouses that are used to store that data. The Ultimate goal is "Prediction." Predictive data mining is most common type of data mining, it consist three Stages:

- **Exploration:** This first stage of the process of data mining may involve anywhere between a simple choice of straight forward predictors for a regression model, to elaborate exploratory analyses using a wide variety of graphical and statistical methods in order to identify the most relevant variables and determine the complexity.

- **Model Building and validation:** This stage involves considering various models and choosing the best one based on their predictive performance.
- **Deployment:** That final stage involves using the model selected as best in the previous stage and applying it to new data in order to generate predictions or estimates of the expected outcome.

5. Implications of Data Mining

The integration of data mining techniques into normal day-to-day activities has become commonplace. We are confronted daily with targeted advertising, and businesses have become more efficient through the use of data mining activities to reduce costs. Data mining adversaries, however, are concerned that this information is being obtained the cost of reduced privacy. Data mining applications can derive much demographic information concerning customers that was previously not known or hidden in the data. The unauthorized use of such data could result in the disclosure of information that deemed to be confidential.

6. Conclusion

We have recently seen an increase in interest in data mining techniques target to such applications as fraud detection, identifying criminal suspects, and prediction of potential terrorists. These can be viewed as types of classification problems. The approach that is often used here is one of "profiling" the typical behavior or characteristics involved. Indeed, many classification techniques work by identifying the attribute values that commonly occur for the target class. Subsequent records will be then classified based on these attribute values. Keep in mind that these approaches to classification are imperfect. Mistakes can be made. Just because an individual makes a series of credit card purchases that are similar to those often made when a card is stolen does not me that the card is stolen or that the individual is a criminal.

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Digital Libraries of Different Ministries in India: *A Review Report*

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Abstract: This paper is deals with the digital libraries in different ministries in India. The paper explains the errors were made in the handling of the situation, must be identified & procedures put in place to prevent their happening again. Further the study consists of literature review related to digital library initiatives in different ministries of India at National, and International levels. Secondary data were searched from print and online resources.

Keywords: Digital Library, E-resources, Indian Ministries, Literature Review.

1. Introduction

A literature review is an account of what has been done on a topic by accredited scholars and researchers, a piece of discursive prose and explaining the intellectual progression of the field. Literature review might present the historical perspective, initial development and the current situation, possibilities of new inventions, including problems and issues raised, arguments discussed, strengths and weaknesses, to enhance knowledge, sharpens understanding and broadens researchers" perspective on Digital Libraries in different ministries of India.

2. Statement of the Problem

The motivation for Library work is based on two recognized research issues for digital library. One is the need for interlinked and semantically rich information spaces where relationship information is of particular importance. The other is the service oriented architecture of digital library. The digital library of the future will consist of smaller and independent services that each will provide different functionality and access to different contents. These two highly orthogonal research issues lead up to the specific problem statement explored in literature research which is: *How to provide a service for using and managing relationships in DGCA-digital library.*

3. Purpose and Approach to Literature Review for DGCA – Library

The purpose of literature review is to establish the Digital Library and information Centre and suggest ideas for another research, reporting published materials on existing conceptual framework, theories, techniques, processes, styles and instruments of other researchers related to the topic under investigation.

The approach to literature review was the browse method where print and electronic sources were looked at, read and digested, looking for some relevancy, appropriateness and usefulness of the topic at hand. Predetermined keywords used during the search were digital library, virtual library, e-library, hybrid library, digital library initiatives, digital library problems, digital library research, digital services, digital reference, resource sharing, distributed information resources, Intellectual Property Rights, digitization, online databases, dematerialization, born digital materials, information surrogates, digital objects, information revolution, library automation, library systems, hybrid library, cyberian, information professionals, digital librarian, global access, repositories and interoperability.

As the research involved qualitative data as well, the research team (Library team) made a lot of efforts at the initial stage of the research making enquiries to get as much primary data as possible from as many librarians as possible whenever there were opportunities, to understand the subject better and helped in the formulation of the research questions. The Library strategic goals to expand outreach and improve the user experience shaped the primary objectives.

- To increase awareness by sharing information from more than its library's collection with users who enjoy information on civil aviation but might not visit the library.
- To gain better understanding of how tagging and input could benefit both the library and users of the collection in the Global information system.
- To gain experience participating to the emergent web communities that would be interested in the kinds of materials in the Library collections.
- A growing number in the world Libraries get benefit by the possibilities of this model will follow library's Lead in the field of.

4. Challenges of digital library

The Library of like many other organisations, faces a number of challenges as it's seeks to increase discovery and use of its collections and special formats materials easier to find in order to be useful for. At the same time resources are limited for providing detailed descriptions of for the many thousands of items in research collection.

5. Strategy for digital library

One solution worth exploring is to participate in existing web communities and authorities that offer networking functionality. Reaching out to unknown as well as known audiences can more people to connect, share and interact with library by library. Taking collection to where researches are already engaged in conversations might also encourage visit to a Library's where full wealth of its resources are available.

- **Vision:-**Responsive to the needs of its reader, researchers and authorities within their rapidly changing information requirements & environment

- **Mission:** Library shall endeavour to explore avenues and opportunities to promote and of maintain equitable access to relevant, quality material & information in the field

6. Literature Review: A Report

A study Report from the literature review, it is very clear that the development of digital library has been widespread, and the topic has been much talked about, discussed and written as summarized in table – I, given below thus, making it the library of the future. We professional librarians are talking full advantage of existing website.

Due to urgent requirement of our library, we would like to have an "additional tag' on our existing website, so that Library could be accessed throughout the world Digital library can be accessed at any time, 24 hours a day and 365 days of the year.

- Digital library will provide/ access much richer content in a more structured manner.
- Digital Library can provide the link to any other resources of other more very easily thus a seamless integrated resource sharing can be achieved on "Zero based budget".

Digital Library project is indeed big understanding, heavily technology dependent, requiring proper planning on "Zero cost based budget".

The literature of the 2015's reporting on digital library initiative and anything that is related to it. We are in transition period from traditional library to Global digital library phenomena. The idea is to provide universal access to digital content available only in a digital library by library the study indicates that the libraries boundaries are diminishing and concept of disintermediation is becoming clear. It is remarkable that how many digital library initiative projects from the last 40 years has made the transition. There is a panorama richly populated with real services delivering information to literally millions and millions users scattered across the cyber oceans of the world. Websites of the different ministries of India have been indicating the additional tag of their library publication, resources, etc. which is shown in table 1 in different ministries of India having stated library automation and transformed electronically, the libraries has started developing digital library initiatives to some extent.

Table 1: Summaries from literature

IN INDIA	Digital – Library in Indian ministries
Digital library initiatives by Indian ministries	1. Ministry of Culture
	2. Ministry of Environment & Forests.
	3. Ministry of External Affairs
	4. Ministry of Railways.
	5. Ministry of science & Technology.
	6. Nitti Aayog.
	7. Institute of Secretarial Training & Management.
	8. Election Commission of India.
	9. High Court of Delhi.

IN WORLD	1. National Libraries of G7
	2. European national libraries
	3. UNESCO
	4. UNESCO & IFLA
Digital Library initiatives by international organizations	5. WORLD BANK : E-Library Service
	6. EUROPEAN UNION
	7. EUROPEAN COMMISSION
Library collection operations and Services	1. Digital based and global access
	2. Digital storage and retrieval
	3. Digital material
	4. Interoperability
	5. Virtual service delivery virtual reference service
	6. Hypertext linkages
	7. Distributed information resources
Digital Library Training	1. Digital Library creation & management
	2. Train and re-Train
	3. Learn and re-Learn
	4. Exposures to latest digital technology
Opinions of information professionals	1. DL is library of the future
	2. Global/Universal access is the trend
	3. DL has huge impact on
	4. Increase in collaboration and strategic efforts
	5. DL-Repositioning of the Profession DL- information professionals to be it savvy
	6. Internationalization of library concept
	7. DL – Libraries are gate ways
	8. Open up for resource sharing.

Literature review on digital library developments worldwide has some prominent point as below:-

- Digital Library is the library of future, characterized by e-resources, distributed information resources dematerialization of library materials, global resource sharing and universal user based. The key concept is the provision of access to digital information and linkage to relevant websites worldwide.
- Digital Library research has been expensively carried out especially at organisational levels including ministries in India.
- Digitization programs are carried out extensively at all levels, national, regional and international, by libraries of governmental organisations
- Digital Library initiatives were more than just information surrogates and online databases
- All of the coordinating and facilitating digital library initiatives are done on collaborative efforts, thus ensuring resource sharing and virtual re-unification of digital resources

- Understanding of digital library issues and several main issues related to specifically relating to the actual definition of what constitute a digital library, Preservation of digital objects.
- The success of Digital Library development is dependent on several conditions factor that must co-exist especially on the human aspect, technology and resource factors.

7. Based on the results of the findings and conclusions gathered we recommend two things for the Library:

(A) "An Additional Tag" on existing website (hyper-link)
(B) Installation of the library software package for processing library books & periodical journals this software may be one out of the following on "Zero – cost based budget".

HOME PAGE: DIGITAL LIBRARY

NEW INITIATIVES : (i) Library Policy (ii) Future Projection		**GLOBAL LINKAGES** with authorities of the world and IIT, Eng. Collages. And other institutes and many more.

- ICAO & 200 civil aviation authorities
- National Libraries of G7
- European national libraries
- UNESCO
- UNESCO & IFLA
- WORLD BANK : E-Library Service
- EUROPEAN UNION
- EUROPEAN COMMISSION

ABOUT DIGITAL LIBRARY& INFORMATION CENTRE

SERVICES FROM DIGITAL LIBRARY

LIBRARY HELPLINE ON REQUEST/DEMAND

- Acquisition
- Accessioning
- Classification

- Cataloguing
- Circulation
- Reference Service
- CA Service
- SDI Services
- Inter library Loan Service
- Referral Service
- Documentation services

8. Alphabetical list of E-Resources/on line Databases

A large number of Electronic resources are available for access through Digital Library System. It includes the reference sources, bibliographic sources, statistical sources, and full text sources. A brief description of these under given resources including subject coverage of search features, database services, document category, etc. are available through the more and more links information for the help of users. The given URL address directly takes to the concerned database. For more information and details visit:-

9. E-Resources Websites

A-Z list of E-Journals http://crl.dgca.nic.in

Federated/Common Search Engines

Knimbus http://knimbus.com/web/home.jsp

- Reference & Citation Sources
- Bibliographic sources
- Citation Analysis Resources
- Financial & statistical sources
- Full text sources

10. Conclusion

To Provide efficient accurate relevant and timely information services to its readers through a systematically organized collection and to maintain active role as an information provider and dissemination to be globally competitive as well as uphold and promote the principles of high ethical standards of library profession at all the time. It would be premature to say about the digital library because a lot will depend upon how well this decision of digital techniques are executed and what results they brings in addition to that, it would have been better to make a digital librarian instead of a digital library. A digital librarian needs to pull up their socks before adopting digital techniques for library .the need of the hours proclaimed and calling digital librarian.

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Digital Library: *An Overview*

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Abstract: Library is a storehouse books and other documents likewise Digital Library is a collection of digital documents which includes e-books, e-journals, e-databases, e-learning resources, e-reference sources including locally digitized documents. This paper presents an overview of Digital library and its principles, strategies, advantages.

Keywords: Digital Library, Open Source Software, Principles of DL

1. Introduction

Knowledge is created by human beings through the ages not only used for their individual development but also meant for the progress of the society. It was kept in the form of Libraries which are called as reservoirs of knowledge. The synonymous of words knowledge information is an essential commodity of human life in the modern period. There were different types of libraries established in the second half of the 20th century which are to the users in our country organizing and providing variety of services. Academic libraries are very important components for supporting educational developments of the institutions. There are several Academic Institutions like schools, Colleges, Universities which are taking good support from their libraries. Among all the said Academic Institutions, Engineering College Educational Institutions attracted by the younger (Youth) generations and encouraging by the parents to get job opportunities at an early date. Consequently the modern world turned up into science and technology

2. Principles in the design of Digital Libraries

The following Principles (Dugan and Tanner, 2002) will guide in the design and development of digital library architecture.

- **Service driven:** The architecture for the digital libraries must be driven by the services it provides and tools required for delivering the service
- **Open architecture:** The architecture must be open, extensible and support interoperability among heterogeneous distributed systems.
- **Scalability:** The architecture must be robust, scalable and reliable in a high transaction rate production setting thousands of patrons with a wide variety of background and information needs.
- **Preservation**: The architecture must ensure persistent access to collection of the digital library, addressing such issues as naming, digital archiving and digital preservation.
- **Privacy**: The architecture must be sensitive to privacy issues and support both anonymous and customized access to resources.

- **Practicality**: The architecture should represent a flexible and practical approach to standards, recognizing the need to balance the level of information collection with economic constrains.
- **Modularity**: The architecture should represent a mix of new technology and legacy pieces, all of which must inter operate while involving at different rates.
- **Time Frame**: The time frame required to plan for system migrations in the coming year as well as planning for a technology generation framework should be approximately 3 to 5 years.
- **Client support**: The architecture should support a base line level of services, which can be accessed with common desktop configuration and software. Contain higher level service may require proprietary clients but digital library tools and services group should determine the support to these clients.

Arms (1995) suggest that eight principles should form the development of digital libraries:

- The technical framework Eight principles should form the development of digital libraries:
- Understanding of digital library concepts is hampered by terminology.
- The underlying architecture should be separate from the content stored in the library.
- Names and identifiers are the basic building block for the digital library.
- Digital Library objects are more than collections of bits.
- Repositories must look after the information they hold
- The digital library object that is used is different from the stored object
- Users want intellectual works, not digital objects Many of the trends and challenges surrounding digital libraries are corollaries of these basic

3. Creating Digital Libraries:

- IT Infrastructure
- Digitalization of Information
- Information Access
- Manpower Planning
- Furniture and Space Planning
- Furniture and Space Planning
- Services 08. Financial Planning.

4. Advantages of Digital Libraries.

- Helps in Resource sharing facilities
- It saves the Library Manpower and Funds
- It saves the Library Manpower and Funds.
- Helps in Inter Library Loan (IIL)
- Help to reach information of their users at faster rate through on-time communication.
- It minimizes the duplication of New Invention.
- Helps the Libraries to get recent publications from the publishers.
- Researchers/Information Scientists will get information with minimum time.
- Helps to get Bibliographical information retrospective search, Union Catalogue, Abstracting and indexing of periodicals.
- Online Library Catalogue through Internet gives access to Bibliographic Records of millions of books and details of holdings of Academic and Research Libraries, E-Journals and Newsletters.
- E-publications provide aids for Connectivity Audio Visualization customizability, creation and revision of documents, Interactivity and Rapid Information Retrieval.

5. Conclusion

Digital Library developers also will find that they need to maintain the role of the library as guardian over individual's rights to access a rich variety of information, and to see that information within its context. They will need to continue to be vigilant about making sure that other forms of "equal access to information" extend to the new digital world. They would also do well to extend the "library bill of rights" into cyberspace, and they will find themselves having to struggle to keep the digital world from increasing the distance between "haves and have notes". Finally, in the move towards constructing digital libraries, we need to remember that libraries are not merely collections of worked. They have both services and ethical traditions and values that are a critical part of their functions. Libraries interoperate with each other to serve the information needs of a variety of different user groups today, and expect to sustain themselves and their collections so that they can serve users 100 years from now. However it may be stated that, the future of library will consist of books, bytes and buildings. "Tomorrow's societies will be knowledge societies. Tomorrow's markets will be knowledge markets. Tomorrow's wars will be fought not by the conventional weapons, guns, missiles and so on, but they will be fought in the knowledge markets with the new thermonuclear weapons called information and knowledge" In the digital Librarianship era the slogan will be "Exit Librarians enters digital librarian/cybrarian". In these lines tomorrow's Libraries will contain all recorded knowledge online, distributed and maintained globally, accessible by any person, in any language anytime, anywhere on earth, via the Internet and act as the information resource for the 21st century (Cycle (Castelli,2006).

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Digital Preservation

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Abstract: The research of the future requires right of access to the research of the past. This access cannot be certain without trustworthy long-term preservation of intellectual digital content. Forthcoming access can be assured with backup and access system redundancy. Mid-term access can be protected with byte duplication. But assertion of continuing access requires digital preservation – the series of management policies and activities necessary to ensure the enduring, authenticity, usability, discoverability, and accessibility of content over the very long term.

Keywords: Digital Preservation, Preservation Policy, Digital Preservation challenges, Preservation Cost

1. Introduction

Nowadays, we have access to information and data those 15 years ago would have scarcely seemed possible. It seems that almost everything is being created and used in the digital area. Documents like your history report, the spreadsheet that shows last year's travel budget and more were likely all generated on your computer. However, we use computers for so many things, we often don't give attention about preserving what we do generate. Most people can remember at least one horror story of lost data, whether it happened to them or to a friend; the research paper that was lost when the computer crashed or the scattered and disordered family photos that were only saved to one hard drive – that eventually crashed! This list of lost digital data illustrates the potential fragility of digital information. There are several reasons why digital objects are so weak.

The preservation of digital content become a major challenge for libraries and archives whose mission is to preserve the intellectual and cultural tradition of the nation. Digital preservation is the active management of digital content over time to ensure ongoing access. There are many institutions is implementing a national strategy to collect, preserve and make available significant digital content, especially information that is created in digital form only, for current and future generations. The institutions are usually assumed responsibility for preserving information face technical, organizational, resource, and legal challenges in taking on the preservation of digital holdings. Digital technologies are used increasingly for information production, distribution, and storage. Digital preservation is a common

concern across libraries, archives, museums, and special collections, or whether Institutions can take action on their own, but there is a strong agreement that coordinated strategies and shared resources are essential to achieving broader solutions to digital preservation and enhancing the success of local efforts.

2. Digital Preservation: Scope And Objectives

The main scope of a digital preservation policy is to achieve the following objectives:

- Preserving and providing continued access to digital material, both born digital and digitized material;
- ensuring that preserved digital materials are authentic;
- preserving damage and deterioration of the physical media by ensuring an environmental control; reversing damage, if it's possible;
- Changing the format of digital materials to preserve their intellectual content, if it's necessary.

3. Requirements of Digital Preservation

Effective digital preservation requires life-cycle management of digital information from the point of creation through storage, migration, and providing access on a continuing basis. Digital preservation major requirements are like Legal requirements, financial requirement, and business requirements and also technical requirements for maintenance procedures of Preservation strategies and forecasting Historical value. Digital preservation is the series of management policies and activities necessary to ensure the enduring usability, authenticity, discoverability and accessibility of content over the very long term. The key goals of digital preservation include:

- **Usability** - the intellectual content of the item must remain usable via the delivery mechanism of current technology;
- **Authenticity** - the provenance of the content must be proven and the content an authentic replica of the original;
- **Discoverability** - the content must have logical bibliographic metadata so that the content can be found by end-users through time; and
- **Accessibility** - the content must be available for use to the appropriate community.
- **Reliability** -contents can be trusted as a full and accurate representation of the transactions, activities or facts to which they attest and can be depended upon in the course of subsequent transactions or activities.
- **Integrity** -Integrity is required to protect the access of digital content even we discard the original storage medium, software and hardware on which the digital content was created, maintained and accessed. Preserving the digital integrity of digital content also involves developing techniques for verifying its alteration from original format.

- **Accuracy** –The data, information, documents or records are precise, correct, truthful, free of error or distortion or pertinent to the matter.

4. Digital Preservation Policy

The digital preservation policy could assurance many benefits at each institutional level, such as ensuring digital materials available for current and future use, providing a comprehensive statement on this theme and planning coherent digital preservation programmes. Besides, the formulation of a policy allows to deal with difficult subjects as the short-lasting life span and small capacities of digital materials, the obsolescence of the hardware required to access them, the obsolescence of software for reading the data and file formats and, finally, the structural and technical heterogeneity of the different types of digital materials.

- Areas of Coverage
- Authority and responsibility
- Conversion and reformatting
- Appraisal, selection and acquisition
- Storage and maintenance
- Access and dissemination
- Implementation
- Standards
- Procedures
- Quality control, auditing and benchmarking
- Cooperation
- Technical infrastructure

5. Organizational Models for Digital Preservation

Three models are broadly acknowledged today for digital preservation of scholarly content:

- **National libraries:** A number of national libraries have taken on digital preservation in support of their mission or their country's legal deposit requirements. The scope of content involved and access terms vary, but all such libraries are government-funded. Examples of this type of organization are the British Library and the National Library of the Netherlands.
- **Community-supported independent preservation archives**: These organizations may focus on a subject area or content type. Typically the costs for the preservation of this content are shared across the participating publishers and libraries. Examples of this type of organization are Portico and the Inter-University Consortium for Political and Social Research (ICPSR).

- **Networked library efforts:** Groups of libraries have pooled their resources to share the responsibility and costs of preservation. Examples include LOCKSS (Lots of Copies Keeps Stuff Safe), CLOCKSS (Controlled LOCKSS), and NDIIPP (National Digital Information Infrastructure Preservation Program – the digital preservation program of the US Library of Congress).

6. Digital Preservation: Challenges

Library alone cannot collect, preserve and make available all the digital information that is worth saving and is at risk of loss, the Library is meeting the challenge of digital preservation in many different ways:

- **Media Failure**. All storage media must be expected to corrupt with time, causing irrecoverable bit errors, and to be subject to sudden catastrophic irrecoverable loss of bulk data such as disk crashes or loss of off-line media.
- **Hardware Failure**. All hardware components must be expected to suffer transient recoverable failures, such as power loss, and irrecoverable failures, such as burnt-out power supplies.
- **Software Failure**. All software components must be expected to suffer from bugs that pose a risk to the stored data.
- **Communication Errors**. Systems cannot assume that the network transfers they use to disseminate content will either succeed or fail within a specified time period, or will actually deliver the content unaltered.
- **Failure of Network Services**. Systems must anticipate that the external network services they use, including resolvers such as those for domain names and determined URLs will suffer both transient and irrecoverable failures both of the network services and of individual entries in them. As examples, domain names will vanish or be reassigned if the registrant fails to pay the registrar, and a persistent URL will fail to resolve if the resolver service fails to preserve its data with as much care as the digital preservation service.
- **Media & Hardware Obsolescence**. All media and hardware components will eventually fail. Before that, they may become outdated in the sense of no longer being capable of communicating with other system components or being replaced when they do fail. This problem is particularly heightened for removable media, which have a long history of remaining theoretically readable if only a suitable reader could be found.
- **Software Obsolescence**. Similarly, software components will become obsolete. This will often be manifested as format obsolescence when, although the bits in which some data was encoded remain accessible, the information can no longer be decoded from the storage format into a legible form.
- **Operator Error**. Operator actions must be expected to include both recoverable and irrecoverable errors. This applies not merely to the digital preservation application

itself, but also to the operating system on which it is running, the other applications sharing the same environment, the hardware underlying them, and the network through which they communicate.

- **Natural Disaster**. Natural disasters, such as flood fire and earthquake must be anticipated. Other types of threats, such as media, hardware and infrastructure failures, will typically manifest then.
- **External Attack**. Paper libraries and archives are subject to malicious attack there is no reason to expect their digital equivalents to be exempt. Not as good as, all systems connected to public networks are vulnerable to viruses and worms. Digital preservation systems must either defend against the inevitable attacks, or be completely isolated from external networks.
- **Internal Attack**. A lot of misuse of computer systems involves insiders, those who have or used to have authorized access to the system. Even if a digital preservation system is completely isolated from external networks, it must anticipate insider misuse.
- **Economic Failure**. Information in digital form is much more vulnerable to interruptions in the money supply than information on paper. There are ongoing costs for power, cooling, bandwidth, system administration, domain registration, and so on. Budgets for digital preservation must be expected to vary up and down, possibly even to zero, over time.
- **Organizational Failure**. The system view of digital preservation must include not merely the technology but the organization in which it is embedded. These organizations may die out, through economic failure, or their missions may change. This may deprive the digital preservation technology of the support it needs to survive. System planning must visualize the possibility of the asset represented by the preserved content being transferred to a successor organization, or otherwise being properly disposed of. For each of these types of failure, it is necessary to trade off the cost of defense against the level of system degradation under the threat that is regarded as acceptable for that cost.

7. Digital Preservation

- **Costs**

COSTS	Technical infrastructure	Equipment purchases, maintenance and upgrades
		Software/hardware obsolescence monitoring/review
		Network connectivity
	Financial plan	Strategy and methods
		Commitment to long-term funding
	Staffing infrastructure	Hiring training
		Ongoing training
	Outsourcing	

- **Technological Infrastructure:**

  - create and capture digital content
  - transfer objects within digital repository
  - interact with digital repository
  - find , build, maintain and deliver stored objects or repository
  - define and implement the policies and protocols that pertain to the repository
  - Integrate the repository and the digital materials into the broader organizational environment and the contexts in which it operates

Most of the organizations which have digital content are familiar about technology—hardware, software, networks, staffing—can either enable digital preservation program. Here are the some examples of technologies that may be required to make digital objects both render able and understandable:

- basic data encoding (e.g. EBCDIC, ASCII, Unicode, big-endian, little-endian, word size)
- file formatting and compression schemes (e.g. Microsoft Word 97, AutoCad 10, JPEG, TIFF, JBIG, LZW)
- storage media specifications (e.g. 3.5" floppy diskette, 12 cm optical disk)
- media storage techniques (e.g. magnetic, optical, magneto-optical)
- storage media formatting (e.g. CD-Audio Red Book, CD-ROM Yellow Book, Orange Book CD-R and CD-RW)
- file system specifications (e.g. FAT32, ISO-9660, HFS+)
- operating system environment (BIOS ROMs, system calls, linked libraries)
- storage hardware, with associated firmware, device drivers
- "playback" hardware (e.g. audio/video subsystems and displays and printers)

- **Financial Plan**

Financial commitment may be one of the more challenging areas for organizations which are associated with government entities. In the organization Technology planning, staff training, software development or acquisition, and legal agreements all are multi-year commitments. However, the financial planning structure rarely supports multi-year planning. Components of the financial commitment may includes

- institutional commitment,
- legislative mandate (if there is financial support),
- membership structure (if the digital preservation program is a collaborative or based on a subscription program),

- fund raising and grant programs,
- Fees and other revenue sources.
- Financial sustainability should require collaborative initiative with digital repositories,

8. Digital Preservation Best Practices

Best practices define strategies and procedures that may help organizations to implement existing standards or provide guidance in areas where no formal standards have been developed. Best practices in digital preservation continue to evolve and may contain processes that are performed on content prior to or at the point of ingest into a digital repository as well as processes performed on preserved files post-ingest over time.

Best practices may also apply to the process of digitizing analog material and may include the creation of specialized metadata (such as technical, administrative and rights metadata) in addition to standard descriptive metadata. The preservation of born-digital content may include format transformations to facilitate long-term preservation or to provide better access.

- Audio preservation
- Moving image preservation
- Email preservation
- Video game preservation
- Personal archiving

9. Conclusion

The general summarize of digital preservation challenges is well established. Digital materials are especially susceptible for loss and destruction because they are stored on fragile magnetic and optical media that reduce quickly and that can fail suddenly from exposure to heat, humidity, airborne contaminants, or faulty reading and writing devices. Even if the media are preserved intact, digital materials become unreadable if the playback devices necessary to retrieve information from the media become obsolete or if the software that translates digital information from machine- to human-readable form is no longer available. Libraries, archives, and other repositories that traditionally have assumed responsibility for preserving information face technical, legal, and organizational challenges in responding to the new demands of digital preservation.

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Krishikosh an Institutional Repository of Agriculture: *A study*

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Abstract: The technological advances today make it possible to think in terms of storing all the knowledge of the human race in digital form and several organizations worldwide are experimenting with less-expensive ways to create Institutional Repositories For long-term preservation of our knowledge base and cultures. At present many institutions have repositories and maintain much of its own websites and provides all kinds of information about the functioning. This paper is focused on "Krishikosh" an **Institutional Repository of** Indian National Agricultural Research System "This paper aims to study and analyze the collections in the repository ,it includes Annual reports, Books, Journal, Newsletters, Theses, Photographs and other material useful for the researchers and end users of the libraries. The evaluation process is achieved by grading and ranking. Out of these, some Agricultural **Institutional Repositories** are ranked and finally a model of **Institutional Repositories** is given.

Keywords: Institutional Repositories, NARES, SAU, Krishiprabha, Krishikosh

1. Introduction

Digital technology can make all the significant literary, artistic, and scientific works of mankind permanently digitally preserved and made accessible to the billions of people all over the world. The technological advances today make it possible to think in terms of storing all the knowledge of the human race in digital form and several organizations worldwide are experimenting with less-expensive ways to archive and disseminate scholarly information and in-house knowledge as Institutional Repositories. For example, the California Digital Library's e-Scholarship program at the University of California, ArXiv.org at Cornell University etc support open-access distribution of scholarship in cross-disciplinary through subject-based approach. U.S. Library of Congress' US $100 million National Digital Information Infrastructure and Preservation Program (NDIIPP), which is developing a standard way for institutions to preserve their digital archives. Librarians and computer scientists are working together at MIT for Dspace digital asset management system, which aims to create an institutional repository that will include digitized versions of lecture notes, videos, papers, and data sets—in short, everything produced by faculty and staff.

2. Institutional Repository

An Institutional repository is a digital archive of the intellectual output of an Institution. It makes the quality and breath of scholarship produced at that Institution accessible to others worldwide over the Internet. It is a set of services that a University/Organization offers to the members of its community for the management and dissemination of digital material created by the institution and its community members. It is most essentially an organizational commitment to the stewardship of the digital materials including long term preservation. An effective Institutional repository of necessity represents collaboration among librarians, Information technologies, archives and record managers, faculty and

University administrators and policy makers. It is a new channel for structuring the organization's contribution to the border world and as such invites policy and cultural reassessment of this relationship. It also form part of a larger global system of repositories which indexed in standardizes way.

3. Krishikosh an agricultural Institutional Repositories in India

Krishikosh is made up two words from hindi, the word Krishi means Agriculture and Kosh means Theca,a case .So Krishikosh is a case of Agricultural knowledge created in the NARES of India.(Indian Agricultural Research & Education System) The Institutional Repository under NARES. The repository of knowledge in agriculture and allied sciences, having collection of old and valuable books, records and various documents spread all over the country in different libraries of Research Institutions and State Agricultural Universities (SAUs). Nowadays, it is a trend of Institutional repositories all around. Many of the institutions have their repositories which they have built on various open source software. The saddest part of this is that various institutes had created these digital repositories for testing or trial purpose only and could not maintain the pace to streamline those. Many of them are closed and are not being updated regularly. Following is the list of Agricultural institutional repositories from India which are currently active on the Internet.

4. Need of the Study

In this information revolution age, online information services provided every day, every moment in all field of human activity. This study attempts to explore coverage Agricultural Institutional Repositories on internet. On taking consideration, wider and utility of this topic, undoubtedly, this is the surely beneficial to all library professionals and agriculture researchers in this study.

5. Objectives of the Study

- To study the agricultural Institutional Repositories available on Internet in India.
- To study collections available in Krishikosh Institutional Repositories in India.
- To evaluate the subject wise Databases available in Krishiprabha: Krishikosh.
- To evaluate the ranking of top users views of Institutional Repositories in India.

6. Scope and limitations of the study

An Evaluation of Institutional Repositories in Krishikosh includes a study based on the Internet., There are 45 state / Deemed universities Institutional Repositories available on Internet, out of these the study is restricted to 36 Institutional Repositories in Krishikosh. Here is studied the data available on Homepage of Institutional Repositories in Krishikosh. The study is limited to 36 Institutional Repositories available in Krishikosh.

7. Analysis and Interpretation of Data

Data is collected by using the websites of Institutional Repositories available on Internet. It was designed to find out the data available on the Institutional Repositories homepage. The data has been analyzed and interpreted.

Table 1: State wise distribution of Institutional repositories in Krishikosh

Name of the State	No. of Institutional Repositories
Gujrat	**01**
Rajathan	02
West Bengal	02
Maharashtra	03
Orisa	03
Himachal Pradesh	01
Haryana	02
Andhra pradesh	04
Telangana	01
Uttarakhand	01
Delhi	03
Uttarpradesh	02
Kerala	02
Chatisgarh	01
Karnataka	06
Tamilnadu	02
Total	**36**

The table 1 shows that, State wise distribution of Institutional repositories in Krishikosh, 36 institutional repositories are active properly on the Internet and the maximum no. of institutional repositories in agricultural universities in India i.e., Karnataka 6,Andhra Pradesh 4,Maharashtra, Orisa ,Delhi is 3.

Table 2: Top Country wise views on Krishikosh

Top Country	Users Views
India	37
France	04
China	03
United States	02
Canada	01

The table 2 shows that, top country wise users views on krishikosh Institutional repository. The highest views of krishkosh in India i.e, 37.

Table 3: Top City wise Users Views on Krishikosh

Top City	Views
New Delhi	09
Surat	03
Bellary	02
Patna	02
Saintlous	02
Zengzhols	02
Banglore	02
Indore	01
Rourkela	01

The table 3 shows that, top City wise users views on krishikosh Institutional repository, the highest users views of krishikosh in New Delhi .i.e, 9.

Krishiprabha: Krishiprabha is a full Text electronic database of Indian Agricultural Doctoral Dissertations submitted by research scholars to the 36 State/ Deemed Agricultural Universities. This database has been created by Nehru Library, Charan Singh Haryana Agricultural university ,Hisar with financial support from Indian council of Agricultural Research , New Delhi under it's national Agricultural Innovation project.All 36 state/deemed universities maintain a institutional repository namely krishikosh.

Table 4: Subject wise Databases available in Krishiprabha

Sr No	Subject	Databases
1	Agricultural Engineering & Technology	167
2	Agriculture	4990
3	Basic Sciences	1366
4	Dairy Science	169
5	Home Science	345
6	Veterinary & Animal Sciences	1236
	Total	8273

The Table 4 shows that subject wise database available in Krishiprabha. The highest no of databases available on the subject of Agriculture and Basic Sciences.

Table 5: Agricultural Universities and collections available in the Institutional Repository Krishikosh

Name of IR Universities	Books	Journals	Reports	Theses	Institutional Publications	Proceedings	Reprints	Others
AAU	91	--	01	21	07	----	----	06
ANRAU								
CAZRI	46	85	---	-----	188	---	---	---
CIFRI	---	----	24	---	---	---	---	11
CIFE	211	18	38	---	---	11	---	----
CIFA	05	---	03	---	15	10	---	---
CMFRI	42	242	21	---	---	01	42	----
CPCRI	---							
CPRI	121	79	56	---	----	35	----	24
CRRI	---	02	25	---	-----	----	---	---
CSSRI	09	---	44	---	79	----	---	---
CCSHAU	18	125	209	293	---	----	----	---
DOOR	90	59	205	---	----	68	---	---
GBPUAT	256	---	----	---	----	----	---	---
IARI	4845	5431	50	2350	---	11	292	197
IASRI	274	284	1315	----	---	----	---	73
IGFRI	----	----	08	----	16	---	---	----
IIFR	91	---	---	---	---	---	---	---
IISR	216	---	22	----	35	26	---	17
IVRI	326	1015	---	---	---	---	---	---

IGKVV	---	---	----	01	---	----	---	---
MPKV	1805	03	28	----	----	----	02	01
NAARM	90	---	04	---	---	---	---	--
NBAII	368	34	02	---	---	---	---	01
NBPGR	65	---	24	----	39	---	---	---
NBSSLP	136	03	78	---	----	---	----	---
NDRI	---	---	34	---	168	---	1173	---
NIRJAFT	----	----	01	---	15	----	---	---
NRCC	01	----	----	----	----	----	----	----
NRCCF	68	----	17	---	---	---	----	----
OUAT	155	----	----	----	----	----	---	----
PJTSAU	1961	999	102	2537	36	08	---	40
PDOP	----	-----	39	----	29	-----	----	----
TAU	963	364	64	498	----	06	----	----
UAHS	----	-----	02	03	04	----	---	---
UAS	970	6011	485	596	19	171	----	287

The Table 5 shows that maximum no. of Books available in Institutional repository is, Indian Agriculture Research Institute, Pusa, New Delhi i.e. 4845 Maximum no of journals are available in University of Agricultural Sciences,Banglore.i.e.6011 and Indian Agricultural Research Institute Pusa, New Delhi i.e.5431.Reports are available in Indian agricultural statistical research Institute ,New Delhi i.e.1315.Maximum no of theses available in professor Jayashankar Telangana State Agricultural research Institute, i.e.2537 and Indian Agriculture research Institute, New Delhi i.e.2350.Institutional publications are available in Central Arid Zone Research Institute i.e.188,and National Dairy Research Institute, Bangalore i.e. 168. 68 proceedings are available in Directorate of oilseeds Research,1173 Reprints are available in National Dairy research Institute,Banglore.11 agriculture universities institutional repositories are collection with training manuals, Research Highlight, Photographs and related material about Institutions.

Table 6: Agriculture Institutions in Krishikosh

Sr No	Name Of Institutions	Place of Institutions	Websites
1	Anand Agricultural University	Anand (Gujarat)	www.aau.in
2	Acharya NG Ranga Agricultural University	Hyderabad (Andhrapradesh)	angrau.ac.in
3	Central Arid Zone Research Institute	Jodhpur(Rajastan)	www.cazri.res.in
4	Central Inland Fisheries Research Institute	Kolkatta(WestBengal)	www.cifri.res.in
5	Central Institute of Fishiries education	Mumbai	www.cife.edu.in
6	Central Institute of Freshwater Aquaculture	Bhubaneswar	www.cifa.in

7	Central Marine Fisheries Research Institute	Kochi	www.cmfri.org.in
8	Ceatral Plantation Crops Research Institute	Kudlu,kesaragod,(Kerala)	Cpcri.gov.in
9	Central Potato Research Institute	Shimala(Himachal Pradesh)	Cpri.ernet.in
10	Central Rice Research Institute	Cuttack (Orissa)	Crri.nic.in
11	Central Soil Salinity Research Institute	Karnal(Haryana)	www.cssri.org
12	Chaudhary Charan Singh Haryana Agricultural University	Hisar(Haryana)	www.hau.ernet.in
13	Directorate of oilseeds Research	Hyderabad(Andhra Pradesh)	www.icar.org.in
14	Govind Ballabh Pant University of Agriculture & Technology	Pantnagar(Uttarakhand)	www.gbpuat.ac.in
15	Indian Agriculture Research Institute	Pusa (Delhi)	iari.res.in
16	Indian Agriculture Statistics Research Institute	New Delhi	www.iasri.res.in
17	Indian Grassland and Fodder Research Institute	Jhansi (Uttarpradesh)	www.igfri.res.in
18	Indian Institute of Horticulture Research	Bengaluru (Karnataka)	www.iihr.ernet.in
19	Indian Institute of Spices Research	Kozhikode (Kerala)	Spices.res.in
20	Indian Veterinary Research Institute	Bareilly (Uttarpradesh)	www.ivri.nic.in
21	Indira Gandhi Krishi Vishvavidyalaya	Raipur (Chhatisgarh)	www.igau.edu.in
22	Mahatma Fule Krishi Vidypeeth	Rahuri (Maharashtra)	mpkv.ac.in
23	National Academy of Agricultural Research Management	Hyderabad (Andhra Pradesh)	www.naarm.ernet.in
24	National Bureau of Agriculturally Important Insects	Bangalore	nbair.res.in
25	National Bureau of Plant Genetic Resources	New Delhi	www.nbpgr.ernet.in
26	National Bureau of Soil Survey and Land use Planning	Nagpur	www.nbsslup.in
27	National Dairy Research Institute	Banglore	www.ndri.res.in
28	National Institute of Research on Jute and Allied Fibre Technology	Kolkata	www.nirjaft.res.in

29	National Research Centre on Carmel	Bikaner (Rajasthan)	
30	National Research Centre on Coldwater Fisheries	Bhimtal	www.dcfr.res.in
31	Orissa University of Agricultural and Technology	Bhubaneswar (Odisha)	ouat.ac.in
32	Professor Jayashankar Telangana state Agricultural University	Hyderabad(Telengana)	www.pitsau.ac.in
33	Project Directorate on poultry	Hyderabad(Andhra Pradesh)	www.pdonpoultry.org
34	Tamilnadu Agricultural University	Coimbatore(Tamilnadu)	www.tnau.ac.in
35	University of Agricultural and Horticultural Sciences	Shimoga	uahs.in
36	University of Agricultural Sciences	Bangaloreu	www.uasbangalore.edu.in

8. Conclusion

The Institutional Repository collets, makes available, and preserves in digital format the scholarly output created by the institutions community. Its interface provides for easy self-archiving by faculty, and organizes the documents in logical, easily retrieved fashion. Open access publications have emerged as a new source of freely available research literature in digital format and thousands of these publications are available these days. The good part is that researchers can easily access these publications via Internet on their computers or smart phones. This is welcome news for agriculture researchers relying mainly on libraries to search research literature. Researchers must learn about and take benefit of Krishikosh Institutional Repository for improving their research outputs.

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Open Access Repositories Worldwide in the field of Business and Economics: *an Informative Study*

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Abstract: This paper describes the worldwide growth trends of Open Access Repositories in the field of Business and Economics using data collected by the Open DOAR project. The present study attempts to map the repositories by nature, continent, countries, and usage of repository software, the most common content type and languages covered by repositories in Open DOAR database. Open DOAR is an authoritative directory of academic open access repositories. The majority of the institutions worldwide have established repositories. Institutions encouraged their faculty, staff and research scholar to submit their publications in these repositories in order to make the research output of the institutions readily available , and also to provide a solution to the concerns of rising prices of scholarly communications and losing access to the key material due to cancellation of high cost journals in the libraries.

Keywords: Repositories, Open Access, Institutional Repositories, Open DOAR

1. Introduction

Today, knowledge is considered as a strategic resource. It is inevitable that we create, store, share and transfer information and knowledge in a continuous flow for the advancement of society. For more than a decade, academic institutions have struggled with how to manage the collective, digital intellectual output they produce. Clearly, due to technological advancement, it is easy to create and access digital material. Paradoxically, however, while there is potential for instantaneous access, all too often many materials are not usually made accessible to many users and they remain marooned in the authors' computers. Also, the escalating costs of electronic and/or print subscriptions from for-profit commercial publishers prohibit subscription and it is becoming increasingly unrealistic and challenging for libraries to subscribe to all, or even most of the online academic journals. There was thus a "scholarly communication crisis" owing to these high serial subscription costs and database licenses, which limited access to research outputs for university students and academics. This all prompted academic researchers and university and research centre administrators to come up with alternative forms of scholarly communication (Jain 125-6). 'Open Access' is a new movement in scholarly publishing. Open access journals provide free access to some or all of their research articles. In addition to open access journals, there are open archives and repositories (Lamb 143).This study is an attempt to identify the total number of Open Access Repositories worldwide and its publishing trends and growth over the years in the field of Business and Economics using one of the monitoring initiatives Open DOAR.

2. Objectives of the study

- To identify the nature of repositories worldwide;
- To find out the top ten countries in terms of number of repositories;
- To study the usage of repository software worldwide;
- To identify the type of content covered by the repositories;
- To ascertain the most frequent languages of repositories;
- To study the growth of Business and Economics repositories in Open DOAR database.

3. Scope and Limitation

Access to data and timely completion are the two vital factors for the success and accomplishment of the objectives of any investigation. Hence, considering the vast range of literature from every subject field and the limited time span to complete the research, the present study is limited to investigate the growth trend of open access repositories in the field of Business and Economics worldwide using Directory of Open Access Repository (Open DOAR) during the month of February, 2016. This is mainly an informative study based on the available information with Open DOAR.

4. Methodology

To gather data for the present study, repositories in the field of Business and economics worldwide were located using data collected by the Open DOAR project. Once the 235 Open Access Repositories in the field of Business and Economics were identified, they were analyzed using quantitative techniques and findings were presented in tabular form. One of the very important and first steps in this study was review of the literature which helped in knowing sources similar in terms of methodologies, philosophies, claims, choice and interpretation of evidence, reliability, etc. There are two initiatives that monitor the existence of repositories worldwide. One of the initiatives is Open DOAR (Directory of Open Access Repository) hosted by the University of Nottingham in UK which made their services public in December 2005 is used for this study.

5. Data Analysis and Interpretation

- **Open Access Repositories**

Table 1: Types of Open Access Repository in Business and Economics, February, 2016

S.No.	Type	Frequency	Percentage
1	Institutional	205	87.23
2	Disciplinary	15	6.38
3	Aggregating	9	3.83
4	Governmental	6	2.56

The Open DOAR database lists all the repositories worldwide records dramatic growth of overall 3037 open access repositories. 235 repositories are recorded in the field of Business and Economics at global level during the month of February 2016. With regard to repository type, majority of repositories are institutional (205) of the total (235) followed by Disciplinary repositories (6.38%), Aggregating repositories (3.83%) and Governmental repositories (2.56%) of the total repositories. The result depicts that Most of the repositories (87%) are institutionally focused covering the business and economics subject along with the other subjects as well. It also shows that Institutions are encouraging their researchers and staff to submit their full text publications in repositories which provide a solution to the concerns of rising prices of scholarly communications.

- **Geographic Distribution**

Table 2 shows the total number of repositories by continent in Business and Economics. Data in table shows that Europe has 111 the largest number of repositories of total 235 repositories at global level followed by Asia (20.85%), North America (13.62%), South America (8.51%), Africa (7.23%), Australasia (1.70%) and (0.85%) other continents.

Table 2: Repositories by Continent - worldwide, Business and Economics

S.No.	Continent	No. of Repositories	Percentage
1	Europe	111	47.23
2	Asia	49	20.85
3	North America	32	13.62
4	South America	20	8.51
5	Africa	17	7.23
6	Australasia	4	1.70
7	Other	2	0.85

Table 3: Top Ten Countries in terms of Repositories, Business and Economics

S.No.	Country	No. of Repositories	Percentage
1	United States	29	12.34
2	Germany	18	7.66
3	United Kingdom	15	6.38
4	France	12	5.11
5	Indonesia	10	4.26
6	Ukraine	10	4.26
7	Japan	9	3.83
8	Korea	9	3.83
9	Belarus	7	2.98
10	Italy	7	2.98
11.	Other	109	46.37

The result depicts that maximum number (47.23%) repositories are of Europe. It has been observed that Asian continent has also (49) good number of repositories of total

235 repositories at global level in Business and Economics which shows that researchers at all levels are encouraged to publish their research output in Open Access publishing.

- **Repositories by Country**

Table 3 shows that growth of repositories in the top ten countries on the basis of number of repositories reveals that United States has the highest number (29) of repositories worldwide followed by Germany (7.66%), United Kingdom (6.38%), France (5.11%), Indonesia and Ukraine (4.26%), Japan and Korea (3.83%). Overall 12.34% of the total repositories covering Business and Economics are from United States. It is observed that Asian developing countries are also in the ranking of the top ten countries in term of number of repositories i.e. Indonesia with 10 repositories followed by Ukraine.

- **Repository Software**

Table 4: Usage of Repositories Software

S.No.	Software	No. of Repository	Percentage
1	Dspace	115	48.94
2	E-Prints	38	16.17
3	Unknown	16	6.81
4	Digital Commons	14	5.96
5	OPUS	8	3.40
6	Greenstone	7	2.98
7	HAL	6	2.55
8	Other	31	13.19

There are a number of open-source software packages available for repositories include D space, E-Prints, OPUS, and Greenstone etc. There are also proprietary software services available. Table-4 shows that majority (115) of the repositories worldwide from 235 total repositories are using D space open source platform for managing their institutional repositories followed by E – Prints (16.17%), Unknown (6.81%), OPUS (3.40%), Greenstone (2.98%). It also reveals that (5.96%) repositories are using proprietary software i.e. Digital Commons and Other (13.19%) institutions are using locally/In – house developed software for managing resources.

- **Content Type**

Journal article is a written published work in a print or electronic form.Table-5 shows that the most common content type in all repositories listed in OpenDOAR is Journal articles. 168 out of 235 repositories are covering Journal articles followed by Theses and dissertations (64.68%), Unpublished reports and working papers (45.11%), Conference and workshop papers (39.15%), Books, chapters and sections (37.45%), Learning objects (17.87%) and other content type is also covered in OpenDOAR in different format i.e.

Multimedia and audio-visual material, biographical references, datasets, Patents, Software etc. which supports the scholarly communication.

Table 5: Repositories' Content Type

S.No.	Content Type	No. of Repository	Percentage
1	Journal articles	168	71.49
2	Theses and dissertations	152	64.68
3	Unpublished reports and working papers	106	45.11
4	Conference and workshop papers	92	39.15
5	Books, chapters and sections	88	37.45
6	Learning objects	42	17.87
7	Multimedia and audio-visual material	38	16.17
8	Biographic references	32	13.62
9	Other special item types	26	11.06
10	Datasets	7	2.98
11	Patents	7	2.98
12	Software	1	0.43

- **Language wise Distribution**

Table 6 Most Common Languages in Open DOAR – Business and Economics

S.No.	Language	Frequency	Percentage
1	English	167	71.06
2	German	27	11.49
3	Spanish	27	11.49
4	French	24	10.21
5	Russian	13	5.53
6	Korean	11	4.68
7	Ukrainian	10	4.26
8	Japanese	8	3.40
9	Chinese	7	2.98
10	Indonesian	7	2.98
11	Italian	7	2.98
12	Portuguese	6	2.55
13	Arabic	5	2.13
14	Dutch	4	1.70
15	Norwegian	4	1.70
16	Polish	3	1.28
17	Finnish	2	0.85

It is very important to know the language in which scholarly communications are being published in Open DOAR in the field of Business and Economics. Table-6 shows that English is the most common language used in 167 repositories of the total 235 repositories. There are also other common language material covered by the repositories i.e. German

(11.49%), Spanish (11.49%), French (10.21%), Russian (5.53), Korean (4.68%), Ukrainian (4.26), Japanese (3.40%).

- **Growth of Repositories in Open DOAR**

Table-7: Overall Growth of Open DOAR Database – Worldwide, Business and Economics

S.No.	Year	No. of Repositories	Percentage
1	2005	11	4.68
2	2006	61	25.96
3	2007	67	28.51
4	2008	75	31.91
5	2009	87	37.02
6	2010	88	37.45
7	2011	118	50.21
8	2012	154	65.53
9	2013	200	85.11
10	2014	216	91.91
11	2015	233	99.15
12	2016	235 (Feb.1, 2016)	100

Table 7 shows that the total number of repositories grew from 11 in December, 2005 to 235 February, 2016 in the field of Business and Economics, worldwide. It also reveals that there was good growth of repositories numbers in the initial years as it grew from 11 to 61and slowing down from 2008 to 2010 and then again showed rapid growth in final years from 2012 onwards. At present the result depicts that 235 repositories are listed in OpenDOAR in Business and Economics, worldwide.

- **Status of Repositories in OpenDOAR**

Overall, the total number of repositories recorded in OpenDOAR in the field of Business and Economics is 235. The result depicts (Table 8) that 95% of repositories identified are fully operational, other (3.40%) on trial mode only and (1.28%) having broken operation. The results show that good numbers (95.33%) of repositories areprovidedwith the resources (financial and competent human resource) from the institution forits establishment and proper maintenance.

Table 8: Open Access Repositories Status - Worldwide, Business and Economics

S.No.	Status	No. of Repositories	Percentage
1	Operational	224	95.32
2	Trial	8	3.40
3	Broken	3	1.28

- **Ranking of Repositories**

Table 9: Top Ten Repositories in the field of Business and Economics, Worldwide

S.No.	Repository Name	Country	Item Count
1.	Research Papers in Economics	United States	2000000
2.	Hyper Article enLigne	France	1095980
3.	USC Digital Library	United States	408609
4.	EconStor	Germany	100446
5.	AgEcon Search	United States	95018
6.	Hyper Article enLigne - Sciences de l'Homme et de la Société	France	90921
7.	University of Nairobi Digital Repository	Kenya	77791
8.	Korea Institute of International Economic Policy Repository	Korea, Republic of	71739
9.	Queensland University of Technology ePrints Archive	Australia	66544
10.	Publicatt	Italy	47815

Table 9 shows that the top ten repositories in the field of Business and Economics, worldwide with item count. Data in table 9 reveals that three repositories are from United States and two from France. Research Papers in Economics is at the top in the field of Business and Economics worldwide with 2000000 items followed by Hyper Article enLigne (France) with 1095980 items and USC Digital Library is at the third place with 408609 items.

6. Summary of Findings and Recommendations

- Most of the repositories (87%) are institutionally focused covering the business and economics subject along with the other subjects as well. It also shows that Institutions are encouraging their researchers and staff to submit their full text publications in repositories.
- Maximum number (47.23%) repositories are of Europe. It has been observed that Asian continent has also (49) good number of repositories of total 235 repositories at global level in Business and Economics which shows that researchers in developing countries are also more into Open Access publishing.

- United States is at the top having the highest number (12.34%) of repositories worldwide followed by Germany (7.66%), United Kingdom (6.38%), France (5.11%), Indonesia and Ukraine (4.26%). It is observed that Asian developing countries i.e. Indonesia and Ukraine with (4.26%) repositories are also ranked in top ten countries in term of number of repositories, worldwide.
- D space Open Source Software is being used by the majority (48.94%) of the repositories worldwide followed by E - Prints (16.17%). Proprietary software is being used by (5.96%) repositories i.e. Digital Commons and Other (13.19%) repositories are using locally/In - house developed software for managing the content.
- The most common (71.49%) content type in all repositories listed in Open DOAR is Journal articles followed by Theses and dissertations (64.68%), unpublished reports and working papers (45.11%).
- English is the most common language used in 167 repositories of the total 235 repositories. There are also other common language material covered by the repositories i.e. German (11.49%), Spanish (11.49%), French (10.21%), Russian (5.53), Korean (4.68%), Ukrainian (4.26), Japanese (3.40%). It is observed that material in other languages is gradually increasing.
- At present, 235 repositories are listed in OpenDOAR in Business and Economics, worldwide. Total number of 11 repositories in December, 2005 grew to 235 repositories in February, 2016.
- 95% of the total repositories identified are fully operational, with most of other (3.40%) on trial mode only and (1.28%) having broken operation.
- This study covers the trends and growth of Open Access repositories listed in OpenDOARin the field of Business and Economics. Other subject areas may be covered in order to understand their scholarly publishing trends and along with covering the qualitative aspects.

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THE CONCEPT OF CRISIS MANAGEMENT IN ELECTRONIC ENVIRONMENT IN LIBRARIES

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Abstract

The present paper explores the crisis and its management in general in libraries. There are many crisis in libraries as financial, operational, staff, technological etc. The present paper describes the steps of crisis management in libraries. Here crisis is not natural disaster, author describe here only man made crisis and its management. Author also suggests some remedies and preventive measure of crisis in libraries as formation crisis team, training, user's feedback, ICT application, Open source (Automation Software, digitations software and e-resources) are the some important methods for crisis management in libraries.

Key-Words: Financial Crisis, Technological Crisis, Staff Crisis, Crisis Management, Disaster Management, Predict Crisis, ICT, Open Source

1. Introduction

Library is a social institution and it has a major role to play in the intellectual development of every individual in the society to enlighten their citizenship. These enlightened individuals in the society have to play a vital role in nation building and community development. Those communities perished from the mankind map may not avail the fruit of

education. Library is the vertebral column of education system, without this the structure of intellectuals cannot stand. A sound education system always needs a very sound information system in the form of Libraries, documentation centers etc. Because library is the base kitchen from where various intellectual recipe is served in various forms of literature like books, journals, newspapers, magazines, non-book materials, audio-visual aids and modern electronic gadgets etc.

Crisis may any situation that is threatening or could threaten to harm people or property, seriously interrupt business, significantly damage reputation and/or negatively impact the bottom line[1]. Crisis means for many people disaster and disaster may natural (like earthquake, sunami and heavy rain, floods, cyclone etc) and manmade disaster (fire, short-circuit, breakages, crash of HDD server etc). Here manmade crisis is discussed only as general word of crisis is used for many troubles by the people in many senses. Even those have shortage of time say that there is a 'crisis of time'.

Libraries are non- profit organization and every year it required a huge amount to run its activities, this create financial crisis in libraries and shortage of staff is staff crisis, fear of learning of new technology is technological crisis. Now user's expectations in internet age are increasing day by day and to satisfy these expectations of users is crisis of satisfaction. There are many type of crisis in libraries and these crises may be management by new technology and with some preventive measure. The advent of new technologies and their application to LIS work and services, computer are now being used for the processing, consolidating and repackaging of information in a big way to satisfy the users of libraries.

2. Crisis in Libraries

A crisis is the process by which an organization deals with any major unpredictable event that threatens to harm the organization, its stakeholders, or the general public. Three

[1] http://www.bernsteincrisismanagement.com/the-10-steps-of-crisis-communications/

elements are common to most definitions of crisis: (a) a threat to the organization, (b) the element of surprise, and (c) a short decision time[2]. Crisis word is used in much sense by the people on many platforms' if they face any acute problem or trouble.

Presently every library manager is facing this crisis in their library in the electronic environment. Every library professional knows that basic tasks in library management include the planning of acquisitions (which materials the library should acquire, by purchase or otherwise), library classification of acquired materials, preservation of materials (especially rare and fragile archival materials such as manuscripts), accessioning of materials, patron borrowing of materials, and developing and administering library computer systems. More long-term issues include the planning of the construction of new libraries or extensions to existing ones, and the development and implementation of outreach services and reading-enhancement services (such as adult literacy and children's programming), but beyond these management & operation works, many time libraries faces many challenges such as staff problems, technology problems. Now we may say these problems in many libraries as follow:

- Crises of staff,
- Crises of finance
- ICT infrastructure Crisis
- Crises of technology experts,
- Crises of user expectations in new environment,
- Workloads crises on library personnel etc.

Potential crises are enormous, but we may find crisis in Library as Technical breakdowns (hardware & software failure, electrical failure etc.), Human breakdowns (suddenly lake of skilled manpower) Challenges (Advance technology literacy), Organizational (financial crisis, library materials crisis) Workplace violence (user's dissatisfaction, crowed of circulation) Rumors (negative publicity of library services). Crisis may be a big loss to any organization/company/factory/service institution in sudden time.

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[2] Seeger, M. W.; Sellnow, T. L.; Ulmer, R. R. (1998). "Communication, organization and crisis". Communication Yearbook **21**: 231–275.

3. Crisis Management

During the crisis management process, it is important to identify types of crises in that different crises necessitate the use of different crisis management strategies. The basic steps of effective crisis management are not difficult, but they require advance work in order to minimize damage. Some main process, solution and remedies of crisis are as follow:

3.1. Formation of Crisis Management Team

Library should make a small team of senior professionals should be identified to serve as your library's Crisis Team. This team may also co-opt any expert members from other faculties. This team should monitor library system periodically and also coup on new trends of ICT.

3.2 Predict Crises

This is the best preventive measure of crisis as library should prepare list of possibilities of crises. In libraries we may make list of such crises as user's pressure on examination days, new books for new opening courses, future demand of users in ICT age and different expenditure of futures, these are some example, there may be more crises depend on the nature of library. Library should begin to think about possible responses, about best-case/worst-case scenarios.

3.3. Training

Library should organizing workshop training program on the topic and library personnel should send to other developed libraries for the purpose. These types of training and workshop will help in control on crises management in libraries. Crisis of technological expert may be solved by training the concerned staff.

3.4. Identify and Know Your Users

This is basic thing that we should know who are the internal and external readers that matter to our library. Users are our important audience, because feedback of every user plays an important role in building best library. Today KYC (Know Your Customer) is the trend in every organization but in library customer need, requirement and background of the users is very important column in this KYC. Time to time library should take user survey for improvement in the library.

3.5. Review the Crisis Situation

Library Crisis Management Team should review the situation of actual crisis. Library should seek the reason behind the crisis. Library should extract the reasons of failure of crisis management so in the future the situation may not repeat.

3.6. After-Crisis Analysis

After crisis library crisis team should examine in details the reason behind crisis and to ensure that this type of crisis should not be repeated in future. Every working person in library should have the all type of knowledge. A formal analysis of what was done right, what was done wrong, what could be done better next time and how to improve various elements of crisis attentiveness is another must-do activity for any Crisis Management Team.

3.7. ICT application

Information Communication Technology plays an important role to overcome many problems and troubles of libraries. Libraries should apply ICT in its operations and services to satisfy their users in this electronic era. In internet age, internet itself a big library and to survive in this internet age, best efforts should be adopted by the libraries.

3.8. Open Sources: A Magic

Now many libraries are facing the problems of funds to purchase even library automation software and e-resources for their users. Now many open source software like newgenlib, koha, evergreen and OpenBiblio etc are available for computerization process of libraries and dspace, greenstone and e-prints etc are available for creating digital library.

Now many e- resources like e-journals, eBooks and databases are freely available for academic use. Library may create their homepage with inclusion of site of these open e-resources. DOAJ is an online directory that indexes and provides access to quality *open access*, peer-reviewed *journals*.

This open source magic may overcomes many crises of libraries and manage these in effectively way.

4. Conclusion

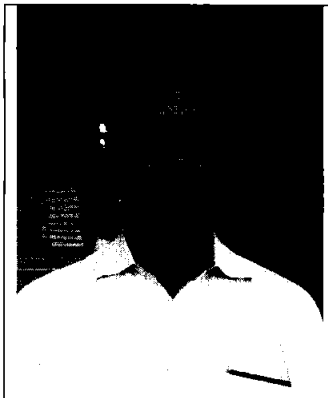
The situation demands that are the libraries are not keeping pace with the information explosion, infrastructure & technology they cannot help the users. Major elements of effective

management planning include the identification of a crisis management team, an assessment of the most likely crisis scenarios, the development of a crisis management plan document, periodic crisis training exercises, adherence to crisis communication guidelines and continual review and refinement of the plan.[3] Many crises in libraries are lack of funds, staff, ICT infrastructure and skilled staff etc. but these crises should be managed by managing authority of libraries by supporting the libraries. Library manager also try to motivate their staff by rewarding/promotion system and training and workshop on crisis management should be organized in library or staff may be sent to other place for the purpose.

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Use of Institutional Repository for Information Dissemination and Knowledge Management

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Abstract: The paper is a case study which gives a summary of the experience in disseminating information through an institutional repository at the Automotive Research Association of India, Pune. The paper has proven to cover different aspects of Knowledge Management (KM) and discusses more about Institutional Repository in Knowledge Management perspective. In this paper we emphasize the need for deploying and share our experience in creating a state-of-art Institutional Repository using the DSpace software. The method of developing the IR, which includes, the installation, defining the communities and collections, content development and management are illustrated. The paper also illustrates the library services and mode of information dissemination to its users by engaging with knowledge management. It also discusses the proposed initiative of incorporating the library database from LibSys and linking the e-Modules from Learning Management System (LMS) to the institutional repository for the benefit of user community at ARAI.

Keywords: Institutional Repository (IR), Knowledge Management, Dissemination of Information, Library Services.

1. Introduction

Knowledge Management (KM) has been promoted as a valuable business concept for almost two decades. Although originally emerging in the world of business, the practice of knowledge management has now spread to the domain of non-profit and public sector organizations, including that of libraries. Stephen Abram writing in an LIS context observed that knowledge can be shared but cannot be managed: In fact capturing knowledge in any form other than into a human being's brain reduces it to mere information, or worse, data. Only the knowledge environment can be managed (Abram, 1997). This has been reflected in the following definition of KM from an LIS perspective: The creation and subsequent management of an environment which encourages knowledge to be created, shared, learnt, enhanced, organized and utilized for the benefit of the organization and its customers (Abell & Oxbrow, 2001). Knowledge Management is a combination of people, process and technology. This involves people from a wide variety of disciplines including, for example, Information Technology (IT), Engineering, LIS and Human Resource Management (HRM).

This paper attempts to present the role of an institutional repository, engaging with knowledge management and also attempts to overview the need for deploying and sharing experience in creating a state-of-art Institutional Repository using the DSpace software from the librarians' perspective, towards the effective integration of knowledge as best practices in the daily organizational domain & business processes.

2. Profile of Automotive Research Association of India:

The Automotive Research Association of India (ARAI) established in 1966 as a Co-operative Industrial Research Centre by the Automotive Industry and Government of India. It has grown substantially to become a Prime Research, Development and Testing Institute in India, bringing complete automotive technology under one roof. It works in harmony and complete confidence with its members, customers and the Government of India to offer the finest services, which earned for itself ISO 9001, ISO 14001, OHSAS 18001 and NABL accreditations. ARAI is well-equipped with state-of-the-art infra-structural facilities and highly qualified manpower. ARAI has entered into Golden Jubilee Year. To mark this significant milestone, we are celebrating Golden Jubilee of ARAI from 10 December 2015 to 10 December 2016.

3. ARAI (Knowledge Centre) Library

Knowledge Centre which supports learning and is basically a portal of library assisting students, faculty & professionals to gather knowledge in automotive engineering domain, set up in the year 1975, is a fully automated special library and is one of the finest libraries in India having specific collection in automotive and related subjects. The primary goal is to cater to all types of information needs of in-house researchers. The Knowledge Centre also serves professionals in the field of automotive engineering, students, professionals, faculty and various government organizations from Automotive and allied subjects. In 2011, Knowledge Centre (KC) was renovated to enhance seating capacity for referring & reading. KC also provides free access to all SAE members in India. The renovation undertaken has greatly improved its environment, comfort and safety &security by addition of centralized A.C. system, fire alarm system and Digital Video Recorder (DVR) system.

Its vision is to cater to the information / knowledge needs of its users by providing value-added and user focused services, it also contributes to the fulfillment of the mission by:

- Selecting, Acquiring, Organizing, Maintaining & providing access to a collection of resources that will support research & development, testing and educational activities.
- Publishing monthly periodical "Automotive Abstracts", a monthly survey of automotive and related technical literature.
- Responding to the needs of the internal / external members/customers.

- Providing users induction, personal assistance in conducting literature research & other reference services.
- Enhance library resources, staff and services through training and up gradation.
- **Digital Preservation:** Digitization includes acquiring, converting, storing and keeping information in a standardized and organized way with technological support. Depending on the physical status of the documents available in library were being skimmed in the resolution of 300 to 600 dpi (dot per inch). Scanned pictures were then being stored in the computer in PDF (for text) and JPEG (images) formats. The aim of the digitization is 1) To Preserve the Original Documents in Digital Format. 2) To Improve Library Services. 3) To Improve Qualitative and Quantitative Resource Sharing. 4) To Provide Right Information to the Right user within Minimum Time.
- **Hardware & Software:** Knowledge Centre procured and arranged one rack mount IBM Server (x3550 M4) with EMC VNXE3150; 2XSP DPE; 8GB; 12X3.5; 6X3 TB NL-NAS storage system (see figure 1&2 below) for installing DSpace software and to preserve the digitized documents. DSpace is open source software and also have enhanced features as compared to any other digital library software. It is most ordinarily used by special libraries to set-up an institutional repository. That is why ARAI Knowledge Centre has opted DSpace to digitize its special collections.
- **Installation of D Space:** Library has taken assistance from INFLIBNET Center to install DSpace software. The completion of installation was done by INFLIBNET team and have successfully installed DSpace 5.2 version on Windows platform in the provided IBM Server. We customized the DSpace as it has an inbuilt feature for customization and administration. The below figure 3 presents the homepage of the institutional repository.

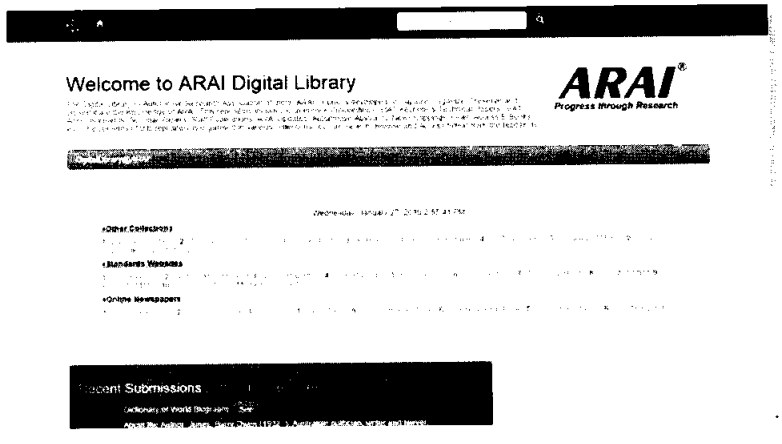


Figure 1: ARAI Digital Library – Home Page

- **Homepage Customization:** The look and feel of the repository has been customized considerably, as compared to the default installation of the DSpace software. Figure 3 is the screen shot of DigitalLibrary@ARAI homepage. The home page shows the total count of items it holds in eachcollection and community; it also shows the links to other resources like, SAE Digital Library, WebOPAC, Standards Websites, Newspapers, etc.

4. Institutional Repository in Knowledge Management Perspective:

Nowadays, the academic society are more aware on the importance of knowledge and ways to acquire, recognize, capture, retrieve, use or measure, manage and share the knowledge in the form of knowledge artifacts. The term Knowledge Management is created for resemble the process involve in managing the knowledge. The key concepts of knowledge management could be used to help understanding towards the formation of successful Institutional Repository.

The development of internet technology has brought more enlightens in the field of research and learning. Especially in the field of education, the idea of institutional repositories holds a key role to be played ever. Institutional repositories are service provider that research organization offers to its community for the management and dissemination of research materials created by the community members and also currently used by leading academic and research institutions worldwide for providing improved access to their research publications. Institutional Repositories acts as storing and disseminating in house treasure of knowledge in which includes explicit and tacit knowledge. The Digital Library (Institutional Repository) is developed to Capture, Organize, Preserve and disseminate the research publications. It includes Conference Proceedings, SIAT Announcements for Reference, SIAT Keynote Papers, SIAT Technical Papers, Seminar Papers, and Technical Papers Published by Employees, ARAI Updates, Automotive Abstracts, and News Related to ARAI, Open Access Books, and PGA Students theses and also includes other publications. It is created using DSpace open source software. The repository can be is accessed only within Campus (Intranet). This explicit knowledge is used by employee to refine & incorporate best practices in daily project work, fostering standardization. ARAI library collected both primary as well as secondary resources, covering the broad subject areas of research in automotive engineering and allied subjects as well as highly advanced areas in Automotive Industry. The following special collections are preserved in the Institutional Repository for dissemination of information and knowledge management:

- **ARAI Updates (Tacit to Explicit (Externalization)):** ARAI Updates covers the articles basically on projects completed, innovations, ideas generated, patents, trademarks, facilities established in ARAI, etc. It is a bi-monthly publication, started in the year 2006. The collection in the IR has been created according to the year wise and uploaded the scanned copies. There are total 76 items in this collection, contain 105 subject keywords.

From this collection of information, the users can have an idea to generate the new projects in automotive and new product introduction, product development, engineering services information to the stakeholders.

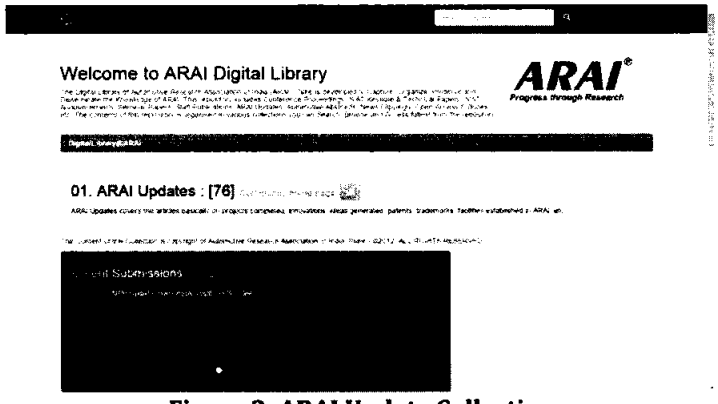


Figure 2: ARAI Update Collection

- **Automotive Abstracts (ARAI Magazine) (Explicit to Explicit (Combination)):** Automotive Abstracts (ISSN No. 0970-7115) printed and published monthly by Knowledge Centre since 1975. Abstracts of articles published in most of the leading Journals/Periodicals on automotive technology and International Symposium such as IMechE, FISITA, ISATA, SIAT, etc. This publication has been published for providing updates on the latest events and happenings in the automotive industry and the patent applications being filed in this regard. It also includes Auto news, Techno scan, IPR scans, etc. The collection in the IR has been created according to the year wise and uploaded the scanned copies. There are total 188 items in this collection, contain 96 subject keywords. From this collection of information, the users can have search of literature of their interest for their projects and also have document delivery of technical articles for their research and education purpose.

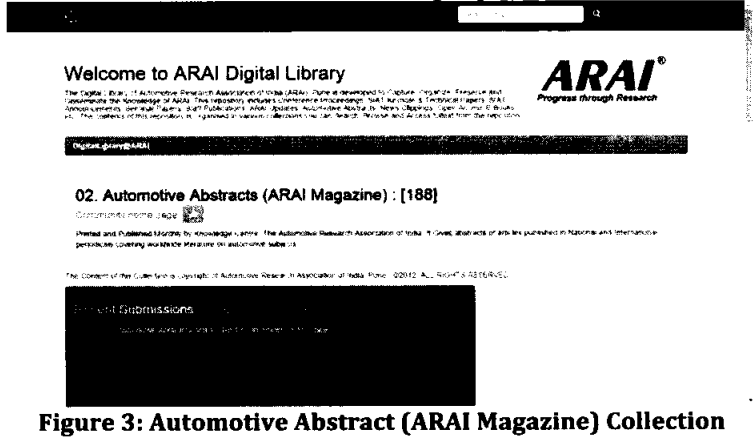


Figure 3: Automotive Abstract (ARAI Magazine) Collection

- **ARAI Seminars & Conferences (Tacit to Explicit (Externalization))**: The documents includes of Events, Workshops, Seminars and Conferences & Programmes conducted by ARAI. The collection in the IR has been created according to the Seminar / Conference wise and uploaded the scanned copies. There are total 237 items in this collection, contain 296 subject keywords. From this collection of information, the users can have reference of literature for their projects, new ideas for their research and education purpose.

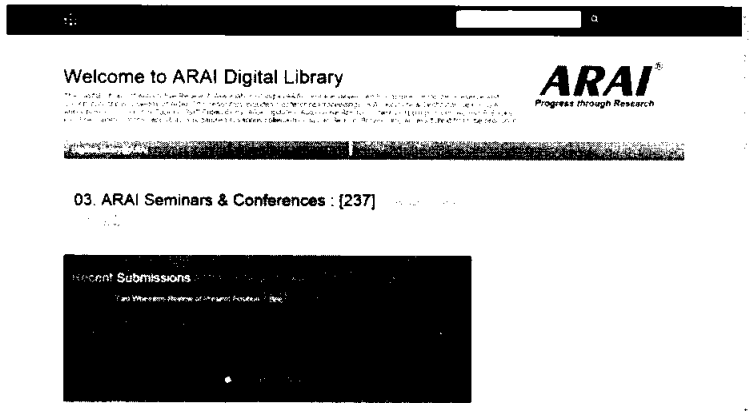


Figure 4: ARAI Seminars & Conferences Collection

- **Departmental Brochures (Tacit to Explicit (Externalization))**: The department brochure is a publication that defines the programmes of a specific department or area and is designed specifically for their customers. The brochure highlights the research areas and new initiatives in the department. The collection in the IR has been created according to the department wise and uploaded the scanned copies. There are total 12 items in this collection, contain 40 subject keywords. From this collection of information, the users can have an opportunity to go into more detail about a particular department, its successes and key reasons. It also give department branding to the stakeholders.

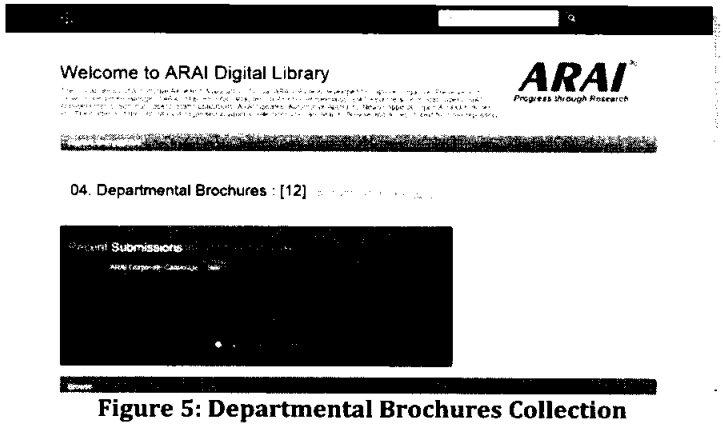


Figure 5: Departmental Brochures Collection

- **Staff Publications (Tacit to Explicit (Externalization))**: A number of ARAI staff regularly publishes their papers in conferences & seminars. The papers in these collections are a list of their publications since 1992. The collection in the IR has been created and uploaded the papers according to author wise. There are total 57 items in this collection, contain 106 subject keywords. From this collection of information, the users can have reference and identifies a gap in their research projects.

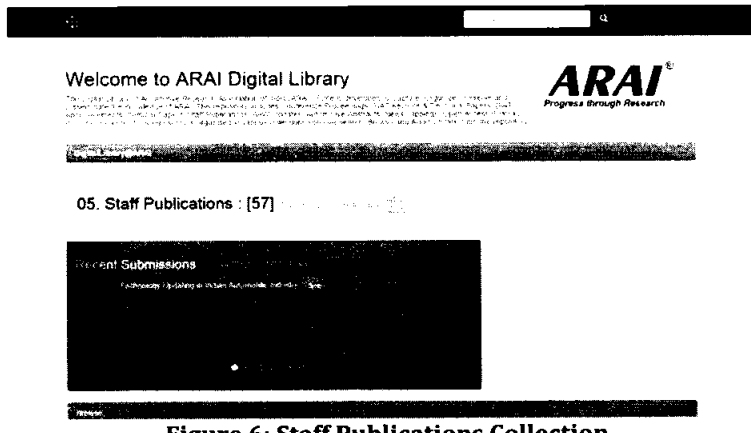


Figure 6: Staff Publications Collection

- **E-Books (Explicit to Explicit (Combination))**: An eBook is an electronic version of a traditional print book that can be read by using a personal computer or by using an eBook reader (Search Mobile Computing, 2016). Knowledge Centre has perceptually procured some of eBooks from the publishers to keep in Institutional Repository. It also downloads eBooks from Open Access Publishers for the benefit of user community. The collection in the IR has been created according to the publisher wise and uploaded the eBooks. There are total 133 items in this collection, contain 498 subject keywords. From this collection of information, the users can have reference and identifies a gap within literature for their projects and get new ideas for their research and education purpose.

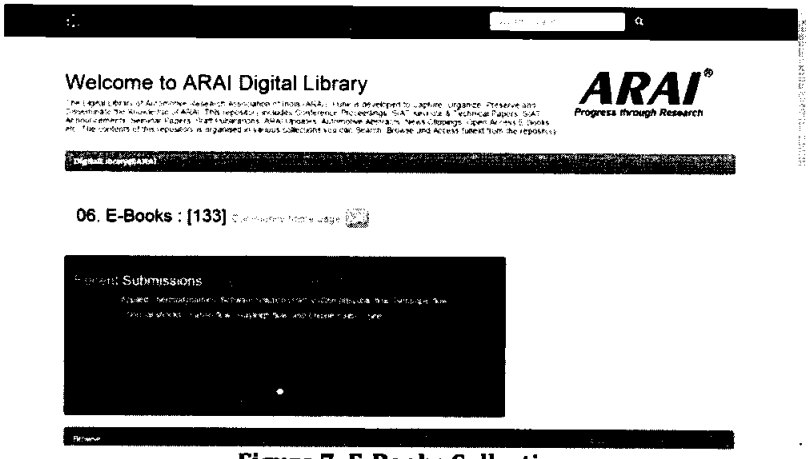


Figure 7: E-Books Collection

- **ARAI in News (Explicit to Explicit (Combination))**: The newspaper clippings published in various newspapers about or on the institution is collaged and kept for future reference. The collection in the IR has been created according to the Newspaper wise and uploaded in the IR. There are total 56 news clippings contain 102 subject keywords. From this collection of information, the users can have ideas on the events that happened in the institution, create interest from the new technology reports, etc.

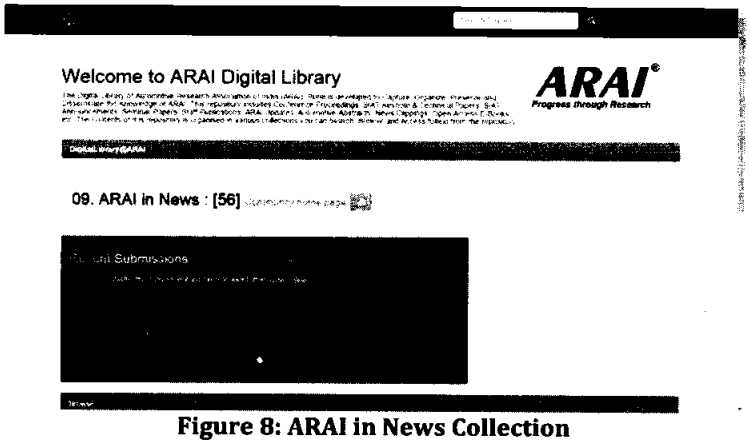


Figure 8: ARAI in News Collection

- **SIAT Proceedings (Tacit to Explicit (Externalization)):** Symposium on International Automotive Technology (SIAT) is an event organized by ARAI biennially. SIAT serves as an important forum for exchange of ideas and brainstorming for the automotive industry. Over the years, the event has grown in stature and is now considered as a prestigious automotive event marked by presence of global automotive fraternities. This community has divided into four sub-communities. Each sub-community has the collection in the IR has been created according to the publication wise and uploaded the technical papers, keynote papers, technical bulletin papers, etc. There are total 1276

items in this community, contain 1489 subject keywords. From this collection of information, the users can have reference of literature for their projects, new ideas for their research and education purpose.

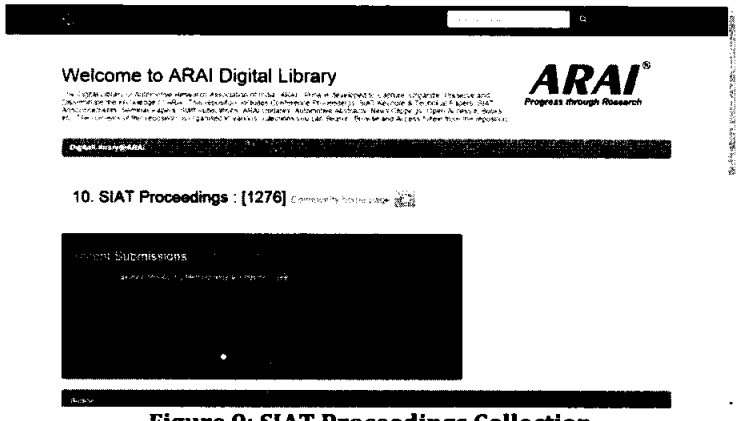


Figure 9: SIAT Proceedings Collection

- **Project Reports (Tacit to Explicit (Externalization)):** ARAI has embarked upon a programme of building up human resources by commencing educational programmes (B. Tech, M. Tech, & Ph.D.) with specialization in Automotive Engineering. It has tied up with VIT University (Vellore), VEL TECH University (Chennai), College of Engineering (Pune), University of Alabama (USA), Tennessee Tech University (USA), Loughborough University (UK) and Braunschweig University (Germany). This community has divided into two sub-communities. Each sub-community has the collections in the IR has been created according to the course / batch wise and uploaded the project reports. There are total 510 items in this community, contain 1289 subject keywords. From this collection, the users can lay down various objectives in their projects, and successfully implement and conduct their research.

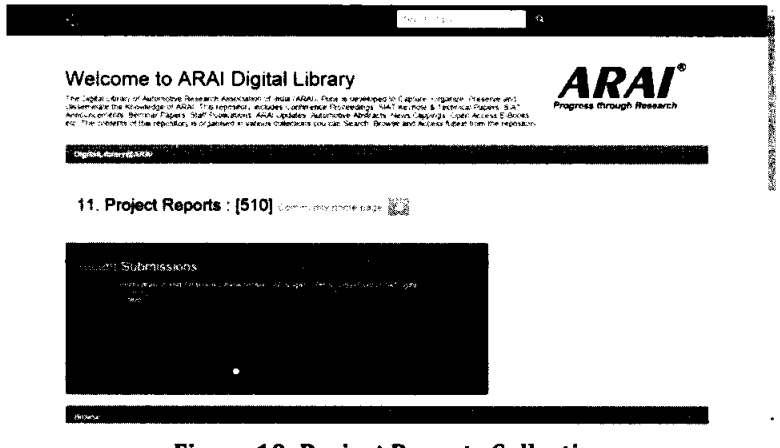


Figure 10: Project Reports Collection

4. Other Resources

Apart from the above special collections in the institutional repository, ARAI library also developed their resources access and sharing strategies from printed to electronic and digital resources.

- **Online Public Access Catalogue (Explicit to Tacit (Internalization)):**The Library Catalogue can be used to find all print and electronic collections in the Library. An online public access catalog (often abbreviated as OPAC) is an online database of materials held by a library or group of libraries. Users search a library catalog principally to locate books and other material available in the library. In the year 1996 the Knowledge Centre was automated with LibSys System, the database is kept open to the public for search and locates the items like books, CDs, Standards etc. for issues. The OPAC can be access by public from the following link http://203.124.138.37:8080/webopac/html/SearchForm. These are referred to by ARAI employees in daily project lifecycle to create tools / data / knowledge banks.
- **Digital News (Auto News)(Explicit to Explicit (Combination)):** Knowledge Centre provides the latest news related to automotive field searching from various online newspapers in India and collecting them all to one source and making all the news articles in an interactive method and post to all staff by email. It also archives in a SharePoint portal (intranet) which is a web-based, full-text access to news items using web interface. These are referred by ARAI HoDs for business prospects etc.
- **E-book Readers ((Explicit to Explicit (Combination), (Tacit to Explicit (Externalization)):** An e-book reader, also called an e-book device or e-reader, is a mobile electronic device that is designed primarily for the purpose of reading digital e-books and periodicals. Any device that can display text on a screen may act as an e-book reader, but specialized e-book reader designs may optimize portability, readability (especially in sunlight), and battery life for this purpose. A single e-book reader is capable of holding the digital equivalent of hundreds of printed texts with no added bulk or measurable mass. Knowledge Centre purchased two E-book readers to provide mobile reading facility to executives for easy to carry and convenient to read books during travelling. These are referred by employees' onsite / vacation / on travel to enhance knowledge.
- **Proficiency Improvement Programme Proceedings(PIPs) ((Tacit to Explicit (Externalization), (Explicit to Explicit (Combination)):** In line with Graduate, Post Graduate and Doctoral Programs conducted by various universities abroad, ARAI Academy has devised various Proficiency Improvement Programmes (PIPs), to be taught by ARAI, academia & industry experts. PIP gives engineers, faculty and students' knowledge and technical expertise in a wide range of automotive disciplines. It helps in understanding system's view point for automotive design and manufacture, with specific skills in formulating automotive engineering solutions in terms of their function and performance, through optional modules.

- **SAE Digital Library (Explicit to Explicit (Combination), (Explicit to Tacit)):** An online database is a database accessible from a network, including from the Internet. Knowledge Centre subscribed to online database like BIS standards (client based) and SAE Digital Library (Online), Bureau of Indian Standards (BIS) is a client based system which is accessed only through Intranet. SAE Digital Library is an online database includes SAE technical papers published by SAE International. This explicit knowledge is used by ARAI employees to draft test procedures / SOPs for homologation / R&D activities.

5. Knowledge Dissemination

Knowledge dissemination is an integral part of organizational life. It represents the dissemination of knowledge (conveying the knowledge of one source to another source) and the appropriate use of the dissemination knowledge. The goal is to promote/facilitate knowledge sharing, collaborating and networking. It can involve assessing valuable/ scarce resources, new expertise; new insight, cross fertilization of knowledge and can create an organizational environment of excellence. Collaboration implies the ability to connect diverse assets into unique capabilities in pursuit of new opportunities mainly for organizational growth. Knowledge dissemination can be done by working together, communicating, learning by doing, using face-to-face discussion, or embedding knowledge through procedures, mentoring, or documents exchange. Knowledge can be disseminated from repositories to people, from team(s) to individual(s), and between individuals. The ARAI KM library system is developed to integrate knowledge dissemination into daily work, making life easy for employees.

6. Further Plan

According to our plan we have procured 1 IBM Server with 15 Terabytes of NAS Storage system and installed DSpace 5.2 version and have created a communities and collections according to the available data. It is an ongoing system therefore up till now only digitized documents have been uploaded and it will continue. Now our proposed further plan is to bring the students, engineers, faculty, and experts' community on a single platform by changing from traditional learning methods to e-learning methods by creating e-modules and integrate them into institutional repository from Learning Management Software (LMS). And migrate library automation (LibSys) data into institutional repository, so that the user can make a search at single source of information. Through this proposal we will be providing access to information and the e-learning along with sound and images in a single source of learning which will become more interesting and innovative as well.

7. Conclusion

In the business world, knowledge management has been regarded as strategically important for organizations to gain a competitive advantage over their competitors, to add value to their products, and to win greater satisfaction from their customers. In the library world, there is a lesson to be learned from the business world. Knowledge management is

as important for libraries as for the businesses minus the competitive, proprietary, and moneymaking concerns. In fact, libraries have had a long and rich experience in the management of information. Many of such knowledge and skills of librarianship can be applied to knowledge management. Through integrating KM principles into library management, effective knowledge dissemination has been ensured to stakeholders. Through developing KM system, learning curve reduced, knowledge added to organization, employees' life is easy. Further research is to map the architecture of KM system to suit the ideal formation of IR system.

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Author's Profile

A. Madhava Rao is Working as an Executive (Technical Information Officer) for Automotive Research Association of India, Pune. Before joining ARAI, he worked 5 years as a Librarian for Nizam Institute of Engineering and Technology, Hyderabad and developed library Automation software named LASAL (Library Automation Software in Academic Libraries) using Open Source tools. He also worked as a Team Leader with National Information Services Corporation (NISC) affiliated to Baltimore, USA an E-Publishing company for 7 years and was preparing Author & Institutional profiles for EBSCO databases. Attended 28 Conferences / Seminars and published more than 20 national and international papers in the field of Library & information Science and received 4 best paper and presenter awards.

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A Research Study on Bibliometric Analysis of the Indian Journal of Marketing - 2011-2015

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Abstract: In this electronic era there is awareness of the advantages of quantitative evaluation. The science is concerned that bibliometric indicators are must for evaluation of document, file or any text. In this paper authors begin with a brief history of bibliometric and followed by trace its origins and define its role in the evaluation of articles. We shall present a variety of bibliometric indicators, noting their uses and their limitations. The aim of this study is to highlight both the strengths and weaknesses of bibliometric indicators.

Keywords: Bibliometric, Citation Analysis, Authorship, Citation

1. Introduction

The Bibliometric is a research method mostly used in library and information science and is a quantitative study of various aspects of literature on a topic. It is used to identify the pattern of publication, authorship and the secondary journal coverage to gain insight into the dynamics of growth of knowledge in the areas under the consideration. Pritchard coined a new term "bibliometrics" in 1969. Bibliometrics was defined as the application of mathematical and statistical methods to books and journal articles. Bibliometrics has a specific measurements and indicators and purpose is to measure the output of scientific and technological research through data. Bibliometric techniques have evolved over time and are continuing to do so the counting of papers with attribution by geographical area, by institution and by author. The counting of citations, to measure the impact of published work on the scientific community; the counting of co-citations; the number of times that two papers are cited together in a single paper etc. All these techniques combine to give more detailed and more effective measurements and the results are presented in various forms, like that mapping, in order to depict the relationships between participants and expand the means for analysis of documents.

Dr. S.R. Ranganathan, library science scientist coined the term "librametry" in 1948. It is historically appeared first and was intended to streamline the services of librarianship. Bibliometrics is equivalent to Ranganathan's librametrics; the Russian concept scientometrics; infometrics; webometrics and subdisciplines like econometrics; psychometrics; sociometrics; biometrics; technometrics; chemometrics; and climetrics; where mathematics and statistics are applied to study and solve problems in their respective fields. Scientometrics is used for the application of quantitative methods to the history of science and overlaps with bibliometrics to a considerable extent.

2. The Need to Evaluate Research

The periodicals are the indicators of literature growth in the field of knowledge and it is emerge as the main trace for transmit knowledge. Because of to the escalating cost of the periodicals and lack of adequate library budgets the selection of any particular periodical for a library should be done more carefully. That's why the library authorities are forced to reduce the number of periodical subscriptions. Bibliometric analysis has huge applications in the LIS filed in identifying the research trends in the subject, core journals, etc. so that the frame new subscription policies develop for day before. These studies will be helpful for librarians to plan a better collection development in their library.

3. Indian Journal of Marketing: in Brief

The Journal "INDIAN JOURNAL OF MARKETING" (ISSN 0973-8703) is a double blind peer reviewed refereed monthly journal, it was started in 1968. It is the very oldest and the only monthly journal of Marketing in the India. It is an authentic for research publication dealing with Marketing; Advertising; Consumer Behaviour; Sales Management; Advertising & Promotion Management; Business Education; Business Information Systems (MIS); Business Law; Communication; Direct Marketing; Global Business; Health Care Administration; Marketing Research; Marketing Theory & Applications; Office Administration/Management; Organizational Development; Production/Operations; Public Administration; Retailing; Sales/Selling; Services; Tourism, Hospitality and Leisure; and Industrial Organization.

4. Need for the Study

The Periodicals are the indicators of literature growth in any field of the knowledge. They emerge as the main channel for transmitting knowledge. Because of the escalating cost of the periodicals and lack of decent library budgets, the selection of any journal for a library should be done properly. Now a day the Library authorities are forced to reduce the number of journal subscriptions. Bibliometric analysis has relevance in library and information science in determine research trends, core journals, etc., and so that framing subscription policies for tomorrow. This study will be helpful for librarians for the collection development for their library.

5. Objectives of the Study

- To analysis of articles published from 2011-2015 only for the "Indian Journal of Marketing"
- To identify the number of contributions in published articles.
- To determine the year-wise distribution of articles in that particular journal only.
- To study the authorship pattern
- To study the subject coverage of articles in that journal.

- To study the length of articles of particular journal.

6. Methodology

The methodology applied in the present study is bibliometric analysis that is used to study in detail the bibliographic features of the particular journal articles and citation analysis of the references at the end of each article published in "Indian Journal of Marketing" from 2011-2015. For this the relevant data are collected and recorded in separate file. Then they are tabulated and analysed for making observations for the bibliometric research study.

7. Analysis and Interpretation of Data

The analysis was done in two parts

1) Analysis of articles and 2) Analysis of citations.

Article Analysis: All the details such as author(s), title, year of publication and pagination etc., of all articles published from 2011 to 2015 were recorded for the following analysis.

Number of Articles: A total number of 390 articles published during the period 2011-2015 and has been recorded for the present study.

Table1: Year-wise Distribution of Articles

Year	Vol.No.	of Issues	No. of Articles	%age
2011	40	12	91	23.34
2012	41	12	93	23.85
2013	42	12	81	20.76
2014	43	12	70	17.94
2015	44	12	55	14.11
Total	60	390	100.00	

The table-1 shows the maximum number of articles published in 2012 (93) and minimum in 2015 (55) articles. The journal publishes on an average of 78 articles per year.

- **Subject Distribution of Articles:**

Table 2: Subject Distribution of Articles

Subject	No. of Articles	%age
Consumer Behavior	140	35.90
Branding	105	26.92
Online Marketing	45	11.53
Retailing	30	7.70
Rural Marketing	25	6.41
Marketing Strategies	20	5.12
Others	25	6.42
Total	**390**	**100.00**

Table 2 above shows that a majority of a contributions appeared under Consumer Behavior 140 (35.90%) and on branding shows 105 (26.92%). After that position is taken by Online marketing 45 (11.53%), Retailing 30 (7.70%), Rural Marketing 25 (6.41%), Marketing Strategies 20 (5.12%), Other subjects of marketing 25 (6.42%).

- **Authorship Pattern:**

Table 3: Authorship pattern

Year	No. of Authors				Total
	1	2	3	4	
2011	40	42	7		89
2012	45	39	5	1	90
2013	39	35	7		81
2014	25	41	7	1	74
2015	11	29	12	3	55
Total	160	186	38	5	389
%age	41.14	47.82	9.76	1.28	100

Table 3 reveals the authorship pattern of the articles published during the period of this study. The largest number of articles had two authors 186 (47.82%). This is followed by single author 160 (41.14%), three authors 38 (9.76%) and four authors with 5 (1.28%) of the total articles.

- **Year-wise Authorship Pattern:**

Table 4: Year-wise Authorship pattern

Authorship	Year					Total	%age
	2011	2012	2013	2014	2015		
Single	40	45	39	25	11	160	41.13
Joint	49	46	40	49	45	229	58.87
Total	89	91	79	74	56	389	100.00

The above table-4 shows that out of 390 articles single authors contributed 160 (41.13%) while the rest 229 (58.57%) articles were contributed by joint authors.

- **Institution-wise Contribution:**

Table-5 Institution-wise Contribution of Articles

Name of Institute	No. of Articles	%age
Universities	93	33.34
Colleges	63	22.58
Business School	84	30.11
Research Institute	27	9.67
Companies	12	4.30
Total	**279**	**100.00**

A majority of the articles 93 (33.34%) were contributed by Universities. This is followed by Business school with 84 (30.11%) and colleges 63 (22.58%) articles and research institute 27 (9.67%). The remaining 12 (4.30%) articles were contributed by Companies.

- **Length of Articles:**

Table-6 Length of Articles

	Authorship					YearTotal%age
	2011	2012	2013	2014	2015	
5-10	18	25	23	30	28	12431.79
11-15	25	30	26	32	28	14136.15
16-20	20	35	29	21	20	12532.06
Total	63	80	78	83	76	390100.00

Above table shows that the majority articles 141 (36.15%) have the length of 11-15 pages followed by 125 (32.06%) articles with the 16-20 pages and remaining 124 (31.79%) articles with (5-10) page.

Citation Analysis:

In the citation analysis the references provided by the authors at the end of their article and it are basis of citation analysis method. The Citation traces a connection between two documents, in that the one which cites and another which is cited. The Citation analysis is one of the popular methods for the citation and it is applied to derive the following aspects:

- **Referencing Characteristics:**

Articles with and without references are accounted as follows:

Table-7 Articles and references

Category	No. of Articles	%age
Without reference	390	100.00
Total	390	100.00

All the articles have references 390 (100.00 %).

- **Forms of Documents Cited:**

Distribution of various forms of cited documents are given in the following table. They include journals, books, reference books, dissertations, conference proceedings, seminars etc.

Table-8 Forms of documents cited

Forms of Documents	Total No. of Citations	%age
Journals	275	40.44
Books	80	11.76
Proceedings	180	26.47
Websites	145	21.33
Total	680	100.00

A maximum authors are preferred journals as the source of information for their research articles and that all are occupied the top position with the highest number of

citations 275 (40.44%) of the total 680 citations followed that position is occupied by proceedings with 180 (26.47%) citations, 145 (21.33%) articles shows websites as a references and least 80 (1.76%) articles shows books citations.

8. Major Findings:

From the above research here author find some findings and which are as below:

- Here find that the researchers are now a day not writes much more article. The researchers are interested to upload their articles on internet as an open source.
- In this "Indian Journal of Marketing" maximum articles are shows in the Consumer Behavior subjects.
- From this study here find that the sharing base or joint author articles are very high compare to others.
- In the Institute-wise contributors the universities are maximum.
- In the length of articles the maximum articles are shows more than 11-15 pages.
- Mostly all the articles are shows high references.
- Maximum authors are used journals for the research articles and their research work also.

9. Conclusion

The journal "Indian Journal of Marketing" has a very long history of 47 years, from that this study examined for five (2011-2015). In this period the journal has tried to keep up its main aim of acting as communication of all users of management, marketing and research scholars and commerce students and faculties to update their subjective knowledge. This research study reveals that the highest articles have appeared in the area of consumer study and consumer behavior.

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An analysis of Library Collection: *a Case study of Dr. H.R.Gajwani College of Education*

Dharmishtha Dangar

Abstract: This study examines student teachers' satisfaction towards physical facilities, utilization of learning resources and services provided by the library. The findings revealed that majority of student-teachers were satisfied with library services. But, the availability of learning resources was not remarkable in their satisfaction level.

Keywords: library collection, collection analysis, library analysis

1. Introduction

The academic library is the nerve centre or the hub around which scholarship revolves. It is an indispensable instrument for intellectual development. A well stocked academic library is a store house of information, or a record of human experience to which users may turn to for data or information. According to Oxford Dictionary of Current English : "Library ... Collection of books, public or private ; room or building where these are kept; similar collection of films, records, computer routines, etc. or place where they are kept; series of books issued in similar bindings as set"

Our everyday life is changing rapidly due to the technological innovations in all fields. These new technological changes are affecting the field of library science and information just like any other field. It is shifting the role of traditional librarian like book keeper to a dynamic agent that collects information from different sources and makes it available and usable for their seeker. Librarians in 21st century are require to play multiple roles that demand the presence of various skills New era Librarians are required to understand the need to learn more about new technologies and be comfortable using them in order to perform their utmost role which is to organize the large amount of information and different resources in a way that is conveniently accessible to library users.

2. Purposes of Library in an Institution

- To provide access to information
- To provide database resources which supports the academic and research curriculum
- To Educate Information seeker in the identification and effective use of information resources
- To strengthen and update all collections as per the needs of the users

3. Dr. H.R.Gajwani College of Education: A Brief Profile

Dr. H.R.Gajwani College of Education is located in Adipur, kutch district Gujarat state. It was established in 2005, in the memory of Dr. H.R.Gajwani, an eminent eye surgeon of the twin towns Gandhidham/Adipur. It is recognized by the NCTE, Bhopal and affiliated to Krantiguru Shyamji Krishna Verma Kutch University Bhuj. It was accredited by NAAC in

2013 with 'B' Grade, 2.80 CGPA. The College, with a capacity for two units of students offers two years Teacher Education Programme. It is also a centre of Indian Institute of Teacher Education, Gandhinagar, offering M.A. in Education & Diploma courses in Educational Management & Guidance Counseling.

Dr. H.R.Gajwani College of Education library is situated in the centre of College building. Library is spread over 2,763 Sq. Feet. The library has a collection of over 4,000 volumes of books. In which books are there in 3 languages English, Hindi and Gujarati and 20 Journal titles. Library has a very wide Collection of different Atlas/Maps .This number is 70. The College Library is automated using Soul software for the library management.

4. Importance of Library for Student-Teachers

Library is a calm and tranquil atmosphere which has a special call to the students who go there and quench their thirst for reading the reference material which is useful for improving their knowledge. In library they find an environment which is conducive to the building up habit of self learning. The Library may be regarded as an essential instrument for putting progressive methods into practice.

5. Objectives of study

- To know the reasons for the use of the library by student-teachers
- To analyze the feedback collected about the library
- To measure the level of user satisfaction of available services
- To find out the difficulties faced by student-teachers

6. Analysis and Interpretation of Data:

- **Physical Facilities:** The data (Table-1) shows that 58 % of student-teachers have opined **seating arrangement** in the library was good, whereas only 1 % of student-teacher responded that seating arrangement was poor. For the **lighting** of library, 51% of student-teachers have responded that it was good. Regarding **peaceful environment** 40-41% of student-teachers responded good and excellent respectively. 55% of student-teachers responded that ventilation of library was good. Regarding arrangement of books 40-44% of student-teachers gave opinion good and excellent respectively.
- **Utilization of Facilities:** To attract towards utilization of library facilities, 52 % Student-teachers showed the utilization for borrow / return or renew library resources. Only 3 % students had shown their interest in utilization of journals and magazines. 30% of students-teachers were referring library for course of study. 15 % students were utilizing for other things. In response to frequency of using library, 30% of student-teacher responded that they use library daily, 47 % of them using library once in a week, 10% of student-teachers uses library once in a month, 13% of student-teachers responded that they use library during examination. Considering student-

teacher as a user of Dr. H. R. Gajwani's library, 24% consider themselves as a beginner. 36 % of student-teachers consider themselves as Intermediate. 26% of student-teachers consider themselves as fairly experienced user. 14 % of student-teachers consider their self as very experienced user.

Table 1: Physical Facilities in the Library (in percentage)

Particulars	Poor	Fair	Average	Good	Excellent
Seating Arrangement	1	4	30	58	7
Lights	1	4	10	51	34
Ventilation	0	1	24	55	20
Peaceful Environment	0	3	16	40	41
Arrangement of Books	1	3	12	40	44

- **Learning Resources:**

Table-2: Learning Resources (In Percentage)

Particulars	Poor	Fair	Average	Good	Excellent
Availability of Reference Books	0	4	23	46	37
Availability of e-resources	9	7	35	38	11
Variety of Reference Books	4	4	16	50	26
Accessibility of Reference Books	0	6	24	53	17
Classification of Reference Books	3	7	13	44	33

- **Services Provided By Library:** The data (**Table-3**) showed services provided by the library. It indicates that 58% of student-teachers gave their feedback that orientation class for the library was good. For the user friendly rules and regulations maximum no. of student-teachers responded on good and excellent. 60% of student-teachers were responded that database system of library was good. Maximum no. of student-teachers was satisfied with circulating the books of library. 50% of student-teachers responded that duration of library utilization was good. Maximum No. of student-teachers were satisfied with the no. of books issued to them. In the feedback of opinion duration of keeping books, 38% student-teachers responded well whereas, 4% of the student-teachers responded it poor. 40% of Student-teachers responded that upgrading with new reference material (New Arrival) was good. 62% of student-teachers responded that reprography service of college library was good.

Table 3: Services Provided By Library (in percentage)

Particulars	Poor	Fair	Average	Good	Excellent
Orientation class	0	1	18	58	23
User friendly Rules & Regulations of the Library	0	1	10	46	43
Database System	0	0	18	60	22
Circulating the books	0	1	10	50	39
Duration of Library utilizations	3	0	9	50	38
No. of Books issued	0	4	21	47	28
Duration for keeping Books	4	4	20	38	34
Online reissue of Books	4	7	27	53	9
Upgrading new reference Materials (New Arrivals)	0	6	26	40	28
Reprography Services	1	7	20	62	10

- **Utilization of Library learning resources:** The data reflects **(Table- 4)** utilization of Library learning resources. It indicates that 43% of student-teachers availed general books sometimes whereas 12% student-teachers responded that they could never get general books. 50% of student-teachers responded that they get specific subject related books for sometimes. Maximum No. of student-teachers responded that they never get periodicals and journals. 37% of student-teachers were responded that they never get conference papers. 40% of student-teachers responded that they never get encyclopedia and dictionaries whereas 13% student-teachers responded that they always get Encyclopedia and dictionaries. Maximum No. of student-teachers were responded that they never get Atlas/Maps whereas 26% student-teachers responded that they always get Atlas/Maps. Maximum No. of student-teachers responded that they always get student support materials and question banks.

Table 4: Utilization of Library learning resources (in percentage)

Type of Learning Resources	Always	Sometimes	Rarely	Never
General Books	30	43	15	12
Specific subject related Books	35	49	9	7
Text Books	50	29	18	3
News Papers	23	27	24	26
Journals & Periodicals	18	27	13	42
Conference Papers	7	29	27	37
Encyclopedias / Dictionaries	13	24	23	40
Atlas (Maps/ Charts)	26	16	24	44
Learning materials (Question Banks/ Student Support Materials)	48	26	13	13

7. Major Findings

- Maximum No. of student-teachers were issuing library books. Their reference to educational journals and periodicals were very much poor.
- Majority of Student-teachers were not visiting the library daily.
- Maximum No. of student-teachers were not considering themselves as an experienced user.
- Student-teachers were satisfied on the availability of physical facility of library. Approximately 50% of student-teachers responded that seating arrangement, Lights, Ventilation, Peaceful Environment and arrangement of books were good for them.
- Student-teachers opined that learning resources like availability of reference books, e-resources and accessibility of reference books were appropriate.
- The users of library services responded that services were good for them regarding orientation program, Rules & Regulations, database system, circulation system, duration of Library utilization, no. of Books issued, duration for keeping books, Online Re-issue of books, upgrading new reference materials and reprography services.

8. Suggestions

The following suggestions should be focused for making library service as effective one.

- Seating arrangement should be more comfortable as height of table is little much more than chairs
- For the peaceful environment library should have proper separate reading room so that student-teacher can concentrate on their reading.
- Display of books should be changed as it was stacked in height. Provision of stairs is necessary for effective display.
- Collection needs to be improved including reference collection, journals, Atlas and Maps.
- Circulating of books should be improved which can be replaced by bar-coded charging system.
- Duration of Library should be 8 Hours. It should extend one hour before and one hour after of college timings.
- Five number of books at a time should be issued to the user
- Awareness on Library services is to be developed.
- Continuous Education to the user should be given for the maximum utilization of library.

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Footprint and Imprint: *An Ecologic Time-trend Analysis of Cardiovascular Research - 1983 to 2014*

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Abstract: The paper focuses the growth pattern of Cardio Vascular literature during 1983-2014 (32 years). The PubMed database has been used to retrieve relevant data. The total number of publication has been identified as 1551881 records contributed worldwide over a period of1983-2014.The Literature were downloaded and classified chronologically. To investigate the nature and growth of articles, exponential, linear and logistic were tested. Linear treandR^2(0.9408),R^2Exponential trend (0.9834) and R^2 (0.8992).Finally it shows that, Relative growth rate is increasing trend.

Keywords: Cardiovascular; Growth rate analysis; Doubling Time; Linear trend; Exponential trend; Time-trend analysis.

1. Introduction

Cardiovascular disease (CVD) is a class of diseases that involve the heart or blood vessels cardiovascular disease includes coronary artery diseases such as angina and myocardial infarction,_commonly known as a heart attack (ShanthiMendis, 2011). Cardiovascular diseases remain the biggest cause of deaths worldwide. More than 17 million people died from CVDs in 2008. More than 3 million of these deaths happened before the age of 60 and could have largely been prevented. The percentage of premature deaths from CVDs ranges from 4% in high-income countries to 80% in low and Middle-income countries and by 2030 more than 23 million people will die annually from CVDs. leading to growing inequalities in the existence and outcome of CVDs between countries and populations (WHO, 2015).Scientific development is a continuous process attributed to theoretical and applied research conducted by scientists, academicians, professionals and researchers. They continuously strive for excellence in their research domain, by translating the research results as publications in discipline oriented communication channels at national and international level. Consequently, scientific productivity and its visibility enhance globally (Ashwani Kumar Mishra, 2013).

2. Time-trend analysis

The term Time-trend is frequently used in the various fields of discipline especially in population studies to indicate growth trend during a period of time. In the present study

the term trend analysis used to monitor the growth and pattern of cardiovascular research by applying mathematical and statistical techniques (Oed, 2004)

3. Objectives

- To determine the growth of cardiovascular literature by calculating relative growth rate and doubling time for publications.
- To suitable both modified exponential curve and linear curve for the original publications data studying actual growth pattern.

4. Database and Methodology

The Cardiovascular Literature retrieved from the PubMed database from the year 1983to 2014. The articles were classified chronologically and transported to spread sheet application and analysed the data as per objectives of the study. To investigate the nature and growth of articles, linear and exponential were tested. The exponential growth is define as

$F(t) = a\, b^{et}$

Where a = the initial size of literature i.e. at time t=o and b, the continuous growth rate is related to the percentage by which the size increases each year.

- **Relative Growth Rate (RGR)**

Relative Growth Rate (RGR) and Doubling Time (Do) had been applied. RGR means the increase in the number of articles per unit of time. The mean RGR of articles over the specific period of interval is represented as

R_{at} = Relative Growth Rate of articles over the specific period of time.

= Logarithm of initial number of articles

= Logarithm of final number of articles

Similarly, RGR of subject's articles has increased in number of articles per unit of time. The mean RGR of subject articles R_{at} (SA) over the period the specific period of time is determined as

R_{at} (SA) =

R_t (SA) = Relative Growth Rate of articles over the specific period of time.

= Logarithm of initial number of articles

= Logarithm of final number of articles

- **Doubling Time (D_t)**

D_t (Doubling Time) has been calculated using the following formula:

Doubling Time or $D_t = 0.693/R$

Table1: Relative growth-rate (RGR) and doubling time (Dt) of articles in Cardiovascular literature from 1983 to 2014

Year	No. of Articles	Cumulative No. of articles	$Log_e 1^P$	$Log_e 2^P$	R_t (P)	Mean R_t (P)	D_t (P)	Mean D_t (P)
1983	25975	25975	10.16	10.16	0.00		0.00	
1984	27188	53163	10.21	10.88	0.67		1.34	
1985	28433	81596	10.26	11.31	1.05		2.11	
1986	28731	110327	10.27	11.61	1.35		2.69	
1987	29577	139904	10.29	11.85	1.55		3.11	
1988	30471	170375	10.32	12.05	1.72		3.44	
1989	32712	203087	10.40	12.22	1.83		3.65	
1990	33693	236780	10.43	12.37	1.95	1.27	3.90	2.53
1991	34308	271088	10.44	12.51	2.07		4.13	
1992	34363	305451	10.44	12.63	2.18		4.37	
1993	35376	340827	10.47	12.74	2.27		4.53	
1994	35252	376079	10.47	12.84	2.37		4.73	
1995	36839	412918	10.51	12.93	2.42		4.83	
1996	37938	450856	10.54	13.02	2.48		4.95	
1997	39552	490408	10.59	13.10	2.52		5.04	
1998	41162	531570	10.63	13.18	2.56	2.36	5.12	4.71
1999	43486	575056	10.68	13.26	2.58		5.16	
2000	46076	621132	10.74	13.34	2.60		5.20	
2001	47858	668990	10.78	13.41	2.64		5.28	
2002	49613	718603	10.81	13.49	2.67		5.35	
2003	53991	772594	10.90	13.56	2.66		5.32	
2004	56321	828915	10.94	13.63	2.69		5.38	
2005	60270	889185	11.01	13.70	2.69		5.38	
2006	63244	952429	11.05	13.77	2.71	2.66	5.42	5.31
2007	65739	1018168	11.09	13.83	2.74		5.48	
2008	68374	1086542	11.13	13.90	2.77		5.53	
2009	71122	1157664	11.17	13.96	2.79		5.58	
2010	73230	1230894	11.20	14.02	2.82		5.64	
2011	75684	1306578	11.23	14.08	2.85		5.70	
2012	79746	1386324	11.29	14.14	2.86		5.71	
2013	85338	1471662	11.35	14.20	2.85		5.70	
2014	80219	1551881	11.29	14.25	2.96	2.83	5.92	5.66

D_t (Doubling Time) is directly related to RGR and is defined as the time required for the articles to become double of the existing amount. If the number of articles in subject doubles during a given period, then the difference between logarithms of number at the beginning and at the end of the period must be the logarithm of the number 2. We used Napier logarithm and the taken value of is 0.693. Hence, as per this (0.693) and an average

growth rate we calculated by what time interval does the Napier logarithm of numbers increase by 0.693. So the Doubling time is calculated as

$$D_t\,(SA) =$$

Here, D_t (SA) = average doubling time of subject articles (Mahapatra, 1985).
The study has been done only for the period 1983-2014 with aim to understand the growth of cardiovascularresearch literature. The analysis of the table 1 and figures1, 2 and 3 shows that growth rate for gradually increasing1.27in the first eight years (1983-1990),1.27 to 2.36 high productivity in the second eight years (1991-1998), continuously 2.36 to 2.66years (1999 to 2006) and finally increased from 2.66 to 2.82 in the last eight years that is (2007 to 2014).Cardiovascular health research output has increased substantially in the past decade, with a greater intention of eradicate the widespread disease. This may be due to involvement of cardiovascular researcher with a number of opportunities and challenges, including taking advantage of high-throughput technologies to expound complex disease mechanisms, accelerating development and implementation of evidence-based strategies, assessing evolving technologies of unclear value, addressing a global epidemic of cardiovascular disease, and maintaining high levels of innovation which reflect in the form of publications in highly reputed communication channels like journals.

Furthermore, mean Doubling time D_t[P] 2.53, for the first eight years (1983 to 1990)from 2.53to 4.71high productivity in the second eight years, i.e. from 1991 to 1998, it was 4.71 to 5.31 in the third eight years(1999 to 2006)and it increased to 5.66 in the last eight yearsi.e from 2007 to 2014. It shows that the mean relative growth of cardiovascularresearch literature has shown an increasing trend. The linear curve (fig.1) and exponential curve (fig.2) shows increasing trend as against data depicted in the table1. Therefore a research in the field of cardiovascular health has been increased from the last three decades.

5. Conclusion

Over the past 32 years, clinical research has become more global and more likely to be supported by medical industry. Clinical studies in general and cardiovascular health studies in specific have become larger and more complex which may have important ramification for cost of health care. The medical libraries may have a birds-eye-view on the research output to take decision for collection development and management. The study may helpful for the libraries for stock verification, rectification and space management.

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Author's Profile

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Information Flow in Political Science Research: *A Bibliometric Study of Doctoral Dissertations of Burdwan University, 2009-2014*

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Abstract: 1876 References appended to 13 Doctoral theses of political science submitted to the University of Burdwan are processed to analyse the data from different bibliographic aspects using the 'Biblio' software prepared by Bandyopadhyay. It is found that 61.52% of the total literature of political science is book and 20.76% are journal/news paper articles. EPW tops the ranked list of journals and two national newspapers comes next in ranking. Comparison of journal ranking is also made with the result of a user study of need assessment of the teachers and scholars of Political Science to find that there is match. While studying the age of references, it is found that the half life period of political science literature is nearly 12.4 years. It is further seen that over 90% of the references are single authored. In comparing the multiple authorship pattern with past study it is found that the multiple authorship trend has increased.

Keywords: Age of references, Authorship collaboration, Bibliometrics, Citation analysis, Half life period, Journal ranking, Multiple authorship, Political Science

1. Introduction

Reference or citation analysis is an accepted research tool of bibliometric study for identifying different characteristics of the documents used by the scholars of any discipline. The University of Burdwan is rural base state university of West Bengal. The Department of Political Science of the university is conducting M.A, M.Phil and Ph.D programmes. In this study we have made a bibliometric analysis of references used in the theses of Political Science submitted under the University of Burdwan during 2009-2014.

2. Literature study

Bandyopadhyay (1999) in his doctoral work "Bibliometric analysis of doctoral dissertations of the University of Burdwan..." analysed the references used in the Ph.D. theses of five different disciplines, including political science, from 1981 to 1990 submitted to the University of Burdwan. He prepared software for analysis of the references and got some interesting finding in analysis of the references of various subjects. Bandyopadhyay and Goswami (2001) made an user survey to study the information use pattern in political science research. Bandyopadhyay (2004) studied the authorship collaboration in physics, philosophy and political science to find that 63.30% of physics, 7.26% of philosophy and only 4.08% of the articles in political science are multiple authored. Thoidingjam (2004) made "Citation analysis of the Ph. D theses in social sciences accepted by Gauhati University

during 1970-1980" . Rani (2014) in "Citation analysis of management doctoral dissertations submitted to the University of Haryana, Punjab and Himachal Pradesh" has analysed total 28,928 citations from 210 doctoral dissertations. It is shown that journals were highly cited 43.33% as compared to books 31.58%. Jessy (1997) in "Information needs, use pattern and use behavior of social scientist: analytical approach through citation method" has analyzed average reference per thesis of political science. He has seen 62.29% book references and 15.86% journal references in political science. Stewart (1970) in "The literature in politics" has discussed on the citation analysis of political science.

3. Objective of the Study

- To analyze the bibliographic forms of literature used by the research workers of political science.
- To determine the ranked list of journals used in Political Science research.
- To analyze the age of the reference used.
- To study the pattern of authorship collaboration in Political Science.

4. Scope of the study

Thirteen doctoral thesis of Political Science submitted to the University of Burdwan during 2009-2014 are taken as the source for the study. There are 1874 references appended to these theses.

5. Methodology

Necessary information of all the thesis and the references appended to them have been collected at first on 5"3' cards then input of all these information are given into computer in a database with 9 fields as given below and these are processed to analyse the data from different bibliographic aspects using the 'Biblio' software prepared by Bandyopadhyay (2003).

5.1 Structure of the database

Field	**Field name**	**Type**	**Width**
1	REFCODE	C	5
2	REFTP	C	2
3	REFYR	N	4
4	NOREFRAUTH	N	2
5	JLNAME	C	20
6	SELFCIT	N	1
7	THYR	N	4
8	CITNO	N	4
9	REFAGE	N	3

A five character alpha-numeric code number (REFCODE) is allotted to each thesis of Political Science. The other fields used for recording are document type (REFTP), year (REFYR), number of author (NOREFRAUTH), name of the journal in case of a journal reference(JLNAME), and self-citation, if any(SELFCIT), source thesis year (THYR), citation number(CITNO), age of reference(REFAGE).

6. Analysis of the Data

- **Type of Documents used**

Types of bibliographic forms of documents used are given in table no.1 and Fig.1. It is found that 61.52% of the total literature of political science accounted for printed books, 20.76% for printed journals, 8.27% for reports, 3.63% for personal interview and 1.60% for conferences papers.

Table 1: Type of Documents Used in References of Political Science

FORM	NO. OF CITATION	PERCENTAGE
Books	1153	61.52
Journals	389	20.76
Reports	155	8.27
Conference/Seminar	30	1.60
Thesis	8	0.43
Unpublished	14	0.75
Acts	1	0.05
Others	40	2.13
Online Book	15	0.80
Online Journal	1	0.05
Personal Interview	68	3.63
Total	**1874**	100.00

- **Ranked List of Journals Used**

From table no.2 we get a list of 110 journals with last rank position 43. It is found that 'Economic and Political Weekly' (EPW) tops the list with 88 citations covering over 22% of total journal references. Next comes two News papers namely The Hindu and 'The Statesman'. First 9 journals cover over 51% of total journal references. However 29

journals are required to cover 75% of total journal requirements of political science scholars.

Table No.2: Ranked List of Journals Used by the Political Science Scholars

Sl No.	Rank No.	Journal Name	Cit. No.	Cumul.No.	Percent	Cumul. %
1.	1	EPW	88	88	22.62	22.62
2.	2	THE HINDU	24	112	6.17	28.79
3.	3	THE STATESMAN	19	131	4.88	33.67
4.	4	SOUTH ASIA POLITICS	14	145	3.60	37.27
5.	4	THE HINDUSTAN TIMES	14	159	3.60	40.87
6.	6	THE TIMES OF INDIA	13	172	3.34	44.21
7.	7	THE TELEGRAPH	10	182	2.57	46.78
8.	8	IJPA	9	191	2.31	49.09
9.	10	MAINSTREAM	9	200	2.31	51.40
10.	10	HARIJAN	8	208	2.06	53.46
11.	12	ELECTION MANIFESTO	8	216	2.06	55.52
12.	12	NA WAJIBAN	7	223	1.80	57.32
13.	14	INDIAN EXPRESS	7	230	1.80	59.12
14.	14	ANANDABAZAR PATRIKA	5	235	1.29	60.41
15.	14	YOJANA	5	240	1.29	61.70
16.	14	ASIAN SURVEY	5	245	1.29	62.99
17.	14	NEW YORK TIMES	5	250	1.29	64.28
18.	18	ADMINISTRATIVE CHANG	4	254	1.03	65.31
19.	18	AAJKAL	4	258	1.03	66.34
20.	18	FRONTLINE	4	262	1.03	67.37
21.	18	YOUND INDIA	4	266	1.03	68.40
22.	18	KURUKSHETRA	4	270	1.03	69.43
23.	18	INDIA TODAY	4	274	1.03	70.46
24.	18	IND J POLIT SCI	4	278	1.03	71.49
25.	25	ARMS CENTRAL TODAY	3	281	0.77	72.26
26.	25	ADMINISTRATOR	3	284	0.77	73.03
27.	25	WALL STREET J	3	287	0.77	73.80
28.	25	PEOPLE DEMOCRACY	3	290	0.77	74.57
29.	25	CURRENT HISTORY	3	293	0.77	75.34
30.	25	THE ECONOMIC TIMES	3	296	0.77	76.11
31.	25	J CUL DYNAMICS	3	299	0.77	76.88
32.	32	J SOC CHANGE DEV	2	301	0.51	77.39
.						
42	32	OUTLOOK	2	321	0.51	82.49
43	43	J CONTEM ASIA	1	322	0.26	82.75
.						
.						
110	43	J POLIT SCI	1	389	0.26	100.17

Interestingly in comparing the present ranked list of journals with a previous user study conducted among the teachers and research scholars of political science, it is found from table no.3 that EPW was first in rank and The Statesman was second in rank of their weighted list of most needed journals/newspapers. No less than ten journals of the present ranked list up to rank number 18 are also present in the user study within rank 20.

Table 3: Comparison of Rank No. of Journals Common in Present Study and in User Study of Political Science Scholars (Bandyopadhyay, A K and Goswami, N P (2001)

Sl No	Rank No. (as in present study)	Journal Name	Rank no. in User Study (table no-6 of ref.[2])
1	1	EPW	1
2	3	THE STATESMAN	2
3	7	THE TELEGRAPH	14
4	8	IJPA	14
5	8	MAINSTREAM	9
6	14	ANANDABAZAR PATRIKA	3
7	14	ASIAN SURVEY	14
8	18	IND J POLIT SCI	3
9	18	INDIA TODAY	18
10	18	AAJKAL	20

6.3 Age of References

In studying the age of literature, the references without date are first excluded. There are 1855 references with date of publication. To get the age of a reference, the year of publication of the reference is subtracted from the year of submission of the citing thesis. Table No.4 gives the age distribution in five year blocks like 0-4, 5-9, 10-14, 15-19 etc. It is found that in the first group of 0-4 years' of age falls only 13.58% of total references but if we go back up to 9 years it covers over 36% of references. Twenty five percent of the references in political science are over 25 years old.

Table 4: Age of References Used in Political Science Theses

Age	Citations	Total Citations	Percentage %	Cumulative
0 - 4	252	252	13.58	13.58
5 - 9	419	671	22.59	36.17
10-14	361	1032	19.46	55.63
15-19	194	1226	10.46	66.09
20-24	157	1383	8.46	74.56
25-29	105	1488	5.66	80.22
30-34	81	1569	4.37	84.58
35-39	58	1627	3.13	87.71
40-44	60	1687	3.23	90.94
45-49	53	1740	2.86	93.80
50-54	28	1768	1.51	95.31
55-59	18	1786	0.97	96.28
60-64	26	1812	1.40	97.68
65-69	14	1826	0.75	98.44
70	4	1830	0.22	98.65
75-7	6	1836	0.32	98.98
80-84	3	1839	0.16	99.14
85-89	4	1843	0.22	99.35
90-94	8	1851	0.43	99.78
95-99	0	1851	00	99.78
100+	4	1855	0.22	100.00

Table 5: Year Wise Distribution of Reference Age

Ref age	Cit no	Cumul. no.	Percentage	Cumul. %
0	1	1	0.05	0.05
1	37	38	1.99	2.04
2	64	102	3.45	5.49
3	71	173	3.83	9.32
4	76	249	4.10	13.42
5	79	328	4.26	17.68
6	125	453	6.74	24.42
7	70	523	3.77	28.19
8	87	610	4.69	32.88
9	58	668	3.13	36.01
10	79	747	4.26	40.27
11	70	817	3.77	44.04
12	75	892	4.04	48.08
13	85	977	4.58	52.66
14	52	1029	2.80	55.46
15	38	1067	2.05	57.51
16	36	1103	1.94	59.45
17	48	1151	2.59	62.04
18	40	1191	2.16	64.20
19	32	1223	1.73	65.93
20	39	1262	2.10	68.03
21	47	1309	2.53	70.56
22	30	1339	1.62	72.18
23	19	1358	1.02	73.20
24	22	1380	1.19	74.39
25	20	1400	1.08	75.47
26	16	1416	0.86	76.33
27	21	1437	1.13	77.46
28	29	1466	1.56	79.02
29	19	1485	1.02	80.04
30	16	1501	0.86	80.90
31	12	1513	0.65	81.55
32	17	1530	0.92	82.47
33	18	1548	0.97	83.44
34	18	1566	0.97	84.41
35	14	1580	0.75	85.16
36	9	1589	0.49	85.65
37	17	1606	0.92	86.57
38	10	1616	0.54	87.11
39	8	1624	0.43	87.54
40	12	1636	0.65	88.19

41	14	1650	0.75	88.94
42	14	1664	0.75	89.69
43	7	1671	0.38	90.07
.				
.				
177	1	1855	0.05	99.95

From table no. 5 we can see the year wise distribution of age of references used in political science. It is found that the Half life period of political science literature is nearly 12.4. To cover 90% of the total literature we need to go up to 43 years and 177 years can cover the whole literature.

- **Multiple Authorship Characteristics**

From table no.6 it is found that 90.18% of the total literature are single authored. 8.57% are double authored. But only 1.14% articles are triple authored and 0.11% of the total literature covered by five authored.

Table 6: Authorship Characteristics of the References

No. of Authors % (per article)	No of Citations	Total Citations	Percentage	Cumulative
1	1663	1663	90.18	90.18
2	158	1821	8.57	98.75
3	21	1842	1.14	99.89
4	0	1842	0.00	99.89
5	2	1844	0.11	100.00

Table 7: Comparison of Authorship Pattern of References Used in Theses of Political Science Submitted During 1981-1990 and 2009-2014

Authors per article	References used in these of 2009-2014	References used in these of 1981-1990
1	90.18	95.92
2	8.57	3.40
3	1.14	0.60
4	0	0.04
5	0.11	0.04

As shown in table no.7, from a previous study (Bandyopadhyay 2004) of references of Political Science theses submitted to the University between 1981 to 1990 it was found that 95.92% of those references were single authored and only 4.08% were multiple authored compared to 9.82% of multiple authored references of the present study. Thus the multiple authorship has increased to a considerable extent.

7. Conclusion

Books and monograph form the main source of information for political science research (61.52%) Journals and Newspapers comes next with 20.76% of references. EPW tops the list of ranked list of journals covering 22.6% of Journal literature. First 9 journals cover over 51% of total journal references. No less than ten journals of the present ranked list up to rank number 18 are also present within rank 20 of a previous user study conducted among the scholars of political science. Half life period of the references is found to be nearly 12.5 years. It is found that over 90% of the total literature covered are single authored while only 8.57% of the total literature covered are double authored. Comparing with some previous study it is found that multiple authorship trend has increased.

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Author's Profile



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Research on Annals of Library and Information Studies, 2011-2014: *A Bibliometric Study*

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Abstract: The present study contains a bibliometric analysis of articles published in the journal 'Annals of Library and Information Studies'. The study covers 135 articles from four volumes (58 – 61) published during the year 2011 to 2014. The study includes year wise distribution of contributions in the Journals. Authorship Pattern, Geographical distribution of contribution, prolific contributors in the journal, state wise distribution in India and as well as country wise distribution of the contributions across the world, year wise citation of distribution of contributions, bibliographical form of document cited, highly cited article, etc.

Keywords: Bibliometric, Citation Analysis, ALIS

1. Introduction

The term bibliometric was coined by Alan Pritchard, O V in a paper published in 1969, titled "Statistical Bibliography or bibliometric?" "Biblio" means book and "metric" means a scale or measure.He defined the term as "The application of mathematics and statistical methods to books and other media of communication". Bibliometric is statistical analysis of written publications, such as books or articles. Bibliometric methods are frequently used in the field of library and information science. Bibliometric is the statistical analysis of bibliographic data, commonly focusing on citation analysis of research outputs and publications, i.e. how many times research outputs and publications are being cited. Bibliometric analysis is becoming an increasingly important way to measure and assess research impact of individuals, groups of individuals or institutions. This paper studies the bibliometric analysis of article published in the Annals of Library and Information Studies from the year 2011 to 2014.

2. Annals of Library and Information Studies

Annals of library and information studies is leading quarterly journal in Library and Information Science published by National Institute of Science Communication and Information Resources (NISCAIR). The Journal is a medium for publishing original contributions, survey reports, reviews, short communications, and letters pertaining to library science.

3. Objective of the Study

The present studies analyze the publication trends in Annals of Library and Information studies during the period 2011 to 2014. The main objectives of the study are as follow.

- To find out the volume wise Contribution
- To know the year wise Authorship Pattern of contributors
- To know the geographical distribution of the contributors
- To study the length of the article
- To prepared a rank list of contributors
- To identify the highly cited paper
- To know the year wise distribution of citation
- To identify the bibliographical form of document cited

4. Methodology

For the analysis of the study, total Four volumes (58 to 61) containing 16 issues of Annals of library and information studies published during the year 2011 to 2014 have been taken for the study. The data was collected, analyzed and organized in the MS Excel. The collected data have been representing in the table and graphs. The citation analysis can be made by using Google scholar (https://scholar.google.co.in/).

5. Scope and Limitation

The present study includes only volume No. 58 to 61, (2011 to 2014) of Annals of Library and Information studies. Area of research is limited for four volumes. It is not include the other volumes of Annals of Library and Information studies.

6. Data Analysis and Interpretation

Year wise Distribution of Article

Table 1: Research Articles Published in Annals of Library and Information Studies

Year	Vol. No.	Issues	No. of Article in Each Issues				Total No. of Publications	% of Article	Cumulative Total of Articles	Cumulative % of Articles
			March	June	September	December				
2011	58	4	10	10	9	7	36	26.7	36	26.7
2012	59	4	6	6	8	7	27	20	63	46.7
2013	60	4	9	9	9	10	37	27.4	100	74.1
2014	61	4	9	8	11	7	35	25.9	135	100

Table 1 Analyzed that 135 articles published in Annals of Library and Information studies during the year 2011 to 2014. Out of 135 articles the maximum numbers of articles have been published in the year 2013 that is 27.4%(37). While the least number of articles published in the year 2012 (27 Articles, 20%). The analysis reveals that more research paper published in the year 2013 compared to 2011, 2012 and 2014.

Year wise Authorship Pattern of the contribution

Table 2 Year wise Authorship Pattern of the contribution

Sr. No.	Authorship Pattern	2011	2012	2013	2014	Total	%
1	One Author	14	11	13	12	50	37.0
2	Two Author	14	10	17	18	59	43.7
3	Three Author	7	6	5	3	21	15.6
4	Four Author	0	0	0	2	2	1.5
5	Five Author	0	0	2	0	2	1.5
6	Six Author	1	0	0	0	1	0.7
	Total	**36**	**27**	**37**	**35**	**135**	**100.0**

Table 2 Indicates that the majority of authors preferred to publish their research paper in two authorship mode that is 43.7% and single author mode 37%, while article published by three authors that is 15.6% and the few contributors are published their research paper in Four, Five and Six Author ship mode that is (1.5%, 1.5% and 0.7%).

Geographical Distribution of Contributors

Table 3 Country wise Contribution

Sr. No.	Rank	Country	2011	2012	2013	2014	Total	%
1	1	India	26	19	28	32	105	77.8
2	2	Nigeria	4	4	6	1	15	11.1
3	3	Bangladesh	4	0	1	0	5	3.7
4	3	Shrilanka	2	1	0	2	5	3.7
5	4	Africa	0	1	1	0	2	1.5
6	5	Fiji	0	0	1	0	1	0.7
7	5	Iran	0	1	0	0	1	0.7
8	5	Malaysia	0	1	0	0	1	0.7
Total			**36**	**27**	**37**	**35**	**135**	**100.0**

From the table 3 it is proved that there are a total 135 authors representing 8 different countries. The geographical distribution of articles is decided on the bases of address of author's affiliation given in the article. In this study, the share of contribution of India (77.8%) is found to be at the first rank among the other countries. Nigeria with the contribution of 15 articles ranked with second. Bangladesh and Shrilanka with 5

contributions each ranked third. Africa was the four ranked with 1.5% (2) contribution and rest of the country on fifth rank.

State wise contribution in India

Table 4 State wise Contribution of India

Sr. No.	Rank	State	2011	2012	2013	2014	Total	%
1	1	New Delhi	6	7	8	10	31	29.5
2	2	West Bengal	3	2	3	3	11	10.5
3	3	Karnataka	6	1	2	1	10	9.5
4	4	Maharashtra	2	0	2	5	9	8.6
5	5	Kerala	0	2	2	3	7	6.7
6	6	Jammu & Kashmir	2	0	2	2	6	5.7
7	7	Uttar Pradesh	1	1	1	2	5	4.8
8	8	Haryana	2	1	1	0	4	3.8
9	8	Himachal Pradesh	1	1	2	0	4	3.8
10	8	Punjab	0	0	1	3	4	3.8
11	9	Tamil Nadu	1	0	2	0	3	2.9
12	10	Chhattisgarh	0	0	1	1	2	1.9
13	10	Madhya Pradesh	1	1	0	0	2	1.9
14	10	Orrisa	1	0	1	0	2	1.9
15	10	Rajasthan	0	0	0	2	2	1.9
16	11	Andhra Pradesh	0	1	0	0	1	1.0
17	11	Gujarat	0	1	0	0	1	1.0
18	11	Meghalaya	0	1	0	0	1	1.0
Total	**26**	**19**	**28**	**32**	**105**	**100.0**	**Total**	**26**

Table 5 Ranking of Authors

Sr. No.	Rank	Name of the Author	No. of Article Contributed in 2011-2014
1	1	Dutta, Bidyarthi	5
2	2	Gupta, B.M.	4
3	3	Dutt, Bharvi	3
4	3	Mukherjee, Bhaskar	3
5	3	Ray, ParthaPratim	3
6	3	Sen, BimalKanti	3
7	4	Total 12 Authors	2 Each
8	5	Total 90 Authors	1 Each

In State wise distribution of contribution by different authors in India in Annals of Library and Information Studies, the table 4 reveals that 105 contributions are fromvarious18 states of India. New Delhi has contributed 29.5% (31), followed by the West Bengal 10.5% (11) contributions, Karnataka 9.5% (10) contributions, Maharashtra 8.6% (9) contributions, Kerala 6.7% (7) contributions, Jammu and Kashmir 5.7% (6) contributions, Uttar Pradesh 4.8% (5) contributions, Haryana, Himachal and Punjab 3.8 % (4) contributions, Tamil Nadu 2.9% (3) contributions, Chhattisgarh, Madhya Pradesh, Orissa and Rajasthan 1.9% (2) contributions. The rest of the states like Andhra Pradesh, Gujarat and Meghalaya have1.0% (1) contribution only. It is found that the most of the contribution arefrom New Delhi with first ranked and least of the contribution from Andhra Pradesh, Gujarat and Meghalaya.

Most Prolific contributors to Annals of Library and Information Studies

Table 5 reveals the ranking of authors. There are total 253 authors contributed 135 articles in the Annals of Library and Information studies during the period 2011 to 2014. From the table 5, it is found that the Dutta, Bidyarthi is the leading contributing author, who contributes 5 articles with first rank. Gupta, B. M. Contributed 4 Articles with the 2nd rank. Dutt, Bharvi, Mukherjee, Bhaskar, Ray, ParthaPratim and Sen, BimalKanti, who contributed 3 articles each, are on the 3rd rank. As per the table 5 , 12 authors contributed two articles each and 90 authors contributed one articles each.

Length of Articles

Table 6 Page Length of the Articles

Sr. No.	Year	Total No. of Article	Cumulative Total No. of Article	Total No. Pages	Cumulative Total No. of Pages	Average Pages of Article	Cumulative Average No. of Pages
1	2012	27	27	264	264	10	9.78
2	2011	36	63	338	602	9	9.56
3	2014	35	98	317	919	9	9.38
4	2013	37	135	294	1213	8	8.99

As per the Table 6,the maximum average length of pages of articles is 10 in the year 2012,while the minimum average pages of the articles is 8in the year 2013. It is found that Annals of Library and Information Studies have accommodated on an average 9 pages per articles in the years2011 and2014.

Citation Analysis: Year wise Distribution of Citations

Citation Analysis is based on the references provided by the authors at the end of the articles. Citation traces a connection between two documents, one which cites and other which is cited. The year wise distribution of citation in annals of library and information studies 2011-2014 as given in the table 7.

Table 7 Year wise Distribution of Citations

Sr. No.	Year	Total No. of Article	Total Citation of Article	% of Citation
1	2011	36	208	51.36
2	2012	27	91	22.47
3	2013	37	65	16.05
4	2014	35	41	10.12
Total		135	405	100.00

Table 7 shows that maximum number of citation received in the year 2011 that is 51.36 %(208) followed by 22.47% (91) in the year 2012, 16.05% (65) in the year 2013 and 10.12% (41) in the year 2014.

Forms of Document Cited

Table 8: Bibliographical forms of Document Cited

Sr. No.	Bibliographical Form	Total No. of Citation	% of Citation
1	Journal	323	79.75
2	Web Resources	38	9.38
3	Thesis and Dissertations	25	6.17
4	Conference/Seminar Proceeding	15	3.70
5	Books	3	0.74
6	Other	1	0.25
Total		405	100.00

Table 8 describes the Bibliographical forms of citations. It is found that the journal forms is the most leading form followed by Web Resources, Thesis and Dissertations, Conference/Seminar Proceeding, Books. Out of the total citation journals carry the highest citations that are 79.75% (323) followed by the Conference/Seminar Proceeding 3.70% (15), Books 0.74% (3), Thesis and Dissertation 6.17% (25), Web Resources 9.38% (38). The reset form which other were found less number of citations that is 0.25% (1).

Highly Cited Paper

Table 9: Highly Cited Papers

Sr. No.	Name of the Author and their Affiliation	Title of the Paper	No. of Citation
1	Deshmukh, Prashant P., Librarian, Phulishing Naik Maha Vidyalaya, Pusad - 445204, Tavatmal, Maharashtra	Citations in Annals of Library and Information Studies during 1997 to 2010: A study, Vol. 58, No. 4, December 2011, P. No. 355-361	16
2	Jeyshankar, R., Assistant Professor, Department of Library and Information	Research output of CSIR-central electro chemical research institute	15

	Science, Alagappa University, Karaikudi; Ramesh Babu B., Professor, Department of Library and Information Science, University of Madras, Chennai; P. Rajendran, University Librarian, S.R.M University, Chennai	(CECRI): A study, Vol. 58, No. 4, December 2011, P. No. 301-306	
3	Gupta, B. M., Emeritus Scientist, National Institute of Science, Technology and Development Studies, New Delhi; Har Kaur, Government Medical Collage, Chandigarh; Avinash Kshitig, National Institute of Science, Technology and Development Studies, New Delhi	Dementia research in India: A scientometric analysis of research output during 2002-11, Vol. 59, No. 4, December 2012, P. No. 280-288	14
4	Naresh Kumar, CSIR -National Institute of Science Technology & Development Studies, New Delhi; Nadia Asheulova, Center for Sociology of Science and Technology and Science Studies of IHST of Russian Academy of Science, Russia	Comparative analysis of scientific output of BRIC countries, Vol. 58, No. 3, September 2011, P. No.228-236	13

Table 9 shows the status of authors of contributions with more than 10 citations based on citation count through Google scholar. The entire Article individually searches at https://scholar.google.co.in/ and the number of citation noted down. The article titled "Citations in Annals of Library and Information Studies during 1997 to 2010: A study" contributed by Deshmukh, Prashant P., published in the Volume 58 and issue No. 4, December 2011, received highest number of citation that is 16.

7. Major Findings of the Study

- The contribution of articles in each volume of Annals of Library and Information Studies is increasing and decreasing from year to year. Majority of the article published in the year 2013 compared to 2011, 2012 and 2014.
- Most of the contributors preferred to publish their research paper in two authorship mode.
- Majority of the research papers published in the Annals of Library and Information Studies are from India. The share of contribution of India is found to be at the first rank among the other countries.
- It is found that in the state wise contribution in India, the most of the contribution from New Delhi with first ranked and least of the contribution from Andhra Pradesh, Gujarat and Meghalaya.

- It is found that the Dutta, Bidyarthi is the leading contributing author, who contributes highest number of articles with first rank.
- Annals of Library and Information Studies have accommodated on an average 9 pages per articles in the years 2011 and 2014.
- Maximum number of citation received in the year 2011.
- The journals form is the most leading form followed by Web Resources, Thesis and Dissertations, Conference/Seminar Proceeding, Books.
- The article titled "Citations in Annals of Library and Information Studies during 1997 to 2010: A study" contributed by Deshmukh, Prashant P. published in the Volume 58 and issue No. 4, December 2011, received highest number of citations.

8. Conclusion

INSDOC (now NISCAIR) launched Annals of Library Science as its first publication and Dr. S. R. Ranganathan was its first Editor. The journal's title was expanded to Annals of Library Science and Documentation in 1964 and again renamed in 2001 as Annals of Library and Information Studies. ALIS is the most leading LIS journal from India. Library Professionals, Scholars, researchers and academician are desire to refer articles published in the journal.It is expected that Annals of Library and Information studies will grow in days ahead.

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Scientometric Analysis of OLP Projects at CSIR--National Metallurgical Laboratory during 1995-2010, Jamshedpur, India: *A Case Study*

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Abstract: This study has reviewed 284 in-house projects executed at CSIR- National Metallurgical Laboratory in India during 1995-2010.Most of the projects were basic and applied research. They share 48 and 47 percent respectively, however, the combination of these two (basic & applied) constitute 5 percent only. A total of 29 R&D domains have been identified that fall in the ambits of Metallurgy, Materials Science and related subjects. An optimal number of 56 projects were related to materials characterization, followed by steels (32 projects) and mathematical modeling & simulation (23 projects.). The deliverable of each projects were analyzed and found that 20 patents, 5 copyrights filled and 40 processes have been developed. The study, among other things, analyzed Research performance , research publications and societal impact, including contribution towards public goods to academia in pursuing higher education such as PhD, Post doctorate fellowship, B.Tech, M.Tech under each projects.

Key Words- Scientometric Analysis, R&D Projects, Projects Evaluation, CSIR-National Metallurgical laboratory, Impact Factors, Citation Analysis, Public Goods

1. Introduction

National Metallurgical Laboratory is world's premier R&D Laboratory situated in India's largest minerals reach belt at Singhbhum District, Jamshedpur, Jharkhand (Erstwhile Bihar).The CSIR-NML is one of the fourth oldest R&D laboratories working under the aegis of Council of Scientific & Industrial Research, India. It started functioning in 1950. The laboratory has completed 60 years in 2010. Since then, it has been catering the R&D needs to minerals and allied industries located in India and overseas. The R&D work mainly carried out in the area of Minerals, Metals, Metallurgy, & Materiel science. During 1995 to 2010, a total of 284 in-house projects were accomplished at National Metallurgical Laboratory with an investment of Rupees 156.28 Lakhs for creating infrastructure for in-house projects. Most of them are Basic and Applied research in the area of Minerals, Metals, Metallurgy and Materiel Science. The projects have been successfully completed at laboratory scale level with utilization of in-house equipment and other facilities included the available information resources provided from Information Management and Dissemination Centre.

Scientific efforts and curiosity driven projects produced and upgraded knowledge- base as well as added infrastructure for the existing facilities, and expertise tailored to current need. The R&D range from characterizations and beneficiation of lean grade ores in the area of minerals processing to extraction of metals. Metal forming and characterization to surface engineering was found as the major area of research. Depletion of natural resource and pollution is noticed to be the serious concern that why a good number of projects have been carried out on recovery of metals from secondary waste. Research assessment usually helps in finding out ranking pattern as research profile of a particular research institute or group of research institutes, university department, a faculty or complete university. This report is concerned with evaluation of in-house projects completed at National Metallurgical Laboratory, Jamshedpur during 1995-2010.

2. Methodology

Bibliometrics method, usually applied for monitoring and evaluating research units and institutes, particularly in new and problem-oriented interdisciplinary fields. To measure effectiveness of In-house Projects at National Metallurgical Laboratory during 1995-2010, data were collected from various sources like, questionnaires, personal interview, NML in-house project database, annual reports (1995-2010), project reports, on-line databases like Science Citation Index, Metal Abstracts.

3. Objectives

This study includes the following aims and objectives pertaining to in-house projects.

- Year wise Growth of OLP;
- R&D Area wise distribution OLP;
- Involvement of Human Resource
- R&D output
  - Objectives of Research Findings;
  - Technology Reported (Patents/Copyright Generated);
  - Collaboration for further R&D programme;
  - Contribution towards public goods;
  - Awards/Honors won by OLP
  - Uses of Equipment
- Publications Output;
  - Year wise publications of papers during 1995-2010;
  - Channels of communication;
  - Major R&D Area wise distribution of Papers, Citations, RCI & ACI;
  - Top fifteen Highly Cited Papers as per SCI Database.

4. Result and Discussion

The present study has evaluated 284 in-house Projects spanning 16 years. Keeping in view the objectives, the data were designed and charts prepared in a way, which would give important information for evaluation of projects.

- **Year wise Growth of GAP during 1995-2010:** The resultant data clearly unearths that, during 1995-2010, 284 OLP projects were accomplished at National Metallurgical Laboratory, Jamshedpur. Table -1 and figure-1 depicts year wise distribution of these 284 projects. The maximum 32 projects (11.26 percentages) were completed in 1999, followed by 29 projects (10.21percentage) in 2004 and the year 1998 and 2005 share equal number 26 (9.15 percentage) respectively. The overall distribution of in - house projects can be seen in figure 2 with cumulative growth. It provides 16 years scenario of in-house projects mostly on basic and applied research carried out at NML. Figure on projects status shows the growth pattern.

Table 1: Year wise distributions of OLP during 1995-2010

Years	Number of Projects	%	Cumulative
1995	4	1.40	4
1996	2	0.70	6
1997	16	5.63	22
1998	26	9.15	48
1999	32	11.26	80
2000	23	8.09	103
2001	24	8.45	127
2002	3	1.05	130
2003	24	8.45	154
2004	29	10.21	183
2005	26	9.15	209
2006	21	7.39	230
2007	20	7.04	250
2008	14	4.92	264
2009	14	4.92	278
2010	6	2.11	284

- **Distribution of OLP during 1995-2010 according to R&D Areas:** It is essential to evaluate projects on R&D area- wise for determination of prolific areas as well as strength of the laboratory that must be relevant to the current needs of the society. Hence, total 284 projects were categorized and found that, various subject areas, ranging from minerals beneficiation and characterization of indigenous ores to alloys development. To check environmental pollution from waste, a good number of projects were related to waste management and its utilization like extraction of metals from electronic wastes, effluent from industrial waste and purification of water. To increase the iron productivity, some projects deals with Blast furnace modeling and simulation. After subjectwise categorization of projects, it was found that all projects spread over 29

R&D areas fall in the domain of Minerals,Metals,Metallurgy and Materials Science.A maximum 19% projects fall in the area of Materials Chracterization , followed by steels , which constitute more than 11% projects. Modeling & Simulation, Surface Engineering comprises 8 percent only. The status of other R&D areas can be observed in table 2.

Table 2 R&D Areas of OLP during 1995-2010

Sl. No.	R&D Area	No. of Projects	%	Cumulative
1	Adsorbents	1	0.35	1
2	Alloys Development	6	2.10	7
3	Analytical Chemistry	1	0.35	8
4	Blast Furnaces	3	1.05	11
5	Ceramics & Refectories	1	0.35	12
6	Composites Materials	8	2.80	20
7	Control & Instrumentation	3	1.05	23
8	Foundries	2	0.70	25
9	Ld Sludge	1	0.35	26
10	Materials Characterization	56	19.64	82
11	Materials Development	16	5.61	98
12	Mechanochemistry	8	2.80	106
13	Metals & Alloys	17	5.96	123
14	Metals Extraction	8	2.80	131
15	Minerals Processing	20	7.01	151
16	Modeling & Simulation	23	8.01	174
17	Nanoindentation	1	0.35	175
18	Polyaluminium	6	2.10	181
19	Powder Metallurgy	11	3.85	192
20	PVC Membranes	1	0.35	193
21	S&T Managements	4	1.40	197
22	Soft Ware Development	2	0.70	199
23	Solvent Extraction	14	4.91	213
24	Steels	32	11.22	245
25	Surface Engineering	21	7.36	266
26	Thermodynamics	1	0.35	267
27	Waste Management	14	4.91	281
28	Water Purifications	1	0.35	282
29	Water Quality Assessment	3	1.05	285

5. Work force Participation in OLP

The contributions of personnel for evaluating OLP were calculated by involvement in each project. A total 712 personnel at different level were engaged, the level has been scaled as per designation of scientists, technical personnel, research scholar and their responsibility associated with Project as Project Leader, CO-Project Leader and Member. The scale of different level has been made as follows:

- Level-1 Scientist - B, C, E-1; (Lower Level)

- Level-I1 Scientist – E-II; (Middle Level)
- Level-1II Scientist – F, G. (Higher Level)
- Technical Personnel -(Technical Grade III/1--7)
- Research Scholars- (JRF, SRF, QHF, Project Assistant)

The data pertaining to human resource is based on the statements are presented in table-3 for analysis and interpretation. It is clear from table that, junior level scientists performed outstanding and can be placed at rank 1 with participation in 51.82% of the total work force involvement. A total 369 personnel were engaged in handling 187 projects at various capacities –project leader (187), co-project leader (53), and members (129). The senior level scientist's registered second rank with participation in 129 projects contributed at different capacities- project leader (29), co. PL (25), and as member (75), over all 18.11% of human resource meet from this group, where as middle level scientists are found involved in 119 OLP with different responsibility as project leader (45), co Project leader (39), member (35).This group over all constitute 16.71% of the total manpower and may be placed in third rank. The technical personnel and research scholar also extended their valuable contributions for completion of R&D as team member. The scaling of work force has been made by grouping of scientists and technical personnel as scientists –"B" to ,E-1- juniors Level, scientists- E-II-middle level, scientists-"F" to "G" Higher Level.

Table 3: Contributions of Personnel under In-House Projects

Designation	Level of Contributions	Cumulative	%			
	Project Leader	CO-Project Leader	Members	Total		
Junior Level	187	53	129	369	369	51.82
Middle Level	45	39	35	119	488	16.71
Senior Level	29	25	75	129	617	18.11
Technical	6	9	62	77	694	10.81
Research Scholar	8	1	9	18	712	2.52
Total	275	127	310	712	--	100.00

6. R&D output of OLP (1995-2010)

The effectiveness of OLP projects has been evaluated through various criteria like, switch over to further R&D programme, new processes developed, technology transferred, technology reported, patents, copyright filed, awards won through projects, are considered as major parameter for this study . The R&D output is determined through feedback received from the concerned project leaders shown in given questionnaire. The data were then analyzed based on the extent to which the projects meet its objectives. A total 284 projects analyzed and found that, 48% projects were on Applied Research; followed by 47% on basic Research where as a combination of basic + applied scales share 5% only.

- **Awards/Honors won under OLP:** Awards won are usually considered as a reliable parameter by which R&D projects can be evaluated. During 1995-2010, a total 20 awards of different categories were won based on performance of research findings; however, awards may or may not be reflected overall performance of the concerned

project. The case study reflects that, applied research won maximum numbers of awards, comprises 1-National, 1-best paper, 2-poster and 7- local awards where as Basic + Applied Research categories won only one National and 1-best papers awards respectively. The overall performances of the different categories of research are shown in table-4.

Table 4: Awards/Honorary won under OLP

Level of Research	wards/Honors won by GA			
	National	Best Paper	Poster Awards	Local (NML)*
Basic Research	3	-	1	3
Applied Research	1	1	2	7
Basic+Applied Research	1	1	-	-
Total	5	2	3	10

Local (NML) - Yearly provided by National Metallurgical Laboratory*

7. Publications Output

- **Papers published under OLP during 1995-2010:** During 1995-2010, a total 360 papers were reported under OLP in the areas of metallurgy, materials science and allied subjects. Year wise distribution of papers appeared in various formats are depicted in table- 5 for analysis and interpretation.

Table- 5 Year wise distribution of publications contributed under OLP during 1995-2010

Year(s)	Papers		Proceedings		Book Chapter
	SCI	Non SCI	National	International	
1995	-	-	-	-	-
1996	-	-	-	-	-
1997	5	2	1	2	-
1998	-	-	-	1	-
1999	10	-	1	3	-
2000	10	5	1	2	1
2001	17	3	2	5	-
2002	12	-	4	2	-
2003	21	2	2	1	-
2004	28	2	2	1	2
2005	9	3	2	5	1
2006	26	-	3	10	-
2007	26	2	8	9	-
2008	20	1	5	11	-
2009	21	-	3	11	-
2010	24	-	1	8	1
Total	229	20	35	71	5

8. Analysis and Interpretation

The year 2007 was on first rank with a total 45 papers were published, 26 in SCI, 2 in Non-SCI, 8 National proceedings,9 in an international proceedings, while the year 2006 produced 39 papers, followed by SCI encompasses 26 papers and National and International proceedings shared 3 and 10 papers only. The year 2008, got third rank, with contribution of 37 papers, out of which, 20 SCI, 1 Non-SCI, 5 National proceedings, 11 International proceedings. The overall performance in publications contributed under OLP can be referred in table- 5.

- **Highly Cited Papers of OLP during 1995-2010**

The potentiality and credibility of a researcher and his findings are often judged by the number of times; the paper(s) has/have been cited. The more a paper is cited, the greater would be its research value and impact as often constructed. The resultant data pertaining 15 highly cited papers are shown in Table-7 fewer than five broad categories along with the percentage of average citations a paper receives. Highly cited papers of the Chemistry Division of the Bhabha Atomic Research Centre were beautifully sketched by Kademani et.al. The same model was employed for GAP publications of NML and findings of same are presented as 15 highly cited papers. Citation life cycles of the four highly cited papers have been given in table 7 with bibliographic details.

- **Analysis and Interpretation**

The paper P1 has received a total of 32 Citations during 2006-2010, out of which 2 were self-citations. This paper has received citations after one year of its publication. The average Citations per year was 5.33. There were 23 journals Citing this papers. Diachronous self-citation rate was 6.25. The paper P2 has received 31 Citations during 2007-2010, out of which, 1 was self-Citation. This paper has received citation after one year of its publications and continues to receive citations during the period under study. This paper was 1 time self –cited by author. The average Citation per year was 6.20. There were 18 Journals in all, which were citing this paper. Diachronous self-citation rate, however, remain at 3.22. The paper P3 has received 30 Citations during 2003 to 2010. This paper has received citations after 1 year of its publication and continues to receive citations during the period under study. This paper has been cited in 18 Journals and the average rate of citation per year was 3.33. Diachronous self-citation rate was 33.33. The paper P4 has received 25 Citations during 1999-2010. This paper has received citation after one year of its publication and continues to receive citation during the period under study. The average citations per year were 1.92.The work was cited in 20 journals.

$$\text{Diachronous self Citation Rate} = \frac{\text{Self-Citation to an article in SCI Database}}{\text{Total number of Citations Received to an Article in SCI Database}} \times 100$$

Table -7 Highly Cited Papers of OLP during 1995-2010 (as on 26.12.2011)

Paper/ Project	Bibliographic details of Highly Cited papers	SC	CO	TC	CTY	DR	Average Citation
P1/ OLP 0063	Kumar,S;Kumar,R;Bandopadhyay.Innovative methodologies for the utilization of wastes from metallurgical and allied industries, Resources Conservation & Recycling 48(4),pp301-314 (2006)	2	30	32	1	6.25	5.33
P2/ OLP 0038	Poddar Palash; Srivastava V. C.; De P. K; Sahoo, K. L. Processing and mechanical properties of SiC reinforced cast magnesium matrix composites by stir casting process, Materials Science & Engineering "A" Structural Materials Properties Microstructure and Processing,V460(1-2),pp357-364 (2007).	1	30	31	1	3.22	6.20
P3/ OLP 07731	Sinha,A;Nayar,S;Agrawal,A; Bhattacharyya, D. Synthesis of nanosized and microporous precipitated hydroxyapatite in synthetic polymers and Biopolymers, Journal of the American Ceramic Society,V86(2),pp357-359 (2003)	10	20	30	1	33.33	3.33
P4/ OLP 08131	Pathak,LC;Ray,AK;Das,S;Sivaramakrishnan,CS; Ramachandrarao, P. Carbothermal synthesis of nanocrystalline aluminum nitride power, Journal of the American Ceramic Society 82(1),pp257-260 (1999)	0	25	25	1	0.0	1.92
P5/ OLP 14331	Agrawal,A;Sahu,KK; Pandey, BD. Removal of zinc from aqueous solution using sea nodule, Colloids & Surfaces A-Physicochemical & Engineering Aspects , V.**237(1-3),pp133-140 (2004)**	0	25	25	1	0	3.12
P6/ OLP 09531	Mishra,SK;Das,SK;Ray,AK Effect of Fe and Cr addition on the sintering behavior of ZrB2 produced by self-propagating high-temperature synthesis, Journal of the American Ceramic Society 85(11),pp2846-2848(2002)	0	24	24	2	0	2.40
P7/ OLP 18531	Maity S; Chakravarty S; Thakur P; Gupta, KK;Bhattacharjee,S; Roy, BC. Evaluation and standardization of a simple HG-AAS method for rapid speciation of Sa (III) and As (V) in some contaminated groundwater of West Bengal, India, Chemosphere V**54 (8),pp1199-1206 (2004).**	2	22	24	1	8.33	3.00
P8/ OLP 07731	Nayar,S Sinha,A, Systematic evolution of a porous hydroxyapatite-poly(vinyalcohal)-gelatin composite Colloids and Surfaces B-Biointerfaces,V.35(1),pp29-32 (2004)	6	17	23	1	26.08	2.88
P9/ OLP 2003	Agrawal, Archana; Sahu, K. K. Kinetic and isotherm studies of cadmium adsorption on manganese nodule residue, Journal of Hazardous Materials, V.**137(2),pp 915-924 (2006)**	0	23	23	2	0	2.43
P10/ OLP 2003	Kumar,BR;Singh,AK;Das,S;Bhattacharya,DK.Cold rolling texture in AISI 304 stainless steel, Materials Science & Engineering "A" Structural Materials Properties Microstructure and Processing,V364(1-2),pp132-139 (2004)	3	19	22	1	13.63	2.75
P11/ OLP 0013	Sasikumar,C;Rao,DS;Srikanth,S;Mukhopadhyay,N; Mehrotra, S. P. Effect of mechanical activation on the kinetics of sulfuric acis leaching of beach sand ilmenite from Orissa, India,	1	21	22	2	4.76	2.75

	Hydrometallurgy 75(1-4),pp 189-204, (2004)						
P12/ OLP 13231	Ray, AK; Steinbrech, RW. Crack propagation studies of thermal barrier coatings under bending, Journal of the European Ceramic Society, 19(12),pp2097-2109 (1999)	13	8	21	2	61.90	1.62
P13/ OLP 08331	Puvvada, GVK. Liquid-liquid extraction of gallium from Bayer process liquor using Kelex 100 in the pressure of surfactants, Hydrometallurgy 52(1),pp9-19 (1999)	0	21	21	1	0	1.62
P14/ OLP 19831	Babu,MN; Sahu KK;Pandey,BD.Ammoniacal leaching of roast reduced deep-sea manganese nodules,Hydrometallurgy,V.64(2),pp 119-129 (2002)	3	17	19	2	15.78	1.46
P15/ OLP 0073	Kumar, S; Narayanan, TSNS. Corrosion behavior of Ti-15Mo alloy for dental implant applications, Journal of Dentistry,V36(7),pp500-507 (2008)	5	13	18	1	27.77	4.50

Source: www.isiknowledge.com visited on 27.12.2011

SC-Self Citation, CO- Citation by others, TC-Total Citation, CTY-Citation Lag, DR-Diachronous ratio (determined by applying following formula).

9. Conclusion

This study has reviewed 284 projects executed at National Metallurgical Laboratory during 1995-2010.Most of the projects were basic and applied research. It share 48 and 47 percent respectively, however, the combination of these two (basic & applied) constitute 5 percent only. There are 29 R&D areas has been identified. The maximum 56 projects fall in the area of materials characterization, followed by steels (32 projects) and mathematical modeling & simulation (23 projects.). The output of projects analyses and observed that 20 patents, 5 copyrights filled and 40 processes has been developed in the area of minerals, metals, metallurgy and materials science. The in-house research has produced a lot of deliverable like techniques, protocol, software, and infrastructure developed. Research performance further analyses research publications and societal impact, contributed towards public goods to academia for pursuing higher education such as PhD, Post doctorate fellowship, B.Tech, M.Tech under each projects. A total 365 research papers published, out of which 232 papers reported in SCI Journals, 21 Non-SCI and 36 national and 71in an international proceedings. Research output further analyses according to value added tools like citation and impact factors and found that 232 SCI papers received 1073 citation and average impact factor of papers remain 1.207.The societal impact measure by analyzing contribution towards public good, awards won and collaborations of research findings to others categories of projects are considered as approach to judge the worth of research for last 16 years at NML

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Study of M Sc Theses in the Department of Agriculture Economics and Agronomy at JNKVV Jabalpur (M.P.)

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Abstract: This paper deal with bibliometric monitoring of M.Sc. theses in Agriculture Economics and Agronomy at JNKVV Jabalpur, (M.P.). The study period of 5 Year (2009-2013) covering total theses of two department theses are 354. Department of Agriculture Economics theses are 199 and Agronomy theses are 155. The study has been analyzed year-wise, department-wise, guide-wise, gender-wise, Place-wise.

Keywords: Bibliometric, Agriculture Economics, Agronomy, Theses

1. Introduction

In this time research is directly connected with progress and development, which refer to a search for a new knowledge and facts. Thus bibliometric study is a sort of measuring techniques by which interconnect aspect of written communication can be quantified. Research as an Academic activity and as such the term should be used in a technical sense. According to Gorman and Clayton, "Research is a process of enquiries that draws from the context in which events occur, is an attempt to describe these occurrences, as a mean of determining the process in which event are embedded and the perspective of those participating in the events, using induction to derive possible explanation based on observed phenomena.

2. Objective of the study

- To Analyze Research Department-wise.
- To Analyze Year-wise.
- To Analyzed Gender-wise.
- To Analyzed Editor-wise.
- To Analyzed Research at Place-wise
- To Analyzed Research trends in JNKVV Jabalpur (M.P.)

3. Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jablapur (M.P.):

Located in the heart of India, named after the architect of modern India, Pt. Jawaharlal Nehru, a multi-campus University, Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV) was inaugurated by the then Union Minister for Information and Broadcasting Smt. Indira Gandhi on October 2, 1964. Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV), Jabalpur was established in 1964, as the biggest multi-campus university, with an approach to narrow down the gap between the experts and farmers, through Joint Indo-American Team on Agricultural Research and Education in 1954-55 and 1959-60 on the patterns of Land Grant Colleges of USA. In subsequent years, the University had to part with its area of jurisdiction due to creation of sister universities- Indira Gandhi Krishi Vishwavidyalaya (IGKV) at Raipur in 1987, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya (RVSKVV), Gwalior in 2008 and Nanaji Deshmukh Pashu Chikitsa Vigyan Vishwa Vidyalaya, Jabalpur in 2009. The State received "Krishi Karman Award" at national level for two consecutive years, i.e. for the years 2011-12 and 2012-13. The area covered by the University is not only large but also diversified. Since its establishment the university has made laudable progress and has come to the expectations of the people of the state by greatly benefiting the farming community.

4. Data Analysis

This study reveals that 354 M.Sc. degrees have been awarded so for to professional in the field of Agriculture Economics and department of Agronomy at JNKVV Jabalpur (M.P.) among them, 345 research studies of M.Sc. degree awarded to Agriculture Economics department and Agronomics department of in this study, research or analyzed data to validate information about year wise growth and subject wise M.Sc. theses.

Table 1: No. of case Study

S. No.	Total Theses	Theses of Agriculture Economics	Theses of Agronomy
1	354	199	155

Table No.1- analysis show that majority of the theses submitted by Agriculture Economics subjects are very popular among research students the theses submitted are 199 and Agronomy department theses submitted are 155 and total theses are 354 at JNKVV Jabalpur (M.P.).

Year-Wise Distribution: Total 354 M.Sc. theses have selected for the study. The following table presents the year-wise distribution (chronological) of samples:

Table 2: Year wise Distribution of M.Sc. theses

S. No.	Year	Agriculture Agronomics	Agronomy	Total theses
1	2009	46	48	94
2	2010	39	34	73
3	2011	39	30	69
4	2012	46	23	69
5	2013	29	20	49
Total	**199**	**155**	**354**	

The highest number of theses submitted in the year of 2009(Agriculture Economics-46 and Agronomy-48) followed by year 2010(Agriculture Economics-39 and Agronomy-34). The third position goes to the year of 2011&2012(Agriculture Economics-39 and Agronomy-30; Agriculture Economics-46 and Agronomy-23). The least position goes to the year of 2013(Agriculture Economics-29 and Agronomy-20).

Gender-Wise Distribution: Table 3 shows the Gender-wise distribution of the Agriculture Economics and Agronomy M.Sc. theses. Table depicts that 255 of male candidates and 99 are found occupied by female candidates.

Table 3: Gender-wise Distribution of M.Sc. theses

		Agriculture Economics					Agronom
S. No.	Year	Male	Female	Total	Male	Female	Total
1	2009	35	11	46	35	13	48
2	2010	25	09	39	25	09	34
3	2011	20	10	39	20	10	30
4	2012	15	08	46	15	08	23
5	2013	14	06	29	14	06	20
Total		**146**	**53**	**199**	**109**	**46**	**155**

Table No.3- This table shows that the highest number of male and female theses submitted in the year 2009 were 35 male and 13 female total 48 theses are department of Agronomy submitted, the Second highest number of theses submitted in the year 2009 were 35 male and 11 female total 46 theses are submitted Agriculture Economics department and the third position goes to the year 2011 were 20 male and 10 female, the fourth position goes to the year 2012 were 15 male and 08 female, the lowest number of theses submitted during the year 2013.

Chairman/Guide-Wise Distribution: Chairman/Guide-wise distributions of M.Sc. theses are shown in table 4 and table 5.

Table 4: Chairman/Guide-wise of M.Sc. these for Agriculture Economics

S. No.	Name of Chairman/Guide	No. of Theses
1	Awasthi, A.K.	2
2	Awasthi, A.M.	1
3	Awasthi, P.K.	17
4	Beohar, B.B.	7
5	Bisen, P.K.	2
6	Chand, Prem	1
7	Chaubey, K.G.	19
8	Dwivedi, M.L.	1
9	Gautam, D.S.	1
10	Gupta, S.K.	5
11	Jain, S.K.	2
12	Khan, N.	5
13	Malviya, P.K.	1
14	Mishra, A.M.	10

15	Mishra, P.K.	2
16	Nahatkaar, S.B.	6
17	Radhuwanshi, N.K.	20
18	Raghuwanshi, P.S.	4
19	Rajput, A.M.	1
20	Sahu, R.M.	9
21	Sarawgi, A.K.	23
22	Sharma, H.O.	9
23	Sharma, N.P.	2
24	Sharma, O.H.	1
25	Shrivastava, A.	15
26	Shrivastava, R.N.	1
27	Shrivastava, S.N.	7
28	Soni, S.N.	3
29	Tiwari, D.	1
30	Tiwari, D.N.	15
31	Tiwari, N.D.	6
Total	**199**	

Table No. 4 shows case studies under the research of M. Sc. Theses. Sarawgi, A. K. are first position with 23 theses and Second position are Radhuwanshi, N. K. with 20 theses and the third position are Chaubey, K.G. with 19 theses editor for department of Agriculture Economics JNKVV, Jabalpur (M.P.).

Table 5: Chairman/Guide-Wise of M.Sc. these for Department of Agronomy

S. No.	Name of Chairman/Guide	No. of Theses
1	Agrawal K.K.	6
2	Agrawal, S.B	7
3	Baghel, M.S	3
4	Bhan, Manish	2
5	Choudhary, S.K.	1
6	Deshmukh M.R	7
7	Deshpande, S.L.	1
8	Dubey, D.P	11
9	Dwivedi V.D.	5
10	Gautam, V.S.	1
11	Gupta, S.C.	1
12	Jain, K.K.	1
13	Jain, M.P.	2
14	Jain, Namrata	1
15	Jain, R.C	1
16	Jha, A. K.	3
17	Jha, Girish	8
18	Jyotishi, Alok	5
19	Kewat, M.L.	7
20	Kushwah, S.S.	1
21	Mahajan, Gaurav	2
22	Maurya, B.M.	9

23	Mehra, C.M.	1
24	Mujalde, Santosh	1
25	Naik, K.R	5
26	Pahalwan, D.K.	1
27	Panday, A.K.	1
28	Rajput, R.L.	1
29	Rathi, G.S.	1
30	Rawat, Anay	1
31	Rawat, G.S.	1
32	Sapre, Nisha	3
33	Sharma, A.K.	2
34	Sharma, J.K	5
35	Sharma, R.S.	2
36	Shukla, V.K.	6
37	Singh, R.P	2
38	Singh, Rohan	2
39	Thakur, H.S.	1
40	Thakur, N.S.	1
41	Tiwari, R,K.	8
42	Tomar, S.S.	2
43	Tyagi, P.K.	3
44	Upadhyay, V.B.	8
45	Vishwakarma, S K.	6
46	Vyas, M.D.	2
47	Yadav, K.S.	2
48	Yadav, R.P.	1
49	Yadav, Shivaji	1
	Total	**155**

Table No.5- shows case studies under the research of M.Sc. Theses. The First choice of the research scholar Dubey, D.P. Editor are first position with 11 theses and Second position are Morya, B. M. with 9 theses and the third position are Upadhyay, V. B., Tiwari, R. K. and Jha, Girish with 8 theses editor for department of Agronomy JNKVV Jabalpur (M.P.).

Place (College)-Wise Distribution: Chairman-wise distributions of M.Sc. theses are shown in table 6.

Table 6: Place (College)-wise distribution of M.Sc. theses

Agriculture Economics	**Department of Agronomy**				
S. No.	Place(College)	Theses	Place	Theses	Total
1	Jabalpur	176	Jabalpur	91	267
2	Indore	02	Indore	11	13
3	Rewa	15	Rewa	33	48
4	Sehore	06	Sehore	08	14
5	Gwalior	-	Gwalior	08	08
6	Tikamgarh	-	Tikamgarh	04	04
Total	**199**		**155**	**354**	

Table No. 6 Analysed that 267 theses are submitted were Jabalpur and 48 theses for Rewa and third position of Sehore 14 theses are submitted and lowest position of Tikamgarh. The first choice of research scholar of Jabalpur and Rewa.

5. Conclusion

The study shows the detail of M.Sc. theses by using Bibliometric study of JNKVV, Jabalpur. It is clear from the study 354 these awarded by the JNKVV, Jabalpur (M.P.). Their topics were 155 related department of Agronomy and 199 related of Agriculture Economics. The First choice of the research scholar Dubey, D. P. Chairman are first position with 11 theses department of Agronomy and Sarawgi, A. K. chairman are first position with 23 theses submitted by Agriculture Economics and research place is Jabalpur first choice of the research scholar JNKVV Jabalpur (M.P.).

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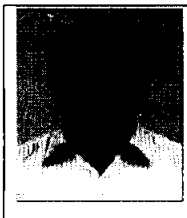
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Web Analytics and Performance Evaluation of Indian Library Association: *A Critical Study*

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Abstract: The paper discusses the maximum accurate trends and indications of Indian Library Association Website's utility in terms of the usage count hits, files, pages, sites, hosts and visits, as well as daily averages of these counters for each month during the period from January to December 2015. The study will help web analysts, website developers, IT professionals who are engaged in web design and development. Such studies are also important for digital marketing professionals who wish to know the trend of visitors and value of content in changing desire of users. The study is very important to librarians, information analysts, digital and virtual librarians, archive host and developers, digital content analysts, etc. It will be useful to researchers and authors who are in the field of conducting web study, research and content analysis search techniques. The content providers, institutions, business groups, to look into the trends and make appropriate policies related to web modeling and designing on the basis of inferences depicted from the analysis. The web managers, policy planning and decision makers can track webometrics to make strategic and administrative decisions.

Keywords: Content Analysis; Web Analytics; Performance Evaluation; Bibliometric; Scientometric Webometrics, Cybermetrics

1. Introduction

The term webometrics was first coined by Almind and Ingwersen (1997). A second definition of webometrics has also been introduced, "the study of web-based content with primarily quantitative methods for social science research goals using techniques that are not specific to one field of study" by Thelwall, M. (2009), which emphasizes the development of applied methods for use in the wider social sciences. The purpose of this alternative definition was to help publicize appropriate methods outside of the information science discipline rather than to replace the original definition within information science. According to Björneborn and Ingwersen (2004)4, the definition of webometrics is "the study of the quantitative aspects of the construction and use of information resources, structures and technologies on the Web drawing on on bibliometric and informetric approaches." It includes link analysis, web mention analysis, blog analysis and search engine evaluation, but from the perspective of digital library evaluation the main method is link analysis.

2. Objectives of the study

- Figure out the annual, monthly, daily, and hourly statistics;
- Assess the indications of web search on the thrust areas;

- Count specific content pages visited by a visitor;
- Measure the specific page content downloaded by the visitor;
- Count specific content page entry and exit by the visitor;
- Calculate the number stats of visitor / host machine or URL, which a visitor used;
- Find the names of host / URL, where the data have been downloaded;
- The list of referrers websites/pages, which a visitor referred;
- Summary of visiting timings;
- Provide the record of user's sites / IP numbers / hostname;
- Record the search strings / keywords used to find website through search engines;
- List of agents names / browsers used by the visitors;
- Count the geographical locations and extensions of the visitors;
- Assess the indications of overall usage of content quality for future prospects;
- Discuss the thrust areas of website, content pages and technical issues, where improvement required;
- Highlight critically on the inferences and raise the discussions.

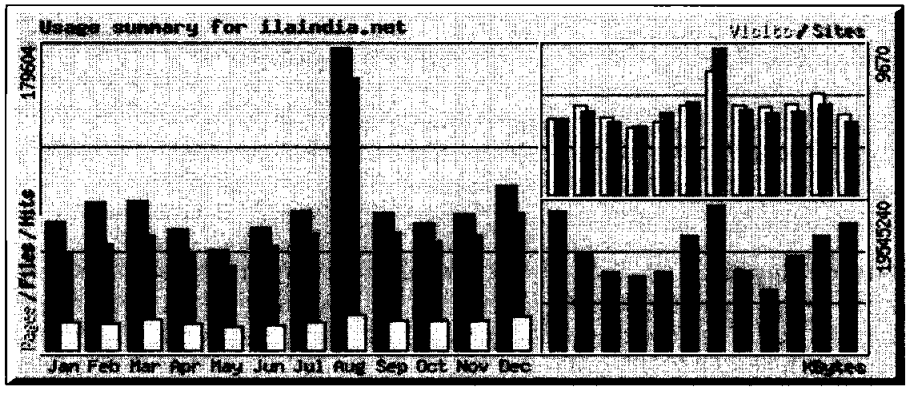
3. Methodology

The Webalizer (version- 2.23-08) software was installed for the purpose in web admin section under the Metrics panel of website. It is a web server log file analysis program which produced usage statistics in HTML format. It is available in over 30 languages under the GPL. It was selected being the most reputed and very comprehensive tool covering all aspects of topic under study. It facilitates quick and powerful access to the world wide usage data. It helped in analyzing the performance of web pages, identifying significant trends of usage, determining the value of content and usage of pages. The terminology attached as an annexure –I at the last page have been understood properly. The study result shows the path to redesign the web pages; enhance the quality of content; remove the less used pages; focus on user's interest pages and content. There are various types of statistics tools, i.e., Visitors, Errors, Bandwidth, Raw access, Awstats, Webalizer, Webalizer FTP, Metrics Editor and CPU & Concurrent connection usage, etc., available to record the data. The transactions data have been fetched from the admin account of the website through selected software. The data retrieved through the software have been downloaded in word and excel files. The downloaded data were analysed, filtered, sorted and presented in tables, graphs and textual form as per the study requirement Rajesh Kumar Bhardwaj (2015).

4. Statistics output, data interpretation and analysis of records

The retrieved data for the period from January to December 2015 was manipulated to facilitate in chronological order (annually, monthly, daily and hourly including processing times), usage by host, visitor's URL paths, referrer, user agent, search string to find target pages, entry/exit page by visitor, username/ hostname/ IP addresses of client, origin country of visitor, etc. In order to present the usage in the form of hits, pages, files and data download by the visitors have been illustrated as per the relevancy. The website traffic analysis has been presented by grouping and aggregating various data items recorded by the web server in the form of log files while the website visitor is browsing the website. After filtering the recorded data, the results have been presented in both columnar and graphical format, which facilitates interpretation about aforementioned usages. The transaction data have been analysed and presented in two kinds of reports - a yearly summary report and a detailed monthly report which covers aforementioned aspects.

- **Yearly usage statistics summery for the period of January to December 2015:** The yearly summary report provides the information about the number of hits, file and page requests, hosts and visits, as well as daily averages of these counters for each month. The report is accompanied by annual summary graph. The highest number occurred during the month of August as mentioned below, i.e., sites - 9670, Kbytes downloaded - 19545240, visits – 8106, pages - 20802, files - 161105 and hits - 179604 with the highest daily average, i.e., hits - 5793, files – 5196, pages – 671 and visits –261. The lowest monthly totals, i.e., sites - 4487, visits – 4423, pages - 13272, files - 49903 and hits – 59562 occurred during the month of May and Kbytes downloaded – 8059138 during the month of October. The lowest daily average occurred during the month of May, i.e., hits – 1921, files – 1609, pages – 428 and visits –142.
-



Graph -1

- **Monthly Usage Report for the Period: December 2015:** The monthly report provides the information about the unique sites, URL's, referrers and user agents, and maximum & average of hits per hour, per day, and files per day, pages per day, sites per day, visits per day, downloads in KBytes per day, and also hits by response code with percentage,

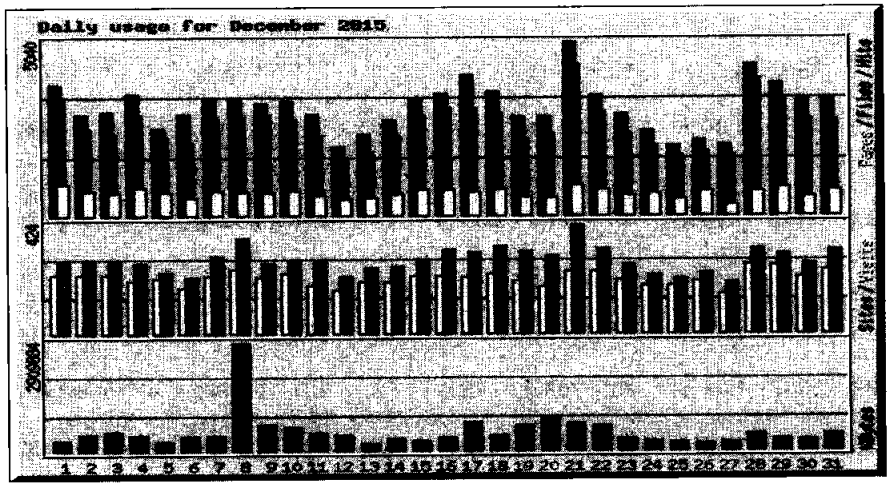
i.e., "Code 200 – OK" with maximum hit 81463 (83.67%), "Code 206 - Partial Content" with maximum hit 5888 (6.05%), "Code 304 - Not Modified" with maximum hit 3012 (3.09%), "Code 402 - Payment Required" with maximum hit 1 (0.00%) and "Code 404 - Not Found" with maximum hit 6994 (7.18%).

Table 1: Monthly Statistics for December 2015

Monthly Statistics for December 2015

			Avg	Max		Avg	Max
Total Unique Sites	5978	Hits per Hour	130	756	Code 200 – OK	83.67%	81463
Total Unique URL's	242	Hits per Day	3140	5040	Code 206 – Partial Content	6.05%	5888
Total Unique Referrers	515	Files per Day	2627	4360	Code 304 – Not Modified	3.09%	3012
Total Unique User Agents	1736	Pages per Day	645	895	Code 402 – Payment Required	0.00%	1
		Sites per Day	192	424	Code 404 – Not Found	7.18%	6994
		Visits per Day	214	268			
		Kbytes per Day	496007	2909884			

- **Daily Usage Report:** The daily report provides the information about the number of hits, files, pages, visits, sites and downloads in Kbytes with the percentage of these counters per day. The report is accompanied by a summary graph. The highest number occurred, i.e., hits – 5040, files -4360, sites - 425 on 21st day (Monday), pages – 895 on 1st day (Tuesday), visits - 268 on 28th day (Monday), and downloads in Kbytes – 2909884 on 8th day (Tuesday) of the month. The lowest number occurred, i.e., hits - 1965, files – 1663 on 12th day (Saturday), pages – 307, visits – 154, sites – 202 on 27th day (Sunday) and downloaded in Kbytes – 167948 on 26th day (Saturday). It is interesting fact that the highest occurrence was on Monday's and Tuesday's and lowest occurrence was on Saturday's and Sunday's.



Graph 2: Daily usage for December 2015

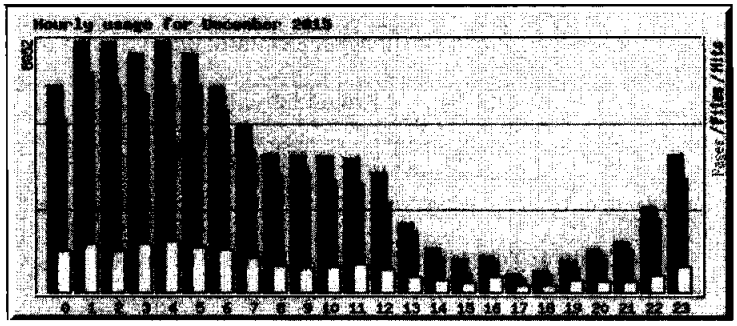
Table 2: Hourly Statistics for December 2015

Hourly Statistics for December 2015

Hour	Hits			Pages								
	Avg	Total		Avg	Total							
0	214	6651	6.83%	179	5553	6.82%	43	1343	6.72%	26744	829078	5.39%
1	259	8052	8.27%	228	7068	8.68%	51	1584	7.92%	35216	1091683	7.10%
2	259	8039	8.26%	213	6603	8.11%	42	1330	6.65%	31266	969252	6.30%
3	246	7634	7.84%	206	6395	7.85%	50	1559	7.80%	34910	1082210	7.04%
4	258	8023	8.24%	213	6615	8.12%	53	1644	8.22%	24199	750166	4.88%
5	246	7629	7.84%	214	6657	8.17%	47	1463	7.32%	23939	742106	4.83%
6	212	6602	6.78%	188	5852	7.18%	44	1386	6.93%	35753	1108338	7.21%
7	172	5346	5.49%	146	4540	5.57%	35	1109	5.55%	29233	906209	5.89%
8	142	4423	4.54%	119	3715	4.56%	27	847	4.24%	20504	635627	4.13%

9	141	4394	4.51%	124	3872	4.75%	24	770	3.85%	21189	656865	4.27%
10	141	4387	4.51%	115	3584	4.40%	26	829	4.15%	34651	1074195	6.99%
11	138	4284	4.40%	111	3471	4.26%	28	879	4.40%	74941	2323182	15.11 %
12	123	3835	3.94%	93	2883	3.54%	23	718	3.59%	28162	873007	5.68%
13	71	2212	2.27%	62	1948	2.39%	16	504	2.52%	10635	329675	2.14%
14	45	1409	1.45%	33	1028	1.26%	11	358	1.79%	6827	211630	1.38%
15	33	1033	1.06%	20	632	0.78%	9	287	1.44%	4216	130711	0.85%
16	36	1124	1.15%	30	933	1.15%	15	477	2.39%	1556	48249	0.31%
17	18	567	0.58%	13	430	0.53%	7	234	1.17%	3808	118054	0.77%
18	22	684	0.70%	17	528	0.65%	7	224	1.12%	2597	80508	0.52%
19	31	980	1.01%	24	755	0.93%	12	387	1.94%	4720	146330	0.95%
20	42	1324	1.36%	34	1056	1.30%	11	345	1.73%	8055	249706	1.62%
21	51	1587	1.63%	43	1347	1.65%	11	352	1.76%	10082	312540	2.03%
22	87	2722	2.80%	75	2352	2.89%	17	537	2.69%	9526	295302	1.92%
23	142	4417	4.54%	117	3646	4.48%	26	831	4.16%	13277	411588	2.68%

- **Hourly Usage Report:** An aggregated hourly report (grouping counters for the same hour of each day together), provides the information about the number of hits, files, pages, visits and downloads in Kbytes with average and percentage of these counters per hour. The report is accompanied by a summary graph. The highest number occurred, i.e., hits – 8052 in 0 hour, files – 7068 and pages – 1584 in 1st hour and downloads in Kbytes – 2323182 in 11th hour. The lowest number occurred, i.e., hits – 567 and files – 430 in 17th hour, Pages – 224 in 18th hour and downloaded in Kbytes – 48249 in 16th hour of the day.



Graph 3: Hourly usage for December 2015

- **Monthly Visit Report of ILA pages visited and downloads:** The table 3 depicts the monthly visit report to ILA website (grouping collected information by URL) provides the information about the number of hits, downloads in Kbytes and URL visited with percentage.

- The highest number URL visited was /Index page (ilaindia.net) with hits – 4907. The table 4 depicts the monthly visit report to ILA website (grouping collected information by URL) provides the information about the number of hits, downloads in Kbytes and URL visited with percentage. The maximum download URL was /7CPC _ILA_School_Lib.pdf with 12101035 KBytes and 4587 hits in the month. These top ten figures are presented out of total visited 242 URL's.

Table 3: Top 10 of 242 Total URL's

Top 10 of 242 Total URL's

Sn	Hits		KBytes		URL
1	4907	5.04%	3011	0.02%	/ilaindia.net
2	4587	4.71%	12101035	78.70%	/7CPC _ILA_School_Lib.pdf
3	2569	2.64%	28938	0.19%	/centre.htm
4	809	0.83%	43040	0.28%	/About Dr. S. R. Ranganathan-ILA.html
5	760	0.78%	187125	1.22%	/ILA-Election-2015.pdf
6	693	0.71%	124819	0.81%	/LIS_Gatway.htm
7	690	0.71%	42863	0.28%	/Images/SR/du03.jpg

8	656	0.67%	32054	0.21%	/Images/SR/sm02.jpg
9	648	0.67%	113186	0.74%	/ILA-membership-form.pdf
10	639	0.66%	50345	0.33%	/Images/SR/sm01.jpg

Table 4: Top 10 of 242 Total URL's By Kbytes

Top 10 of 242 Total URL's By KBytes

Sn	Hits	KBytes	URL
1	4587	4.71%	12101035	78.70%	/7CPC _ILA_School_Lib.pdf
2	760	0.78%	187125	1.22%	/ILA-Election-2015.pdf
3	371	0.38%	155947	1.01%	/Publication/Journal/JourILA.bmp
4	1001	1.03%	140637	0.91%	/Images/SR/SR_4.bmp
5	693	0.71%	124819	0.81%	/LIS-Gateway.htm
6	648	0.67%	113186	0.74%	/ILA-membership-form.pdf
7	2056	2.11%	95574	0.62%	/Images/ILA1.JPG
8	2045	2.10%	85276	0.55%	/Images/earth1.gif
9	63	0.06%	77597	0.50%	/2015_ILA-Conf.pdf
10	2037	2.09%	72866	0.47%	/Images/facebook-logo.jpg

- **Monthly Usage Report of ILA pages By page entry and exit:** The table 5 and 6 depicts the monthly website entry and exit visit report to ILA website (showing most common first and last visit URL's) provides the information about the number of hits, visits, URL's with percentage. The highest number URL visited was /Index page (ilaindia.net) with hits – 4907. However the entry count numbers are more 3471 than the exit count 1638. These top ten figures are presented out of 57 pages /URL's.

Table 5: Top 10 of 57 totals

Top 10 of 57 Total

Sn	Hits		Visits		URL
1	4907	5.04%	3471	53.70%	/ilaindia.net
2	809	0.83%	595	9.20%	/About Dr. S. R. Ranganathan-ILA.html
3	693	0.71%	393	6.08%	/LIS-Gateway.htm
4	2569	2.64%	314	4.86%	/centre.htm
5	2369	2.43%	214	3.31%	/top.htm
6	572	0.59%	160	2.48%	/Membership - ILA.html
7	2343	2.41%	150	2.32%	/left.htm
8	371	0.38%	133	2.06%	/Constitution - ILA.html
9	295	0.30%	86	1.33%	/Office bearers - ILA.html
10	306	0.31%	77	1.19%	/Conference - ILA.html

Table 6: Top 10 of 57 Total Exit Pages

Top 10 of 57 Total Exit Pages

Sn	Hits		Visits		URL
1	4907	5.04%	1638	25.51%	/ilaindia.net
2	2343	2.41%	928	14.45%	/left.htm
3	809	0.83%	620	9.65%	/About Dr. S. R. Ranganathan-ILA.html
4	2569	2.64%	517	8.05%	/centre.htm
5	693	0.71%	405	6.31%	/LIS-Gateway.htm
6	572	0.59%	271	4.22%	/Membership - ILA.html
7	2369	2.43%	235	3.66%	/top.htm
8	371	0.38%	174	2.71%	/Constitution - ILA.html
9	404	0.41%	165	2.57%	/JILA_right.htm
10	382	0.39%	143	2.23%	/About_Us.htm

- **Monthly Usage Report of clients source / referrer and downloads:** The table 7 and 8 depicts the monthly clients source entry and downloads referrer report (grouping the referring IP address/ third-party URL's leading to the analyzed website) provides the information about the number of hits, files, downloads, visits and URL's with percentage. The highest number URL occurred was /google-proxy-66-102-6-166.google.com with hits – 1944, files – 1940and visits - 191. However the highest number URL 45.119.184.241 occurred for downloads in KBytes – 530336 with 43 hits and 43 files. These top ten figures are presented out of 5978 referrers/URL's.

Table 7: Top 10 of 5978 Total Sites

Top 10 of 5978 Total Sites

Sn	Hits		Files		KBytes		Visits		Hostname
1	1944	2.00%	1940	2.38%	66585	0.43%	191	2.87%	google-proxy-66-102-6-166.google.com
2	1932	1.98%	1930	2.37%	68387	0.44%	193	2.90%	google-proxy-66-102-6-174.google.com
3	1924	1.98%	1923	2.36%	70094	0.46%	198	2.98%	google-proxy-66-102-6-170.google.com
4	521	0.54%	465	0.57%	47440	0.31%	16	0.24%	14.139.227.82
5	464	0.48%	328	0.40%	31772	0.21%	7	0.11%	203.190.148.228
6	439	0.45%	388	0.48%	40634	0.26%	13	0.20%	14.139.43.12
7	413	0.42%	172	0.21%	47437	0.31%	120	1.80%	crawl-66-249-64-97.googlebot.com
8	388	0.40%	314	0.39%	13418	0.09%	8	0.12%	ras.beamtele.net
9	375	0.39%	138	0.17%	112619	0.73%	117	1.76%	crawl-66-249-64-107.googlebot.com
10	365	0.37%	363	0.45%	36719	0.24%	0	0.00%	117.198.48.29

Table 8: Top 10 of 5978 Total Sites By Kbytes

Top 10 of 5978 Total Sites By KBytes

Sn	Hits		Files		KBytes		Hostname
1	43	0.04%	43	0.05%	530336	3.45%	45.119.184.241
2	32	0.03%	32	0.04%	363783	2.37%	1-39-37-241.live.vodafone.in
3	46	0.05%	46	0.06%	343286	2.23%	101.222.239.143
4	112	0.12%	112	0.14%	336155	2.19%	223.225.143.171
5	23	0.02%	23	0.03%	303034	1.97%	115.184.53.215
6	21	0.02%	20	0.02%	212347	1.38%	nsg-corporate-94.11.180.122.airtel.in
7	16	0.02%	16	0.02%	192773	1.25%	1-39-50-206.live.vodafone.in
8	12	0.01%	11	0.01%	127551	0.83%	106.215.170.219
9	10	0.01%	10	0.01%	115459	0.75%	125.19.152.118
10	27	0.03%	27	0.03%	112670	0.73%	117.228.62.77

- **The search string / keywords used by a client to reach ILA website:** The table 9 depicts the monthly search strings/**keywords used to locate ILA website** report (grouping items by search terms used in such search engines as Google) provides the information about the keywords used with hits and its percentage. The highest number

string occurred "ila" with hits – 104. The top twenty figures are presented out of total 224 strings used. The keywords / strings have been recorded as it is used by the visitors.

Table 9: Top 20 of 224 Total Search Strings

Top 20 of 224 Total Search Strings

Sn	Hits	Search String	
1	104	22.71%	ila
2	29	6.33%	indian library association
3	11	2.40%	recent activities of indian library association
4	10	2.18%	library association
5	9	1.97%	lis
6	7	1.53%	visit the website of indian library association.ala
7	5	1.09%	indian library associations .its recent activities
8	5	1.09%	library association in india
9	5	1.09%	library in mukherjee nagar
10	5	1.09%	president of indian library association
11	4	0.87%	http://www.ilaindia.net/
12	4	0.87%	visit the website of indian library associstion.ala
13	3	0.66%	chairman of ila
14	3	0.66%	first chairman of ila
15	3	0.66%	ila sites
16	3	0.66%	indian library association conference 2015
17	3	0.66%	indian library association-
18	3	0.66%	library mukherjee nagar
19	3	0.66%	library research circle was founded by
20	3	0.66%	ranganathan commetti

- **Monthly Usage Report of ILA pages by User Agents/browsers:** The table 10 depicts the monthly user agent/browsers report (grouping by the browser type) provides the information about the names of these agent/browsers with hits count and percentage. The highest number agent/browsers occurred "Mozilla/5.0 (Linux; Android 4.2.1; en-us; Nexus 5 Build/JOP40D) AppleWebKit/535.19 (KHTML, like Gecko; googleweblight) Chrome" with 6428 hits. These top ten figures are presented out of total 1736 agent/browsers.

Table 10: Top 10 of 1736 Total User Agents

Top 10 of 1736 Total User Agents

Sn	Hits		User Agent
1	6428	6.60%	Mozilla/5.0 (Linux; Android 4.2.1; en-us; Nexus 5 Build/JOP40D) AppleWebKit/535.19 (KHTML, like Gecko; googleweblight) Chrome
2	6239	6.41%	Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/47.0.2526.106 Safari/537.36
3	3774	3.88%	Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/47.0.2526.80 Safari/537.36
4	3432	3.53%	Mozilla/5.0 (Windows NT 5.1) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/47.0.2526.106 Safari/537.36
5	3347	3.44%	Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/46.0.2490.86 Safari/537.36
6	2848	2.93%	Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/47.0.2526.106 Safari/537.36
7	2736	2.81%	Mozilla/5.0 (Windows NT 6.1; rv:42.0) Gecko/20100101 Firefox/42.0
8	2162	2.22%	Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/47.0.2526.73 Safari/537.36
9	1978	2.03%	Mozilla/5.0 (Windows NT 6.1; rv:43.0) Gecko/20100101 Firefox/43.0
10	1932	1.98%	Mozilla/5.0 (Windows NT 5.1; rv:42.0) Gecko/20100101 Firefox/42.0

- **Monthly Usage Report of ILA pages by country Users :** The table 11 depicts the monthly user country report (grouping by the host's country of origin and also grouped by .com, .net, .org. etc.) provides the information about the names of the country with hits, files and downloads in KBytes and percentage. The highest number country occurred "Unresolved/Unknown" with 57639 hits, 52619 files and 9742937 downloads in Kbytes followed by .com and India. The top thirty figures are presented out of total 67 countries.

Table 11: Top 30 of 67 Total Countries

Top 30 of 67 Total Countries

Sn	Hits	Files	KBytes	Country	Sn	Hits	Files
1	57639	59.20%	52619	64.59%	9742937	63.36%	Unresolved/Unknown
2	15182	15.59%	12627	15.50%	1502294	9.77%	Commercial (com)
3	13504	13.87%	12599	15.47%	3155440	20.52%	India
4	7456	7.66%	6613	8.12%	862611	5.61%	Network (net)
5	545	0.56%	428	0.53%	11479	0.07%	Germany
6	459	0.47%	284	0.35%	223	0.00%	Ukraine
7	314	0.32%	298	0.37%	25959	0.17%	Non-Profit (org)
8	284	0.29%	260	0.32%	7714	0.05%	Romania
9	214	0.22%	134	0.16%	3293	0.02%	European Union
10	210	0.22%	201	0.25%	8213	0.05%	Russian Federation
11	188	0.19%	179	0.22%	4701	0.03%	Pakistan
12	174	0.18%	174	0.21%	610	0.00%	South Africa
13	127	0.13%	109	0.13%	2239	0.01%	Cote D'Ivoire (Ivory Coast)
14	122	0.13%	90	0.11%	1467	0.01%	Switzerland
15	70	0.07%	68	0.08%	942	0.01%	Educational (edu)
16	70	0.07%	59	0.07%	3053	0.02%	Brazil
17	69	0.07%	67	0.08%	3042	0.02%	Mexico
18	63	0.06%	43	0.05%	182	0.00%	Viet Nam
19	55	0.06%	53	0.07%	2845	0.02%	Philippines
20	54	0.06%	53	0.07%	2845	0.02%	Slovenia
21	49	0.05%	28	0.03%	755	0.00%	China
22	40	0.04%	39	0.05%	2301	0.01%	Address Routing (arpa)
23	38	0.04%	36	0.04%	662	0.00%	Australia
24	33	0.03%	17	0.02%	259	0.00%	Sri Lanka
25	31	0.03%	25	0.03%	214	0.00%	Italy
26	28	0.03%	16	0.02%	156	0.00%	France
27	27	0.03%	14	0.02%	821	0.01%	United Kingdom
28	26	0.03%	3	0.00%	37	0.00%	Czech Republic
29	23	0.02%	22	0.03%	530	0.00%	Canada
30	22	0.02%	16	0.02%	323	0.00%	Norway

- **Findings and Conclusion**

This paper highlighted ILA website's consolidated statistics for the year 2015 and aggregated monthly figures from January to December 2015. The one year period study reflected quantitative growth, inconsistent of usage and have many ups and downs of visits and usages. The web performance in terms of evaluating the content, pages and usage are considered as an integral part of web analytics and important in the scientific community of internet / virtual world. The comparison of pages, counts, visitors and country's output in relation to the usage of content has provided a clear picture for understanding the interests and requirements of clients in changing environment. The statistics have been presented in the form of textual, tables and graphs at an appropriate place. For systematically presentation and evaluation, the statistics have been tabulated or graphed wherever it was necessary to display the required results. There are some important facts which have been highlighted under conclusion.

- The overall annual trend indicated that the highest usage occurred during the month of August and lowest usage occurred during the month of May.
- The monthly stats about hits by response code that "Code 200 – OK" has the highest occurrence and "Code 402 - Payment Required" has the lowest occurrence. The occurrence of "Code 404 - Not Found" and "Code 206 - Partial Content" needs urgent attention.
- The daily report revealed that highest usage occurred on Monday's and Tuesday's and lowest usage occurred on Saturday's and Sunday's.
- An aggregated hourly report showed that highest usage occurred in 0 (24^{th}) hour and aggregated lowest usage occurred in 17^{th}, 18^{th} and 16^{th} hour of the day.
- The study also revealed that the highest and lowest figures of visited pages/URL's out of total 242, which shows the usefulness of pages in order.
- The analysis depicted the figure of entry and exit of pages/URL's where total occurrence recorded was 57.
- The report described the figures of visitor's source /referring IP address/ third-party URL's.
- The results of the study have provided the list of keywords/ search strings by which users reached to target website. It also provided the list of browsers/user agent being helped a visitor.
- The country report reflected the highest number visitors from "Unresolved/Unknown" followed by ".com" and "India" out of total 67 countries.

5. Observations and Recommendations

This concept of analyzing the information came along with the conceptualization of www, internet and websites. It is a new concept which can to be applied to scale the web information in diversified spectrum. As we know that internet is an instant source of unlimited information but when we look at the results, we find a very long list of sources. It is very difficult to identify the right, precise and authentic information from a large number of results displayed. The search engines, i.e., Google, Yahoo, etc. are applying variety of techniques, i.e., ontology-based information retrieval system, notion of domain ontology-based lexical chain, automatic classification and mapping of documents and web crawler based indexing systems. But, a user is still not able to acquire the precise and authentic information in a right form from the internet.

- The count of ILA website usage is as hits, files, pages, sites, hosts and visits, as well as daily averages of these counters for each month during the period of study. It has been noticed that when a HTTP requests to a non-existent content, that failed request for the missing content is also counted as a hit and consequently, the hit rate increased without any usage. Another reverse fact noticed that when a visitor submit more than one request within a stipulated timeout period, only first time request for the page is counted and repeated requests for the same page is not counted.
- The actual usage statistics of pages that are already in the browsers cache is not clear. Whether recorded on each actual request or content already in browsers cache is used and fresh figure is not counted.
- The response code report is very important and an especial attention on Code 404 - Not Found" and "Code 206 - Partial Content" has to be paid. It may require more bandwidth to avoid the traffic from various sources. When a previous content not found or partially found on the page, it leads to code 206. Therefore, frequently and major changes in content page should be avoided.
- The highest usage occurred on Monday's and Tuesday's and lowest usage occurred on Saturday's and Sunday's as revealed in daily report, therefore, it should be insured that the website should be perfectly work especially on Monday's and Tuesday's.
- Based on aggregated hourly facts, we should put more focus on highest usage hours and improve the visibility of web pages in lowest usage hours.
- The study also revealed that the highest and lowest figures of visited pages of the website. The content has the most important and should be focused on creating content primarily for users. The index page of the website has been designed in three frames, i.e., top consist image as header, right consist links to pages and the center frame consist the content for display. All content pages opens in mainframe and the address of that particular content page is not displayed in the browser path. The visibility of respective content pages path is lost, therefore, it is suggested that the website should be designed in such a way which allows the path display in browser and when content pages opens in blank page should carry the links as well.

- The publication content, i.e., Journal of ILA and ILA Newsletter have been made available on other website which has been developed in wordpress.com. The majority of the visitors to ILA website are for aforementioned publications, consequently, the usage to these publications have not been recorded, hence, these publications should be integrated with the main portal to record their usage.
- The entry page of website reflected the interest of a visitor which needs to pay more honor to that particular pages.
- The visitor source / referrer /third-party URL's data figures out the search engine names, therefore, the website should be registered with search indexing crawlers /search engines, i.e., Google analytics and website optimizer
- The report on keywords/ search strings forces us to use proper and relevant keywords coding in specified meta name and content tags to keep in mind the users input words.
- The behaviors of browsers/user agent need to be studied and compatibility features should be aligned with web development programming. The visitors should be updated about the best version and other options including security features.
- The country report displayed a mixed result which includes "Unresolved/Unknown", "dot com", "dot.net", "dot org" and country name, etc. The Webalizer should produce the data separately for country and other domains. It is fact that a huge percentile has been shown as Unresolved/Unknown, because of access through dialup and other customer points which does not identify the country but recognize an IP address only. Another fact is that dot IN domain actually represents India, but it may be located elsewhere. Therefore, the software must be developed to produce realistic figures by avoiding the term "Unresolved/Unknown", "dot com", "dot.net", "dot org" under the country report.
- The result reflects usage from 67 visitor countries only; an appropriate effort should be made to reach rest of the countries.
- The Webalizer does not identify the human visitors and robots; therefore, it records the figures as on occurrence basis. Accordingly, the recorded metrics are more than those due to people alone. It is unable to record the data of dynamic pages because, it does not analyse the query string. It is assumed that the statistics recorded by Webalizer are unrealistic figures.
- The search result from government, country domain, research organisation, academic and educational, commercial and networks, etc. should be filtered and presented as per researcher's parameters separately.
- It has been observed that urgent and acute developments in search technology, indexing practices, intelligent classification, systematic relevance of content, differentiation of hosts and filtering of content should be carried out by the leading search engines.
- For better indexing and visibility, we should focus on little but important aspects, i.e., SEO technique; create unique and appropriate title pages and tags for each page, create a naturally flowing hierarchy, use mostly text for navigation, put an HTML site map

page on the site, and use an XML and image sitemap file, accurately summarize and describe the page's content, use brief, but descriptive titles, filenames and alt text, relevant naming to images and figures, make use of the "description" meta tag, use unique descriptions for each page, improve the structure of URL's, make site easier to navigate, offer quality content and services, write better anchor text and effective use of robots.txt, optimize use of images, and use heading tags appropriately, etc.

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Apendix-1 : Commonly used terminology and definitions for website traffic analysis:

- **Countries** are determined based on the top level domain of the requesting site. The domains, i.e., dot com, dot net, dot org, dot edu, etc., included but not described to which country.
- **Entry** pages are those pages that are the first requested by a visitor. When a first requested is triggered to a page that is counted as an entry page.

- **Exit** pages are those pages that are the last requested by a visitor. The last requested page is counted as an exit page.
- **KByte** (KB) is 1024 bytes (1 Kilobyte) is being used to reflect the data amount that is transferred between the server and the remote machine, based on the data found in the server log.
- **Hit** - The request of browser to HTTP is counted as one hit.
- **Files** Each successful HTTP request is counted as a file.
- **Host** is the visitor's machine running the browser which is identified by IP addresses or domain names.
- **Pages** are those URL's which are considered as actual requested page and usually identified by a file extension .htm, .html or .cgi. php, .asp, etc.
- **Referrers** are the URL's which directs a user to the site.
- **Search Strings** are the keywords input by a visitor to find the required content URL.
- **Site** is a remote machine/IP Address/Hostname that makes requests to the server.
- **URL** - Uniquely identifies the resource requested by the visitor's browser.
- **User Agent** is the web browser.
- **Visit:** is a request for a page on the server for the first time.
- **Visitor** is the actual person / machine browsing the website.

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Awareness and Management of E-resources among P G Student and Research Scholars of the University of Rajasthan: *A Case study*

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Abstract: - The role of e-resources is increasing day by day now in the libraries. We can deliver more satisfaction to the users in library through using e-resources. Recent studies investigate on Management, awareness and interest of e-resources by the P G Students and research Scholars University of Rajasthan, Jaipur. The study also identifies the challenges faced by respondents while using the digital or e- resources. In this paper we also suggest some necessary recommendation for the use and awareness of e-resources. The questionnaire method adopted for the study. Total 200 questionnaires distributed to PG students and research scholars. 90% questionnaire back received. The result has presented by tables.

Keywords: Management, Awareness, E-resources university of Rajasthan.

1. Introduction

Electronics resource is a source of information that provides access to library in an electronic format. The library has purchased subscription of many electronic information resources to provide users a hassle free access without any charge. E-resources are a seamless blend of the conventional archive of current or historically important information and knowledge, along with ephemeral martial such a draft notes, memoranda and files of ongoing activity, we can say for e-resources that any work to do in coded and made available for access through the use of a computer which includes e-data available by remote access and even direct access. The E-resource may be stored locally or access remotely via computer networks.

2. Objective of the study

- To find awareness of e-resources among the students of university of Rajasthan.
- Find out the satisfaction level of students and research scholars with e-resources.
- To know the kind of material accessed the e-resources.
- To know the purpose and use of e-resources among the students and research scholars.

- To provide suggestion based on the present study.

3. Research Methodology

To collect the data, a well structured questionnaire was designed with questions like computer skills, frequency of use, purpose of use, problems in use, satisfaction with e-resources, performance of library etc. in the satisfaction of PG and research scholars. These questionnaires are distributed individually by author to students and research scholars of university of Rajasthan, Jaipur. Total 200 questionnaires distributed to PG students and research scholars. Out of 200, 180 (90%) back received. 16 questionnaires were rejected due to without sufficient information. Finally 164 questionnaires were taken for data analysis. The data analyses with help of excel and the result has presented by tables.

4. Limitation of the study

The present study is limited to the P.G students and research scholar of University of Rajasthan, Jaipur only. The study is not related to other colleges/ universities or institution at Jaipur (Rajasthan).

5. Data analysis and interpretation

It has been observed that e-resources are very important of the library users. The knowledge of use of e-resources and awareness should have to student and research & scholars. The Main scope of the study is confines to focus on knowledge, Management, awareness of e-resources among students and research scholars. The study includes students of various departments like humanities, science, management, commerce are studying in different schools of University of Rajasthan. Total 160 questionnaire intended by author for the study-

Table 1: Gender wise and student wise distribution of respondents

Sl. No.	Gender	P.G. Students	Research Scholars	Percentage
1	Male	90	32	122 (100%)
2	Female	32	10	42 (100%)
Total	122	42	164 (100%)	

Above table No.1 shows the gender and student wise distributions of respondents. Total 164 respondents were included in the study. The numbers of male respondents were 122 then the female counter part 42 respondents. As per class wise classification of respondents, P.G. students 90 and research scholars were 32; female PG students 32 and research scholars were 10.

Table 2: Awareness of E-resources and use

S.NO.	Respondent's response	PG Students	Research Scholars
1	Aware & Use	31 (25.4%)	9 (21.42%)
2	Aware but never use	75 (61.48%)	23 (54.77%)
3	Not aware	16 (13.12%)	10 (23.81%)
	Total	122 (100%)	42 (100)

The reveals from the data of above Table 2 shows that majority of PG students 31 (25.4%) and 9 (21.42%) research scholars are aware and use of e-resources in the library. Highest 75 (61.48%) PG students and 23 (54.77%) research scholars are aware but never use with e-resources. Not aware 13.12% and 23.81% students. Result shows that most of students and research scholars are aware with e-resources.

Table 3: Frequency of Library visit

S. No.	Frequency	P.G. Students	Research scholars
1	Daily	68 (55.74%)	27 (64.28%)
2	Three Times in a week	9 (7.38%)	6 (14.28%)
3	Once in month	38 (31.15%)	7 (16.66%)
4	Occasionally	7 (5.73%)	2 (4.75%)
Total	122 (100%)	42 (100%)	

Table 3 indicates the frequency to visit by the PG students and research scholars. Out of 122 (55.74%) PG students and out of 42, 64.28% research scholars have visited daily to library. 7.38 % PG students and 14.28 % research scholars have visited 3 times in a week.

Table 4: Purpose of using e-resources

S. No.	Purpose	P.G. students	Research Scholars
1	Education	42 (34.42%)	7 (16.66%)
2	Research	55 (45.08%)	19 (45.24%)
3	Presentation	17 (13.94%)	11 (26.20%)
4	Unknown about e-resource	8 (6.56%)	5 (11.90%)
Total	122 (100%)	42 (100%)	

Above table 4 shows the purpose of using e-resources among P.G. students and research scholars of the library. Out of 122 P.G. students, highest 55 (45.08%) and out of 42, highest 19 (45.24%) research scholars were using e-resources for research purpose. 34.42% PG students for education, 13.94% were for presentation as well as 11 (26.20)% Research scholars for presentation, 7 (16.66%) for education purpose used of e-resources. 6.56% and 11.90% were unknown about e-resources.

Table 5: Search any online catalogue

S. No.	Response	P.G. Students	Research Scholars
1	Yes	83 (68.03%)	32 (6.19%)
2	No	39 (31.97%)	10 (23.81%)
Total	122 (100%)	42 (100%)	

As we can see in table 5, Search any online catalogue. As the result of the study, that how many respondents were ever used online catalogue. As per above table 68.03% P.G. students and 76.19% research scholars have used online catalogue.

The table no. 6 shows that the library is a highest access point to use e-resources among the respondents. As per the result 57.37% of P.G. students and 66.66% research scholars were use e-resources at the library but another 19.67% on their mobile, 14.76% by laptops and 8.20% at cybercafé. 21.43% research scholars by their mobile, 9.52% laptop and only 2.39% were used at cyber café.

Table-6 Access point of e-resources

S. No.	Access Point	P.G. Student	Research Scholars
1	Library	70 (57.37%)	28 (66.66%)
2	Mobile	24 (19.67%)	9 (21.43%)
3	Laptop	18 (14.76%)	4 (9.52%)
4	Cybercafe	10 (8.20%)	1 (2.39%)
	Total	122 (100%)	42 (100%)

Table 7: Problems while using digital resources

S. No.	Reasons	.G.Students	Research Scholars
1	Not known about proper down loading	52 (42.62%)	17 (40.48%)
2	Not sufficiently familiars with digital resources	27 (22.13%)	9 (21.43%)
3	My desired material is not available	18 (14.76%)	11 (26.19%)
4	Doubt about the originality of the document	14 (11.48%)	3 (7.14%)
5	Difficulty to save/read from computer screen	11 (9.01%)	2 (4.76%)
	Total	122 (100%)	42 (100%)

Table 7 presents problems facing by respondents while using digital resources. 52 (42.62%) P.G. students have not any knowledge about proper downloading the digital/e-resources further 27 (22.13%) have not sufficiently familiar with the e-resources, 14.76% have not found their desired material and 9.01% felt difficulties to save or read from computer's screen. As same, 40.48% of research scholars have not knowledge about proper downloading, 7.14% thought that material is not genuine.

Table 8: Satisfaction with e-resources

S. No.	Level of satisfaction	P.G.Student	Research
1	Fully satisfied	76 (62.29%)	29 (69.4%)
2	Partially satisfy	26 (21.31%)	8 (19.05%)
3	Least satisfied	17 (13.94%)	2 (4.76%)
4	Not Satisfied	3 (02.46%)	3 (07.15)
	Total	122 (100%)	42 (100%)

Table-8 Reveals the satisfaction level of the respondents with e-resources. 62.29% P.G. students and 69.04% research scholars have fully satisfied while 21.31% P.G. students partially. Out of 160, only 6 respondents have not satisfied with e-resources in the library. As per results of the study, it shows that the university are provides a good quality e-resource facility for there students and research scholars. It is also seemed that there are highest satisfied respondents, 62.29% among P.G. students and 69.04% among research scholars.

6. Major findings of the Study

- 61.48% respondents of P.G. students and 54.77% research scholars aware with e-resources but they never use it.
- 55.74% P.G. students and 64.28% Research scholars have visited daily to the library.
- 45.08% P.G. students and 45.24% research scholars have used e-resources for research purpose.
- 68.03% respondents search online catalogue while 76.19% research scholars search online catalogue.
- The library is the main access point for 57.37% P.G. Students and 66.66% research scholars.
- 42.62% P.G. students and 40.48% of research scholars have not got any knowledge of proper downloading about e-resources.
- Majority (62.29%) of P.G. students and 69.04% of research scholars were fully satisfied with e-resources.
- 25.4% of P.G. Students and 21.42% research scholars have aware how to use e-resources.
- Most of the respondents were accessing e-resources at library.
- The library of university of Rajasthan has rich collection of e-journals/e-resources.

7. Suggestions

After the result of the study, based on the finding, following suggestions should be made for further improvement.

- An orientation work should be done for every P.G. students and research scholar when they admitted in first time or enrollment for the library facility for the awareness and proper using of e-resources.
- An awareness programs about e-resources/digital resources can also be start for students, so that they should aware of e-resources.
- In the library, basic facilities should provide for users.
- Library staff should also be well qualified to fulfill users need related to digital resources.
- Library and librarian should make a suitable environment for use/access/print/save/mail of e-resources.
- The university should also add an information Technology subject in the syllabus of every students, so that they should have basic knowledge of IT.

- The study shows that many students have not knowledge of downloading, so university should arrange a training program for every user for user-friendly access.
- University library should increase the collection of e-resources.
- Time of digital library should be extended or it may be opened 24x7.
- No. of PCs should increase immediately in library so that users can research e-resources without lost time.

8. Conclusion

The study examined many and awareness of e-resources among the P.G. students and research scholars of the university of Rajasthan. Mostly responding are pursuing Post graduate and research scholars (pursuing M.Phil or Ph.D.) of various departments/ scholars of the university. Looking at the finding of this study it can be analyze that most of students were not prepared to 10 use e-resources/digital resources. Most of them were not aware of e-resources and must of them not never use. Today also most of students don't want to use digital resources due to unaware or low interest in digital materials. Most of the students have confidence to printed materials also. So it is need that library should have sufficient infrastructure and knowledge of users need so every student can approach to digital or e-resources. The present study clearly shows the clear picture of actual use/ unused of e-resources and various reason of not reaching to e-resources.

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Copyright Issues on Electronic Resources

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Abstract: The copyright issues are an invisible and intangible intellectual Property rights. The copyright represents the fruit of an individual's effort of an intellectual creativity as an asset. This IPR recognized as the property like an immovable property, which can be mortgaged, sold, rented sold and passed the property rights on to their heirs and successors. The present study on copy right issues on electronic resources is limited to few selected areas, viz., the Electronic Copyright Management Systems (ECMS) and Importance of Copy Right Act etc., the researcher made an attempt to identify the areas of Copy Right violations against the Electronic Resources and application of fair deal and fair use. and copyrights of multimedia are discussed in this paper.

Keywords: Copyright, E-resources

1. Introduction

The copyright Act which brings the Property rights emanating from the activities and practices of the human intellect. The human intellect recognized as the intellectual property like an immovable property, which can be mortgaged, sold, rented sold, and passed on to their heirs and successors of the property. Intellectual Property represents the fruit of an individual's effort of intellectual creativity. As in the case of immovable property, the owner has every right to prevent other from making use of this property without permission. If the owner identifies the infringement of rights, legal notice can be sued for the damages at the court of law. The copy right Laws fair deal and fail use and copy right Electronic Resources are come under the Intellectual property rights. The historical background traced the formation of patent law first in Italy, during 15th century. In the year 1624 , in England during Elizabeth-I, the executive rights were created are 'Uniform Monopolies' In the United States, the Massachusetts Bay Colony passed as early as 1672. In British India the first patent right granted in the year 1856 to George Alfred De Penning for invention of "An efficient Pankha Pulling Machine" for a period of 14 years. The compressive legal protection for Intellectual Property Rights (IPR) was first addressed in treaties beginning in the late 19th century. And the Berne Convention of 1886 protected artistic and literary works among the member countries. Through the Berne Convention, many international treaties addressed Intellectual Property Rights (IPR) based in Geneva, Switzerland, administers some of these treaties. In this article an attempts has been made to discuss the area viz. IPR and the issues i) Copyright Laws: ii) International Treaties; iii) Fair dealing and Fair use and iv) Copyright in Electronic Resources

2. Objectives of the study

- To examine the importance of copyright Act in the Electronic Age
- To identify, to what extent the copy right Act will help in the information management in the libraries and information centres

- To What extent the copyright will help in the library functions in handling the Electronic sources.

3. Methodology

This study is a theoretical and descriptive, based on the latest reviews of literature, on the selected areas of intellectual property rights. The primary and secondary sources are consulted to trace the various form of IPR, with regards to print materials, Non-book materials, special materials and electronic sources; its importance in the management of information was analyzed to create awareness among the library professional. The theories like fair dealing/ fair use, electronic copy right and its application to the electronic resource in the library are discussed in this paper.

4. Limitations of Present Study

The present study on Copyright issues on Electronic Resources is limited to few selected areas, viz., the international treaties, data base the internet and Copyright Multimedia and Copy right and the Electronic Copyright Management Systems (ECMS) etc., and the basic areas under Copy right, were also comprehensively discussed in this paper.

5. Analysis

- **Internet and Copyright:** In the internet the e-mail message are loaded on to World Wide Web services and put on internet are treated under copyright. These are a widely available site which are free of charge, does not change the situation and most authors of such materials are happy for their materials to be produced and disseminated and this material is still under copyright. But here the application of copyright is a problem- if the person losses income as a result of infringement, then the concern may be sued. Internet URLs e-mail addresses are protected by copyright just as they are internet indexes such as those created by Yahoo! And FAQ collections on Usenet newsgroups.
- **Fair dealing/ fair use:** The most importance one is 'fair dealing' in the United Kingdom and the same concept in the United States termed as 'fair use.' One can use fair dealing as a defence if the copying was for one of the purpose specified in the local legislation or national legislation, will permit to use in the case of research academic study criticism and book reviewing reporting current events; educational purpose. Fair dealing applies to books, journals, and databases, etc, there is a misconception that fair dealing does not apply to electronic databases.
- **Reproduction Rights Organizations (RROs) :** There are bodies owned by publisher's representatives that have the authority to issue blanket licenses to organizations so that they may photocopy copyrights materials. A licensing scheme, that allows you to do things normally which are not permitted. An RRO license gives you permission to copy all, publisher's materials which are under this RRO agreement. The RRO will provide a list of those publishers who refuse to be part of the scheme. The RRO have the authority to negotiate electronic copying rights

- **International Treaties:** Copyright law is subject to international treaties and the Berne Convention and the Universal Copyright is one of the important developments. These agreements allow the countries that are partly to the particular treaty, for reciprocals protection for nationals form different countries. The crucial factor, as established by these convections, is not where the materials was created, but where the alleged infringement was created, but where the alleged infringement took place E.g. If a foreign work was illegally used in the United Kingdom, the infringer will be sued and punished in accordance with British Copyright Act. Similarly if anybody downloads in the United Kingdom data held on a computer in the United States, then it is British law that applies, not American. In an internationally networked environment raise number of problems; if I in the United Kingdom, send instructions to a computer in the United States to copy a large body of machine readable data to a computer in Argentina let us imagine that by all reasonable tests in British and American law, I have infringed, but there is no infringement in Argentinean law. This is the reason the copyright laws may have change from country to country, thus misuses the copyright.
- **Design:** Features of shape configuration pattern or ornament applied to any article by any industrial process whether manual mechanical or chemical which in the finished article appealed to and are judged solely by the eye but does not include any mode or principle of construction, or anything which in substance a mere mechanical device or Trademark or property mark.
- **Trade Mark:** Trade Mark is a registered Trade Mark or a Mark used in goods indicating this connection in the course of trade between goods and proprietor of the mark. Trade Mark used or proposed to be used in goods indicating the connection in course of trade between goods and proprietor of the mark or Registered user to use the mark without identify of that person includes certification trade mark, which includes; device brand, heading, label, ticket, name, signature, word, letter, numerals or combination thereof.
- **The Patents:** The patent law ensured that those who incur the cost invention will reap its reward, if users find the result worth paying for. The patent 'system is designed to stop' the "Free riding" by non- patentees, so that the profit incentives system may operative in the interest of the patentees and in the interest of consumers.
- **Databases:** The databases are also come under the purview of copy right laws as it involved in articulation and designing of the data, and retrieval of information are data involved with a creative intellectual and literally thoughts. Hence the databases are also concerned under copyright laws, whether comprising words or numbers, compilations.' A National law defines compilation under the same ground rule i.e. the author must have made intellectual efforts by collection, selecting, and arranging its content and, therefore, created something that is original, will attract copyright. There is an implication if there is no skill in the arrangement in such a compilation should not justify copyright protection. These factors should apply just as much to print products is also to electronic products.

- **Multimedia and Copyright:** In multimedia all different items are put together into a single product as multimedia which also attached to copyright Act. The multimedia split the subject area between the different forms of media and bundled. The literary- still images artistic moving images, spoken word, sound-recording and Musical works have had their own copyright. But the copyright Act is varied its position and treatment from country to country and the RRO also played an important role in providing the privilege of copying the multimedia items. There are number of problems particularly in the contexts of multimedia use differ from country to country.

6. Conclusion

The library professional should pay keen interest to understand the various provisions about the copyright act, patterns and designs etc. The liabilities and safeguards in regards to the librarians and libraries should be take note of it, to avoid the infringement of the copyright act. The author felt, that the library associations must taken up the topics of IPR to educate and refresh the library professional so that the library professions have had some knowledge, how to maintain and handle the electronic and digital sources in the libraries. This paper made an attempt to present a view about various problems of IPR in handling the digital and electronic sources in the libraries. Special care should be taken while handling the sources to avoid the Piracy and tampering of the data during recording and repacking information into floppies, tapes and CDs etc. The knowledge about the copyright will create legitimate opportunity to carry out the various forms of reprographic activities in the libraries without infringement of rights of the author.

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COPYRIGHT VIOLATION OF CULTURAL RESOURCES: CURRENT SCENARIO

O. N CHAUBEY

INTRODUCTION

Intellectual Property is the creation of human intellect and submits it through any form either conventional or non-conventional for the greater academic interest. A statutory rights to reward the creators, inventors or the owners of IP.Copyright is designed primarily to protect an artist, publisher, or other owner including intangible property like patents, trademarks and trade secrets, collectively referred to as "intellectual property. Protects against any unauthorized copying of the work of any type by reproducing the work in any form, publishing, performing in public, filming, broadcasting and intangible cultural heritage. IPR is country's right where as Copyright is universal

Tangible vs Intangible Rights

Intangible Rights, also known as incorporeal Right, describes something which a person or corporation can have ownership of and can transfer ownership to another person or corporation It has no physical substance. It generally refers to statutory creations such as copyright, trademarks, patents, cultural heritages etc.

CULTURAL RESOURCES

Cultural resources are the heritages which are original by nature and the sense denote to the term of legacy of physical artefacts which is man-made object as a whole and these intangible attributes move from generation to generation, including customs, practices, places, objects, artistic expressions and values.

Types of Cultural Resources

TANGIBLE

1. Historical, cultural and scientific value which are invariably preserved in memory, documentation, teaching etc

2. Products comprises language, writing, works of literature, art, science, oral tradition, folklore, ways of life, lifestyles, festivals, secrets of traditional handicrafts, traditional knowledge on medicine, agriculture, cuisine, ethnic costumes and other forms of traditional knowledge

INTANGIBLE

1. Comprises of material products with historical, cultural and scientific value including historical cultural sites, scenic landscapes, relics, antiquities and national treasures

2. Historical cultural sites consists monuments and locales i.e, the scene of any event or action, the scenic landscapes denote to the sense of spots surrounded with natural exquisiteness and sites comprising of both natural beauty and architectural historical monuments having aesthetic and scientific value.

Copyrights of Cultural Resources

Copyright is a right, which is available for creating an original literary or dramatic or musical or artistic work. European Union Commission promulgated copyright rules in view of modernization and creating digital market. European, one of the largest networks comprises cultural heritage institutions and professionals across Europe and more than 1700 members and 3500 data providers have joined together to bring success to this mission. UNESCO also articulated such rights to promote individual creativity. UNESCO through Universal Copyright Convention, 1952 framed Global Alliance for Cultural Diversity to check piracy but promoted to use such resources for gaining knowledge and research. Cultural Institutions (CICI), a non-profit organization constituting 11 cultural institutions of Australia perform as a network group for copyright and intellectual property managers of the cultural institutions.The Aboriginal and Torres Strait Islander Arts Board, Australia has formulated five protocols in the areas of a) New Media Cultures, b) Visual Cultures, c) Performing Cultures, d) Song Cultures and e) Writing Cultures for information and advice. Copyright of the cultural resources are covered under the legal framework.UNESCO promulgated laws on cultural heritage Article 5 lays down the provision of unified management of cultural heritage. Article 6 covers the provision of inclusion of cultural heritage available under the mainland, islands within the control of the state, territorial water etc. Copyright of such heritages is regulated according to law, civil code and other provisions of law in case of any infringement. MHRD, Govt. of India, in 1999 revealed that, India remained a powerful force in the field of copyright as it is rich in cultural heritages and the activities prevalent come under the subject of copyright.

The Copyright Act empowers the copyright holders many activities such as,

- Reproduce the work in material form;
- Publish the work;
- Perform the work in public or communicate to the public;
- Produce, reproduce, perform or publish any translation of the work;
- Make cinematographic film or a record of the work;

- Make any adaption of the work etc.

Copyright of Cultural Heritage- Indian Perspective

- Initiated in 1847
- Promulgation of Copyright Act in 1911 in England automatically extended to Indian soil due to British rule and the Act was in vogue till 1957.
- The Copyright Act, 1957 amended in 1983, 1984, 1992, 1994 1999, 2012 governs the copyright protection in India
- The total term of protection for literary work is the author's life plus sixty years
- For cinematographic films, records, photographs, posthumous publications, anonymous publication, works of government and international agencies the term is 60 years from the beginning of the calendar year following the year in which the work was published
- Copyright (Amendment) Act, 2012 in India came into force w.e.f. 21.6.2015 provides legal machinery in two ways i.e, (i) Copyright Board (A quasi-judicial body) and (ii) Court.
- For broadcasting, the term is 25 years from the beginning of the calendar year following the year in which the broadcast was made.
- Copyright gives protection for the expression of an idea and not for the idea itself.
- For example, many authors write textbooks on physics covering various aspects like mechanics, heat, optics etc. Even though these topics are covered in several books by different authors, each author will have a copyright on the book written by him / her, provided the book is not a copy of some other book published earlier.
- The moment an original work is created, the creator starts enjoying the copyright
- When a work is published with the authority of the copyright owner, a notice of copyright may be placed on publicly distributed copies.
- Violation of copyright is a cognizable offence.
- Computer program in the Copyright Act has been defined as a set of instructions expressed in words, codes, schemes or any other form, including a machine-readable medium, capable of causing a computer to perform a particular task or achieve a particular result.
- In the digital era, copyright is assuming a new importance as many works transacted through networks such as databases, multi media work, music, information etc. are presently the subject matter of copyright.

- To secure copyright protection, the work in question must be an original work of authorship fixed in a tangible medium of expression.

Authorship include,

- Literary works (including computer programs);
- Musical works and accompanying lyrics;
- Dramatic works and dialogue;
- Pantomimes and choreographic works;
- Pictorial, graphic, and sculptural works;
- Motion pictures and other audiovisual works; and
- Sound recordings

Highlights of Copyright (Amendment) Act, 2012

- Section 21 of the Copyright Act, which deals with the right of authors to relinquish copyright, has been amended.
- Section 30 of the Act, which required licences to be in writing and signed, now only requires in writing.
- Section 31 compulsory licence in works withheld from public.
- Section 31A provides compulsory licence in unpublished Indian works.
- The Compulsory Licensing Now Applies to Foreign Works is now applied to all works, whether Indian or foreign both published and unpublished
- Section 52(1)(b) allows for "the transient or incidental storage of a work or performance purely in the technical process of electronic transmission or communication to the public", hence applying primarily to Internet Service Providers (ISPs), VPN providers, etc.
- Section 52(1)(c) allows for "transient or incidental storage of a work or performance for the purpose of providing electronic links, access or integration, where such links, access or integration has not been expressly prohibited by the right holder, unless the person responsible is aware or has reasonable grounds for believing that such storage is of an infringing copy.
- This seems to make it applicable primarily to search engines, with other kinds of online services being covered or not covered depending on one's interpretation of the word 'incidental

- The Digital locks are now provided with legal protection without accountability.
- The Technological Protection Measures (TPM) and Rights Management Information (RMI) are 'digital locks' also known as Digital Rights Management (DRM). Three new Sections -2(xa), 65A and 65B deal with DRM.
- Section 65A criminalises the circumvention of an effective technological protection measure.
- Section 65B not only criminalises certain acts relating to Right Management Information (RMI) but also states that rights owners would be entitled to avail of certain civil remedies.
- Section 2(xa) defines RMI to mean the title or other information identifying a work or performance, the name of the author or performer, the name and address of the owner of rights, terms and conditions regarding the use of the rights, and any number or code that represents this information.

Term of Copyright for Photographs

- The term of copyright for photographs has now gone from sixty years from publication to sixty years from the death of the photographer.
- This means that copyright in a photograph clicked in 2012 by a 20 year old who dies at the 80 will only expire on January 1, 2133.
- This applies not only to artistic photographs, but also to all photographs because copyright is an opt-out system, not an opt-in system. Quite obviously, most photo shopping is illegal under copyright law.

Removal of Parallel Importation

- The Copyright Act only prohibits import of infringing copies of a work, and a copy of a book that has been legally sold in a foreign country is not an "infringing copy".
- The government was set to introduce a provision making it clear that parallel importation was allowed. The Parliamentary Standing Committee heard objections to this proposal from a foreign publishers' association, but decided to recommend the retention of the clause. Still, due to pressure from a few publishing companies whose business relies on monopolies over importation of works into India, the government has decided to delete the provisio

Expansion of Moral Rights without Safeguards

- Changes have been made to author's moral rights (and performer's moral rights have been introduced) but these have been made without adequate safeguards.

- The changes might allow the legal heir of an author, artist, etc., to object to 'distortion, mutilation, modification, or other act' of her ancestors work even when the ancestor might not have.
- By this amendment, this right continues in perpetuity, even after the original creator dies and even after the work enters into the public domain.
- It seems Indian policymakers had not heard of Stephen Joyce, the grandson of James Joyce, who has "brought numerous lawsuits or threats of legal action against scholars, biographers and artists attempting to quote from Joyce's literary work or personal correspondence

Global Scenario of copyright violation

- 179 university professors from some 110 universities in South Korea were indicted on for an extensive criminal investigation into a huge copyright scam.
- Charged with rrepublishing existing textbooks written by others under their own names by modifying the covers with the alleged connivance of the publishing companies.
- 74 professors were indicted without detention and 105 were summarily indicted or subject to fines without a formal hearing, according to the documents issued on 14 December by the fifth criminal department of Uijeongbu District Prosecutors' Office.
- 82 fake authors and 23 authors who cooperated in the process were summarily indicted with fines ranging from KRW3 million (US$2,540) to KRW10 million (US$8,500).
- Korea's copyright protection laws, copyright infringement cases can result in a sentence of up to five years' imprisonment and up to 50 million won in fines. Source: University World News, 29.2.2016, Issue No. 00402, (http://www.universityworldnews.com/article.php?story=20151217055951725) (Accessed on 29.2.2016)

Copyright Cases in India

- In general level, "plagiarism" is an academic term, while "copyright infringement" is a legal term.
- There are multiple cases of violation of copyright not only in the academic domain but also in many areas including cultural resources and multiple cases have been under trial in different high courts, central government and other courts.

Copyright Infringement

- Two types of Infringement

- Primary (deals with the real act of copying)
- Secondary (deals with other kinds of dealing like selling the pirated books, importing etc.)

- The remedies for copyright infringement are:

a) Civil

b) Criminal, and

c) Administrative

Civil Remedies

1) INTERLOCUTORY INJUCTIONS: Grant of interim injunction, namely,

a) Prima facie case

b) Balance of Convenience; and

c) Irreparable injury

2) PECUNIARY REMEDIES: Under Indian law, the plaintiff, under sections 55 and 58, can seek recovery of all three remedies, namely **(a) account of profits (b) compensatory damages and (c) conversion damages** which are assessed on the basis of value of the article converted.

3) ANTON PILLER ORDERS: The Anton Pillar Order has the following elements:

a) **An injunction** restraining the defendant from dealing in the infringing goods or destroying, them;

b) An order that the plaintiffs solicitors be permitted to enter the premises of the defendants, search the same and take goods in their safe custody; and

c) An order that defendant be directed to disclose the names and addresses of suppliers and customers and also to file an affidavit will a specified time giving this information.

4) MAREVA INJUNCTION: Mareva Injunction is an order which temporarily freezes assets of a defendant thus preventing the defendant from frustrating the judgement by disposal of such assets

CRIMINAL REMEDIES:

Criminal remedies for copyright violation include:

I. Punishment through imprisonment which, under Indian law, may not be less than six months but which may extend to three years;

II. Fines which, under Indian law, shall not be less than Rs.50.000. and which may extend to Rs.200, 000.

III. Search and seizure of the infringing goods including plates which are defined as including blocks, moulds, transfers, negatives, duplicating equipment or any other device used or intended to be used for printing or reproducing copies of the work.

IV. Delivery up of infringing copies or plates to the owner of the copyright

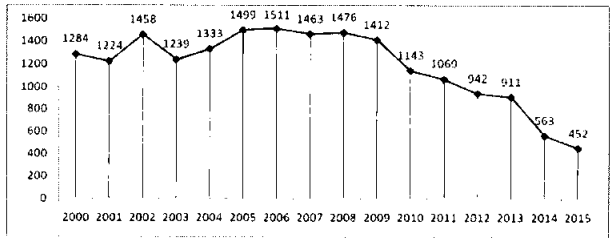
Source: http://lawmantra.co.in/infringement-of-copyright/

Table-1: Copyright cases in India

Year	No. of cases	% of Violation
2000	1284	6.76
2001	1224	6.44
2002	1458	7.68
2003	1239	6.52
2004	1333	7.02
2005	1499	7.89
2006	1511	7.96
2007	1463	7.70
2008	1476	7.77
2009	1412	7.43
2010	1143	6.02
2011	1069	5.63
2012	942	4.96
2013	911	4.80
2014	563	2.96
2015	452	2.38
Total	18979	99.92 or 100%

Mean- 1186.1875, Median- 1261.5, SD- 326.856996

Source: http://copyright.lawmatters.in/2014/06/access-to-cultural-heritage-and.html, http://indiankanoon.org



While analysing the Table-1 with regard to filing of copyright cases in India it revealed that, the year 2006 records the highest 1511 (7.96%) cases out of 18979 followed by 1499 (7.89%) cases in 2005 and 1476 (7.77%) cases in 2008. It further visualised that, 2000 to 2011, the number of cases instituted in different high courts, central govt. of India etc., it exceeds thousand while, from 2012 to 2015, the filing of cases have been dropped down to three digits and it shows the awareness and consciousness of the Copyright Act, 2012.

Table-2:Copyright cases in Cultural Heritages in India

Year	No. of cases	% of Violation
2000	13	8.07
2001	10	6.21
2002	10	6.21
2003	10	6.21
2004	13	8.07
2005	11	6.83
2006	09	5.59
2007	13	8.07
2008	10	6.21
2009	16	9.93
2010	11	6.83
2011	09	5.59
2012	06	3.72
2013	07	4.34
2014	08	4.96
2015	05	3.10
Total	161	99.94 or 100

http://copyright.lawmatters.in/2014/06/access-to-cultural-heritage-and.html,
http://indiankanoon.org/
Mean- 10.0625, Median- 10, SD- 2.839454173

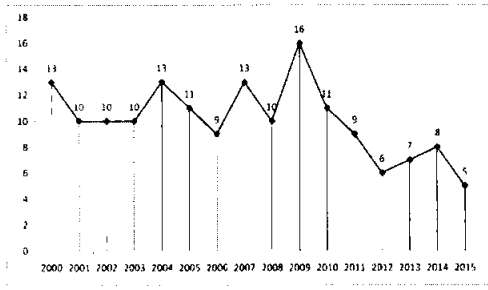


Table-2 on analysis with regard to filing of copy right cases in cultural heritages in India revealed that, there were 161 cases filed in between 2000 to 2015 in different high courts, central government etc. and out of 161, 16 cases were filed on account of violation of copyright for cultural heritages which constitute the highest i.e, 9.93% followed by 13 cases each (8.07% each) in the year 2000, 2004, 2007, 11 cases each (6.83% each) in the year 2005, and 2011. It could be further found that10 cases each has been filed (6.21% each) in the year2001, 2002, 2003, 2008 and minimum has been counted i.e, 5 (3.10%) in the year 2015. Here also it could be presumed that, this is the impact of Copyright Act 2012 and its stringent rules

Table-3:Infringement of copyright cases in India

Year	No. of cases	% of Violation
2000	755	7.68
2001	685	6.97
2002	757	7.70
2003	681	6.92
2004	763	7.76
2005	777	7.90
2006	771	7.84
2007	740	7.53
2008	718	7.30
2009	689	7.01
2010	584	5.94
2011	580	5.90
2012	415	4.22
2013	411	4.18
2014	293	2.98
2015	208	2.11
Total	9827	99.94 or 100

http://indiankanoon.org/

Mean- 614.1875, Median- 687, SD- 183.7278

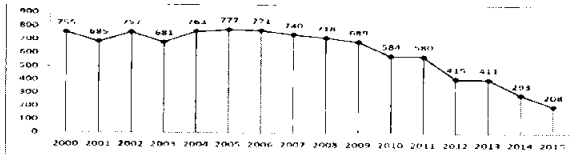


Table-3 shows the infringement of copyright cases in India from 2000 to 2015 and the table on analysis revealed that, out of a total number of 9827 cases, 777 (7.90%) cases were filed on account of infringement of copyright which is the highest in the year 2005 followed by 771 (7.84%) in the year 2006 and 763 (7.76%) in the year 2004. With the promulgation of Copyright Act 2012 it could be pointed out that, the number of infringement cases were dropped down to 208 (2.11%) in 2015 which is the lowest in a span of 16 years.

- Analysis of all the three tables revealed that, the mean value comes to 1186.1875, 10.0625, 614.1875 respectively for Copyright cases in India, Copyright cases in Cultural Heritages in India, and Infringement of copyright cases in India respectively followed by the median value 1261.5, 10, 687 and SD- 326.856996, 2.839454173, 183.7278 respectively.
- From the analysis it could be inferred that, even if public awareness is there with regard to Copyright Act 2012, still efforts need to be initiated through projecting it in various social medias, academic institutions etc. to minimise the rate.

Remedies for Trademark Infringement

A suit can lie in District or High court

- Punishment extends from **6 months to 3 years**
- A permanent bans on engaging in commercial activities
- A **suit** can lie in the district court or in a high court u/s 63 of the copyright act, 1957
- Punishable with imprisonment upto **3 years** and fined as per the claims.

COPYRIGHT CLAIMS ON THE BASIS OF UNDERLYING ARTISTIC WORKS

Conclusion

- Cultural heritage constitute a multifaceted resources which project the nations' glory through values, customs, fabrics, practices that the people of respective region adapt
- The cultural heritage both intangible and intangible by nature, produces value systems, beliefs, traditions, lifestyles and contains these tangible traces from antiquity to the recent past.

- Importance of cultural heritage that contains cultural manifestations, the wealth of knowledge and skills are transmitted from generation to generation and thus, it keeps a trend in the social and economic value of the region.
- Such type of indigenous knowledge requires to be protected through more stringent rules in the copyright along with measures from different groups to make it live by using technology.

List of Plagiarism softwa

1. Online software and Free Software

Plagiarism, DulicateChecker, Copyleaks, PaperRater, Plagiarisma, PlagiarismChecker

Plagium, PlagScan, PlagTracker, Viper, Quetext, Plagiarism Detector, Plagirisma.Net, Copyscape

2. Proprietary software

Turtin- University of Nairobi

Source

http://www.kabianga.ac.ke/library/plagiarisimdetectors.html

http://elearningindustry.com/top-10-free-plagiarism-detection-tools-for-teachers



Dr. O.N. Chaubey is working with Indira Gandhi National Centre for the Arts, New Delhi. Prior to this he was on deputation for three years with Election Commission of India, New Delhi. Presently he is incharge of 'Digital Preservation of cultural Digital Data'a collaborative project of C-DAC, Pune and financed by Ministry of Information Technology, Government of India. He has attended various National and International Conferences and presented 25 papers. He has 27 years of professional experience in the Documentation, Information Management using ICT and modern library administration and management. He has also edited five publications. Presently he is Senior Vice-President of Indian Library Association.

Implementation and Utilization of N-LIST Programme in Shree M. & N. Virani Science College, Rajkot: *A Study*

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Abstract: The study tries to find out the usage of e-resources available under N-LIST programme by the UG students, PG students and faculty members of Shree M. & N. Virani Science College, Rajkot. The study aims at ascertaining the awareness of N-LIST programme, understand the usage pattern, purpose for using N-LIST e-resources, problems faced by the users while accessing N-LIST e-resources, level of satisfaction, the needs for orientation programmes and the various suggestions put forward by the users. The questionnaire method has been adopted to elicit the opinion of users about the utilization level of N-LIST programme in Shree M. & N. Virani Science College. Most of the respondents were aware of N-LIST Programme and majority of them came to know about N-LIST e-resources from the college librarian. A few of the respondents have suggested that more resources such as Elsevier Journals and Science Direct may be included in N-LIST e-resources. It is hoped that N-LIST e-resources will be accessible to more colleges with a wider coverage in future.

Keywords: N-LIST Programme, E-resources, INFLIBNET, Consortia

1. Introduction

Library is a repository of resources. It is an integral part of the education system whose primary function is to serve the users. Due to rapid growth of documents and escalation in the cost of printed materials as well as e-resources, it has become very difficult for a library to afford the expenses of all resources they require. In present time, E-resources are the prime ingredients and become a common part of the suite of most academic library resources. The academic libraries often prefer e-resources to substitute print collections for optimum use. Many reasons like physical space, escalation in journal's price, digital literacy, discovery system and skilled man power force the academic libraries to opt for e-resources in meeting needs of the large community of users. Especially, e-journals have become widely popular among the library users. A lot of efforts have been taken in past few decades to overcome this problem of financial crunch by resource sharing through consortia for university libraries. UGC-INFONET Digital Library Consortium, INDEST-AICTE Consortium and N-LIST Programme are three major consortias serves to the universities and college library users.

2. Shree M. & N. Virani Science College, Rajkot:

Shree Manibhai Virani and Smt. Navalben Virani Science College, Rajkot is managed by Sarvoday Kelavani Samaj and was established in 1968. It has been accredited at 'A' Level by NAAC, has the 'STAR College Department' Status by MST-DBT, declared as "A College with

Potential for Excellence - CPE (Phase-II)" and recently conferred an Autonomous college status by UGC. The College is affiliated to Saurashtra University and provided grants by UGC. The College offers under graduate and post graduate courses in the field of Basic and Applied Sciences, Life

3. Objectives of the Study:

- To know the awareness of N-LIST Programme among the faculty members and students of Virani Science College
- To study the purposes of using N-LIST Programme.
- To find out the hindrance and problems faced by the users while accessing and using N-LIST e-resources.
- To know the level of satisfaction among the college library users of N-LIST programme.
- To examine the various suggestions put forward by the users.

4. Scope And Limitation

The scope of the present study is restricted to Faculty members, UG students and PG students of Shree M. & N. Virani Science College, Rajkot and use of the N-LIST Programme.

5. Methodology

For the present study the sample were drawn from the UG students, PG students and faculty members of Virani Science College. As per the research design altogether 200 number of library users were randomly selected for the present study. The self-designed close-ended questionnaire comprises of 21 questions that have been randomly distributed among the selected library users. The questionnaire was designed keeping in view of the objectives of the study to examine and evaluate the status of the usage of N-LIST e-resources, services and library usage pattern of the college library. The filled up questionnaires have been collected from the respondents for the data analysis and interpretations.

6. Analysis Of The Data

Table 1: Category wise Distribution

Status of Respondents	No. of Questionnaires Distributed	No. of responses Received	Percentage (%)
Faculty Members	30	26	86.66
UG Students	100	82	82
PG Students	70	56	80
Total	200	164	82

Table-1 shows that 200 questionnaires were distributed among the Faculty members, UG students and PG students, out of which 164 (82%) questionnaires have been received whereas 44 (22%) respondents did not respond. Therefore, the response rate is 82%.It is clear that out of 156 respondents, 26 (86.66%) respondents belongs to faculty members followed by 82 (82%) respondents belongs to UG students followed by 56 (80%) belongs to PG students. The above data indicate that the maximum number of responses have been received from the faculty members in comparison to UG students and PG students.

Table 2: Access to N-List E-Resources

Place	Faculty Members	UG Students	PG students	Total
College Library	14 (53.85%)	49 (59.76%)	31(55.36%)	94 (57.32%)
College Campus	8 (30.77%)	23 (28.04%)	16 (28.57%)	47 (28.66%)
Home	3 (11.54%)	10 (12.20%)	9 (16.07%)	22 (13.41%)
Hostel	---	---	---	---
Cyber cafe	1 (3.85%)	---	---	1 (0.61%)

Table-2 shows the place of accessing N-LIST e-resources among the respondents. 94 (57.32%) faculty members and students accessing e-resources from College Library followed by 47 (28.66%) of faculty members and students accessing from College Campus. About 22 (13.41%) faculties and students access the N-LIST e-resources from Home.

Table 3: Frequency of Accessing N-List E-Resources

Frequency	Faculty Members	UG Students	PG Students	Total
Daily	---	---	1 (1.79%)	1 (0.61%)
Once in 2 Days	2 (7.69%)	14 (17.07%)	1 (1.79%)	17 (10.37%)
Twice in a Week	2 (7.69%)	5 (6.1%)	30 (53.57%)	37 (22.56%)
Once in a Week	7 (26.92%)	6 (7.32%)	18 (32.14%)	31 (18.9%)
Once in 2 Weeks	14(53.85%)	48 (58.54%)	2 (3.57%)	64 (39.02%)
Once in a Month	---	1 (1.22%)	---	1 (0.61%)
Occasionally	1 (3.85%)	8 (9.75%)	4 (7.14%)	13 (7.93%)

The above table shows regarding the frequency of accessing N-LIST e-resources by faculty members and students. 64 (39.02%) faculties and students access N-LIST e-resources 'Once in Two Week', followed by 37 (22.56%) respondents access Twice in a

Week', 31 (18.9%) respondents access 'Once in a Week', 17 (10.37%) respondents access 'Once in Two Days', 13 (7.93%) respondents access 'Occasionally' and 1 (0.61%) respondents access e-resources 'Daily' and 'Once in a Month' respectively. The above data prove that most of the faculties and students access N-LIST e-resources "Once in Two Week".

Table 4: Mode of Search

Mode of Search	Faculty Members	UG Students	PG students	Total
Key Word	14 (53.85%)	58 (70.73%)	39 (69.64%)	111 (67.68%)
Title	2 (7.69%)	2 (2.44%)	3 (5.36%)	7 (4.27%)
Subject	5 (19.23%)	14 (17.07%)	9 (16.07%)	28 (17.07%)
Author	---	---	---	
Publisher	5 (19.23%)	8 (9.76%)	5 (8.93%)	18 (10.98%)

Table-4 shows that 111 (67.68%) respondents use 'Key word' whereas 28 (17.07%) respondents use 'Subject Wise' and 18 (10.98%) respondents use 'Publisher' for searching their documents. Very less number of respondents uses 'Title' for searching their documents.

Table 5: Purpose of Using N-List E-Resources

Purpose	Faculty Members	UG Students	PG Students	Total
For Academic	4 (15.38%)	58 (70.73%)	36 (64.29%)	98 (59.76%)
For Assignment	---	14 (17.07%)	4 (7.14%)	18 (10.97%)
For Research	4 (15.38%)		4 (7.14%)	8 (4.88%)
For Paper Presentation	3 (11.54%)	2 (2.44%)	4 (7.14%)	9 (5.49%)
For Writing Articles	11 (42.31%)	2 (2.44%)	5 (8.93%)	18 (10.97%)
For Writing Books	3 (11.54%)	---	---	3 (1.83%)
To Keep abreast with the latest Development	1 (3.85%)	6 (7.32%)	3 (5.36%)	10 (6.1%)

The study reveals that faculty members and students of the college accessing N-LIST e-resources for various purposes. Table-5 indicate that the majority of them 98 (59.76%) access it mainly for academic purpose, while some use it for preparing assignment, writing

articles and a few others use it for research work, paper presentation, writing books and upgrade their knowledge with the latest development.

Table 6: Uses of E-Resources under N-List Programme

E-Resources Under N-LIST Programme	Faculty Members	UG Students	PG students	Total
E-Journals				
American Institute of Physics	1 (3.84%)	1 (1.22%)	1 (1.79%)	3 (1.83%)
American Physical Society	1(3.84%)	---		1 (0.61%)
Annual Reviews	7 (26.92%)	23 (28.05%)	50 (89.29%)	80 (48.78%)
Cambridge University Press	4 (15.38%)	63 (76.83%)	47 (83.93%)	114 (69.51%)
Economic and Political Weekly	4 (15.38%)	1 (1.22%)	1 (1.79%)	6 (3.66%)
Indian Journals	17 (65.38%)	75 (91.46%)	51 (91.07%)	143 (87.20%)
Institute of Physics	3 (11.54%)	---	---	3 (1.83%)
JSTOR	2 (7.69%)	---	---	2 (1.22%)
Oxford University Press	21(80.77%)	78 (95.12%)	49 (87.5)	148 (90.24%)
Royal Society of Chemistry	9 (34.62%)	5 (6.08%)	49 (87.5)	63 (38.42%)
H. W. Wilson	3 (11.54%)	1 (1.22%)	4 (7.14%)	8 (4.88%)
E-Books				
Cambridge Books Online	14 (53.85%)	59 (71.95%)	2 (3.57%)	65 (39.63%)
E-brary	18 (69.23%)	2 (2.44%)	41 (73.21%)	61 (37.20%)
EBSCoHost-Net Library	2 (7.69%)	18 (21.95%)	---	20 (12.19%)
Hindustan Book Agency	---	4 (4.88%)	2 (3.57%)	6 (3.66%)
Institute of South East Asian Studies(ISEAS)	---	1 (1.22%)	1 (1.79%)	2 (1.22%)
Oxford Scholarship	14(53.85%)	53 (64.63%)	3 (5.36%)	70 (42.68%)
Springer E-Books	19(73.08%)	52 (63.41%)	2 (3.57%)	73 (44.51%)
Taylor Francis E-Books	8(30.77%)	53 (64.63%)	---	61 (37.20%)
My-i-library-McGraw Hill	4(15.38%)	5 (6.08%)	2 (3.57%)	11 (6.70%)
Sage Publication E-Books	2(7.69%)	3 (3.66%)	3 (5.36%)	5 (3.05%)

Note: Because of multiple choice options, the percentage is exceeded to more than 100%.

Table-6 depicts that in case of E-Journals 148 (90.24%) respondents use 'Oxford University Press', followed by 143 (87.20%) use 'Indian Journals' and 114 (69.51%) use 'Cambridge University Press'. 'Annual Reviews' and 'Royal Society of Chemistry' also use in good numbers. The second part of Table-6 indicates that in case of E-books, majority of respondents 73 (44.51%) uses 'Springer E-Books', 70 (42.68%) uses 'Oxford scholarship', 65 (39.63%) uses 'Cambridge Books Online, 61 (37.20%) uses 'E-Brary' and 'Taylor Francis E-Books'. A few respondents also use Hindustan Book Agency, ISEAS, My-I-Library-McGraw Hill and sage Publication E-Books.

Table 7: Preferences to Take Copy of Searched Materials

Preference	Faculty Members	UG Students	PG Students	Total
Print Copy	7(26.92%)	26 (31.70%)	14 (25%)	47 (28.66%)
E-mail/Google Drive	3 (11.54%)	8 (9.76%)	5 (8.93%)	16 (9.75%)
Pen Drive	15 (57.69%)	42 (51.22%)	35 (62.5%)	92 (56.10%)
CD/ DVD	---	---	---	---
Memory Card	1 (3.85%)	6 (7.32%)	2(3.57%)	9 (5.49%)

Table-7 shows the majority of the respondents 92 (56.10%) prefer to use pen drive for searched materials. About 47 (28.66%) respondents prefer to take print out and some of them 16 (9.75%) store it on their E-mail and Google Drive. 9 (5.49%) respondents have opined that they prefer to use memory card.

Table 8: Problems Faced while Accessing N-List E-Resources

Problem	Faculty Members	UG Students	PG Students	Total
Varied Search Pattern	1 (3.85%)	2 (2.44%)	3 (5.36%)	7 (4.27%)
Poor Internet Connection		4 (4.88%)	3 (5.36%)	7 (4.27%)
System Hardware Problem		1(1.22%)	1 (1.79%)	2 (1.22%)
Virus / Unwanted Programs		2 (2.44%)	2 (3.57%)	4 (2.44%)
Frequently Power Failure		---		
Slow Server	2 (7.69%)	6 (7.32%)	8 (14.28%)	16 (9.76%)
Needed information not available	4 (15.38%)	7 (8.54%)	2 (3.57%)	13 (7.93%)

As per above data, majority of the respondents around 70 % have did not face any problem while accessing N-LIST resources. Whereas some respondents faced problem while accessing this e-resources such as 16 (9.76%) due to slow server, 13 (7.93%) opined that needed information are not available, a few respondents 7 (4.27%) face problem due to varied search pattern, 7 (4.27%) due to poor internet connection, 4 (2.44%) due to virus or unwanted programs and 2 (1.22%) due to system hardware problem.

Table 9: Level of Satisfaction of N-List E-Resources

Level of Satisfaction	Faculty Members	UG Students	PG Students	Total
Fully satisfied	12 (46.15%)	32 (39.02%)	27 (48.21%)	71 (43.29%)
Partially Satisfied	10 (38.46%)	26 (31.71%)	15 (26.79%)	51 (31.1%)
Slightly Satisfied	3 (11.54%)	21 (25.61%)	11 (19.64%)	35 (21.34%)
Not Satisfied	1 (3.85%)	3 (3.66%)	3 (3.66%)	7 (4.27%)

The above Table-9 indicates that 71 (43.29%) respondents are fully satisfied with the information retrieved through N-LIST programme, followed by 51 (31.1%) respondents are Partially Satisfied. The table also depicts that 35 (21.34%) respondents are Slightly Satisfied, whereas only 7 (4.27%) are not satisfied by the services provided by this N-LIST programme.

Table 10: Need for Orientation Programme of N-List E-Resources

Need for Orientation Programme	Faculty Members	UG Students	PG Students	Total
Agree	20 (76.92%)	45(54.88%)	31 (55.36%)	96 (58.54%)
Strongly Agree	6 (23.08%)	37 (45.12%)	25 (44.64%)	68 (41.46%)
Disagree	---	---	---	---
Neutral	---	---	---	---

The above table-10 shows the need for orientation programme for smooth running of N-LIST e-resources. It depicts that majority of faculty members and students 96 (58.54%) agreed whereas 68 (41.46%) faculty members and students are strongly agreed for the need of the Orientation programme for the smooth running of N-LIST e-resources.

Table 11: Pages Views per Year by Users

Year	Total No. of Pages Views
2010	135
2011	1258
2012	434
2013	1163
2014	294
2015	262

Table-11 shows that the highest number of page views occurs in the year 2011 (1258) and the lowest number of page views occurs in the year 2015.

7. Findings and Suggestions

Some of the major findings from the analysis and interpretation of data are represented as follows:

- Regarding status of the respondents, it was found that total number of respondents is 164. Majority of Faculty members 26 (86.66%), UG students 82 (82%) and PG Students 56 (80%) participated in this survey.

- It was found that majority of users are aware about the N-LIST e-resources and they were aware through college library staff.
- It was found that 94 (57.32%) and 47 (28.66%) faculty members and students were accessing N-LIST e-resources from the library and college campus. Although individual User ID and password is given, majority of the faculty members and students using the available infrastructure in the college campus.
- The survey result represents that most of the faculty members 14 (53.85%) and UG students 48 (58.54%) accessing e-resources once in a two weeks, whereas PG students accessing e-resources twice in a week. It also found that very less number of respondents 1 (1.79%) accessing e-resources on daily basis.
- The study reveals that maximum number of faculty members and students 111 (67.68%) used 'key word' for searching their documents.
- Majority of faculty members and students 94 (57.32%) access it mainly for academic purposes, while some use it for research and writing articles, for paper presentation, for assignment and to keep update with the latest development. It is seen that N-LIST programme will surely improve the quality of teaching as well learning in those colleges, who have subscribed these e-resources.
- In case of e-journals, it is found that majority of faculty members and students access Oxford University Press 148 (90.24%), Indian Journals 143 (87.20%) and Cambridge University Press 114 (69.51%).
- In case of e-books, majority of faculty members and students access Sringer E-Books 73 (44.51%), Oxford Scholarship 70 (42.68%) and Cambridge Books Online 65 (39.63%).
- Most of them save the search results and transfer it to storage devices such as USB while some others take print copy of it. A few of them store it as email attachments and Google Drive.
- The survey shows that N-LIST e-resources seem to be very effective therefore most of the faculty members and students (70%) did not faced any problems while accessing these e-resources.
- The survey result represents that most of the faculty members and students 71 (43.29%) are 'Fully Satisfied" by the services provided through N-LIST Programme.
- It was observed that all the faculty members and students feels there is a need of N-LIST orientation/ training programme. It is ascertain that all library users feel N-LIST e-resources is very useful. The study reveals that colleges where orientation programmes have been conducted, the use of N-LIST e-resources is very high.
- A few faculty members and students suggested to include more resources while few faculty members suggested to include Elsevier publications mainly Science Direct.
- INFLIBNET Centre should organize seminars, workshops, and orientation programmes for faculty and students for accessing N-LIST services at regular interval of time to keep them update with latest technological changes.

- A study has also tried to procure suggestions from faculty members and students to improve the programme. In anticipation that INFLIBNET centre will surely expand the scope of N-LIST e-resources.

8. Conclusion

N-LIST Programme is gaining fame within a short span of time and more colleges are becoming members of this programme day by day. This programme covers most of the disciplines viz Pure Sciences, Social Sciences and Humanities including Linguistics and Languages, besides this N-LIST programme help the scholars and researchers to find their documents on their door step. Majority of the users are aware of the programme and college librarian are playing an important role in helping them to use the e-resources available under this programme. The MHRD, Government of India is spending large amount on the e-resources which are made available via consortia. The e-resources in the virtual world represent a large investment of people's effort, money and wisdom so the users should become familiar with latest information resources and to make optimum utilization of e-resources available in the institution. It is hoped that N-LIST Programme will widen its scope and cover more journals of all the subjects and the number of e-resources available currently through this programme will be enhanced.

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Internet as a Tool for Learning and Knowledge Building: *A study of Students Attitude towards the Use and Awareness of the Internet for Learning*

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Abstract: The main aim of the present study is to examine the student's attitude towards use and awareness of Internet for learning. The study adopted a questionnaire-based survey research design, 150 questionnaires were distributed among postgraduate students, out of which 140 filled questionnaires were received after duly filled for analysis. The result of the revealed that Google was the search engine used most of the respondents 90(64.31%) and only 02(01.42%).of the respondents used Netscape. Majority 98(70.00%) of respondents reported that they use internet on daily, 71(50.71%) of the respondents reported that they use the Internet for their study. The results of study reveals that assistance requires in the effective use of Internet resources, therefore the University library should organize various user education/orientation programs for effective use of Internet, electronic resources and develop the information searching skills.

Keywords: Internet, ICT, PG students, Mangalore University, Karnataka.

1. Introduction

Internet has turn into a significant part of human life. The present situation considered as there is no life without internet (Ali, 2013).The Internet is a learning tool with abundant potentials. It may be used to substitute the conventional classroom lectures or improvement conventional instructional methods (Fasae and Aladeniyi, 2012). The Internet permits learners to converse with other learners abroad and thus exchange each other's ideas, thoughts, knowledge, experiences, and cultures(Khan and others ,2011).Information at the moment just a 'finger touch' remoteness away from the clients and it would not be unsuitable to speak that the Internet has turn into the prime worldwide digital information library(Ogunsola,2005) which offers the maximum access to the precise information in fraction of seconds of time to clients at any time and at anywhere in the world (Kumar and Kaur,2005). Nowadays, enormous growth of the Internet has modified the way of educational system which is a significant manner of accessing and disseminating information quickly (Omotayoa, 2006). With the advent of information communication technology, such information can be acquired easily through just one click of a mouse (Jadhav, 2011). Absolutely, the use of internet has developed quickly in the country's education system particularly up to the higher educational level. It is clear that use of

internet has a vast impact on the learner's academic carrier. Therefore we want to get a lot of significant information via internet about relations with other variables particularly in academic contexts that are essential for youthful generations. So the present research study is an effort to investigate awareness and use of internet among students.

2. About Mangalore University

Mangalore University was set up on September 10, 1980.One of the beautiful education campus situated in Mangalagagotri almost 20 KM away from the Mangalore city,Karnataka. It is a picturesque campus that sprawls over 333 acres, overlooking the confluence of the river Nethravathi with the Arabian Sea on the one side, and the cloud-capped Western Ghats on the other. The university imparts higher education in field of arts, commerce, science, law and management. The University campus is a self-contained facility that provides all the essential facilities and infrastructure for the pursuit of excellence in higher education. The University has taken steps to establish contacts through exchange of scholars and students with universities in USA, UK, Finland, Japan, Norway, Germany, Spain and other countries.

3. Objectives of the study

- To discover the frequency of Internet use among students.
- To investigate the awareness of internet usage among the students.
- To identify the preference of place and time for accessing internet.
- To examine the purpose of using internet among students.
- To study the factors affecting on the internet usage by students.

4. Methodology

The study attempts to inspect the internet access and use by postgraduate students of Mangalore University, Mangalore. To accomplish the above objectives of the study, a survey method was conducted using a well structured questionnaire. In a total 150 questionnaires were issued to students of different departments. Out of which, 140 filled questionnaires were received back. The collected data were classified, analyzed and tabulated by using statistical methods. The present study is limited only postgraduate students of Mangalore University main campus.

5. Analysis of Data and Discussion

Table 1: Gender of Respondents

Gender	Frequency	Percent
Male	44	31.43%
Female	96	68.57%
Total	140	100.00%

From the above table shows that majority 96(68.57%) of the respondents were female and 44(31.43%) were male.

Table 2: Access to Internet

Location	Frequency	Percent
Departmental Computer Lab	69	49.28%
Library	45	32.16%
University Hostel	11	07.85%
Internet Café	07	05.00%
Any other	08	05.71%
Total	140	100.00%

It was found form the above table that 69(49.28%) of the respondents stated that they accessed the Internet from their departmental computer lab, while 45(32.16%) from the Library, 11(07.85%) at the University hostel, 08(05.71%) at any other place, and only 07(05.00%) at Internet cafés.

Table 3: Awareness of Internet use

Awareness	Frequency	Percent
Self Learning	26	18.57%
From Teacher/staff	83	59.29%
From Friends	16	11.43%
External Training Institutions	15	10.71%
Total	140	100.00%

The above table indicates that the respondents were asked how they were aware for using the Internet. The majority 83(59.29%) of respondents reported that they learned how to use the Internet from their teacher/staff, followed by 26(18.57%) from self learning, 16(11.43%) from friend and 15(10.71%) from external training institutions.

Table 4: Search Engine Preference

Search Engine	Frequency	Percent
Google	90	64.31%
Yahoo	25	17.85%
AltaVista	11	07.85%
Netscape	02	01.42%
Other	12	08.57%
Total	140	100.00%

From the above table demonstrates that Google was the search engine used most of the respondents 90(64.31%), whereas Yahoo, was used by 25(17.85%) of the respondents, AltaVista 11(07.85%), only 02(01.42%).of the respondents used Netscape.

Table 5: Frequency of Internet Use

Regularity	Frequency	Percent
Daily	98	70.00%
Twice a week	35	25.00%
Weekly	07	05.00%
Monthly	00	00.00%
Total	140	100.00%

The above table indicates that majority 98(70.00%) of respondents reported that they use internet on daily, followed by 35(25.00%), and only 07(05.00%) Weekly.

Table 6: Purpose of Internet Use

Purpose of Internet Use	Frequency	Percent
For Study	71	50.71%
Writing research articles/ assignments	33	23.57%
Sending e-mail	15	10.71%
Searching for jobs	11	07.85%
Entertainment	10	07.16%
Total	140	100.00%

The above table highlights that most 71(50.71%) of the respondents reported that they use Internet for their study, while33 (23.57%) used it to writing research articles/ assignments, another 11(07.85%) for searching for jobs, and 10(07.16%) for entertainment.

Table 7: Information searching through internet

Information	Frequency	Percent
Online Reference sources	16	11.42%
Online abstracting & indexing databases	18	12.85%
E-theses/E-dissertations	47	33.57%
E-books/E-journals	59	42.16%
Total	140	100.00%

The above table indicated that 59(42.16%) of respondents stated that they search E-books/E-journals via Internet, whereas 47(33.57%) e-theses/e-issertations,18 (12.85%). Online abstracting and indexing databases and 16 (11.42%) of respondents search online reference sources via Internet.

Table 8: Benefits of Internet over Conventional Documents

Benefits	Frequency	Percent
Easy to access	26	18.57%
Less expensive	16	11.42%
More informative	76	54.30%
Time saving	22	15.71%
Total	140	100.00%

The above table indicated that 76(54.30%) of the respondents reported that Internet is more informative when compared with conventional documents, followed by 26(18.57%) said easy to access, 22(15.71%) felt that is it time saving and 16(11.42%) of respondents stated that less expensive.

Table 9: Influence of Internet on Students Academic Efficiency

Influence	Frequency	Percent
Internet provides ease in study.	82	58.57%
Internet is a best communication device.	23	16.44%
Internet service should be provided 24 hrs a day.	19	13.57%
Internet is the fastest way for acquiring current accurate information.	16	11.42%
Total	140	100.00%

It was found from the above table exhibits that 82(58.57%) of the respondents believed that the use of Internet provides ease in study, while 23(16.44%) claimed that Internet is a best communication device, 19(13.57%) reported that Internet service should be provided 24 hrs a day, and 16(11.42%) Internet is the fastest way for acquiring current accurate information.. From this finding of the study, it is clear that the use of Internet have positively influenced the academic efficiency of the respondents.

Table 10: Problems Faced by the Respondents

Problems	Frequency	Percent
Lack of knowledge about advance searching	31	22.14%
Slow speed of Internet	12	08.57%
Difficulty in finding relevant information	64	45.71%
Overload of information on the Internet	17	12.16%
Inadequate computers in Lab	16	11.42%
Total	140	100.00%

The table 10 emphasizes the problems encountered while using the Internet by students. Difficulty in finding relevant information was the leading problem with 64(45.71%), while Lack of knowledge about advance searching has 31(22.14%), overload of information on the Internet 17(12.16%), and 12(08.57%) of respondents stated slow speed of Internet.

6. Major Findings of the Study

- Out of 140 respondents, 96(68.57%)of the respondents were female and 44(31.43%) were male.
- About 83(59.29%) of respondents reported that they learned how to use the Internet From their teacher/staff and 15(10.71%) from external training institutions.
- It was found from the study that Google was the search engine used most of the respondents 90(64.31%) and only 02(01.42%).of the respondents used Netscape.
- Majority 98(70.00%) of respondents reported that they use internet on daily, and only 07(05.00%) Weekly.
- About 71(50.71%) of the respondents reported that they use the Internet for their study and 10(07.16%) for entertainment.
- It was found from the study that 59(42.16%) of respondents stated that they search E-books/E-journals via Internet and 16(11.42%) search online reference sources .
- Most 76(54.30%) of the respondents reported that Internet is more informative when compared with conventional documents and 16(11.42%) of respondents stated that less expensive.
- It was found from the study that difficulty in finding relevant information was the leading problem with 64(45.71%) and 12(08.57%) of respondents stated slow speed of Internet.

7. Conclusion and Recommendations

The internet supplies a wealth of information. The University students are using the internet considerably and it inhabit an imperative place among different information sources. The findings of the shows that majority 98(70.00%) of respondents reported that they use internet daily for the study purpose. On the basis of the findings of the study, the following recommendations have been made. The results of study reveals that assistance requires in the effective use of Internet resources, therefore the University library should organize various user education/orientation programs for effective use of Internet, electronic resources and develop the information searching skills. The University library should facilitate internet connection speed to enable students make use of the Internet. At present, Internet is the of vital power of educational activities so the teachers/staff encourage the students for the use of Internet resources, and to create more awareness on e- resources Furthermore, University library as increasing the number of infrastructures

i.e. computers, internet connection and other requirements related to access of e-resources. It is also recommended that library professionals have to educate the learners within the electronic environment as per the varying needs and should assist them in using wide-ranging information searching tools with effectiveness.

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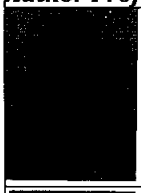
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Issues and Challenges of Engineering College Library Services in Aannd District of Gujarat: *A Study*

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Abstract: The engineering college libraries of Anand district are facing many problems due to lack of adequate finance, collection, sufficient manpower, and lack of infrastructure. As a result they cannot provide expected services to the users. In this paper a study has been conducted on the management and services of engineering college libraries in Anand district of Gujarat. The study intends to find out the various services rendered by the engineering college libraries in Anand district as well as users satisfaction from the existing services; status of library automation and problems faced by the college libraries and forwarded some vital suggestions.

Keywords: College Library, Library Services, Issues of college library, Gujarat

1. Introduction

The library is only one of many institutions changing in the face of technological advances. With its wealth of data and information-sharing capabilities, the web is a natural complement to traditional library services. Library services refer to the facilities that are provided by a library to the users for the purpose of using resources available in the library in order to meet their information requirement. A college library should ensure to collect and organize recorded information available in various formats in accordance with the aims and needs of the users. The college library, pulsing heart of the college campus, contributes to the realization of the objectives of the college. The objective of the college library is to make available its resources and services as an effective supplement to the instructional programmes undertaken by the college. There is an urgent need for the college libraries to re-invent their conventional procedures and methods practiced for organization and dissemination of knowledge in order to adapt in the recent technological changes. The study has been conducted on the engineering college library services in Anand district of Gujarat. The study intends to find out the various services rendered by the college libraries in Anand district as well as users satisfaction; status of library automation and problems faced by these libraries.

2. Scope of the Study

Anand is one of the richest district of Gujarat covering 4690 sq.km area with over 2.09 milion population, 8 Talukas, 352 Gram Panchayat and the Literacy ration is 74.5%. The

District is situated between 22° 6' to 22° 43' north latitude and 72° 2' to 73° 12' east longitude. Anand District is surrounded by Vadodara District in the east, Nadiad in the east and Ahmedabad District in the west. Two rivers, Sabarmati and Mahi are flowing on both sides of the District. There are all together 8 engineering colleges in Anand district and the present study covers services rendered user's satisfaction in 5 colleges of the district.

3. Methodology

Relevant data on the field of study are collected by adopting following methods:

a. Survey through questionnaires distributed to:
   - The engineering college libraries in Anand district under study in order to collect data related to the present functioning and services of the libraries.
   - To the different categories of engineering college library users under study to ascertain about their satisfaction from library services
b. Interviews, interaction made with library managers, library professionals and the users of the engineering college libraries of Anand district
c. 3. Personal observation

4. Analysis and Interpretation of Data

There are all total 05 engineering colleges in Anand district, out which 3 colleges are NBA accredited. The following Table 1 shows these colleges with their date of establishment one engineering college have got ISO 9001 and only one college have to get the certification for quality education.

Table 1: Engineering Colleges in Anand district under study

No	Name of college	Establish Year	Grade
1	SVIT-VASAD	1997	Accredited institute
2	Dr.Jivraj Mehta Institute of Technology – Mogar	2010	-
3	Chandubhai S Patel Institute of Technology, Changa	2000	ISO-9001
4	G.H Patel College of Engineering & Technology, V V Nagar	1996	Accredited institute
5	A.D. Patel Institute of Technology, New V V Nagar	2000	Accredited institute

- **Library Collection:** Table 2 bellow shows detail about the collection of the various engineering college libraries of Anand district under study.

In colleges like CSPITC, Changa and SVIT-Vasad the total collection is more than forty thousand, whereas in colleges like DJMIT, Mogar the collection is less than ten thousand. CSPITC, Changa College has the highest book collection of 59000. SVIT-Vasad College maintains the highest number of CD Collection of 3100. SVIT-Vasad College receives 240 copies of Printed Periodicals, CSPITC, Changa College has the highest number of total library collection which is occupies 23% of the summation of total collection of these colleges as shown in Fig. 1. It can be noted here that DJMIT, Mogar College Library has only 6377 book collection and no other collection. It neither subscribes any journal or newspaper nor reference books.

Table 2: Collection of the college under study

Name of college	Books	CDs	Book Bank	Printed Magazine	E-Journal	Newspapr	Bound Volumes	E-Books
SVIT	44000	3100	5400	240	8 pkg	10	1800	1500
DJMIT	6377	700		38	3 pkg	05		-
CSPITC	59000	3000	6000	140	8 pkg	10	1401	1500
GCET	34032	2750		132	7 - pkg	09		-
ADIT	28241	1722	4900	132	3 pkg	09	1734	654

- **LIS Services:** Table 3 below describes the services of the college libraries of Anand district under study.

Table 3: Services of the libraries under study

Services	SVIT	DJMIT	CSPITC	GCET	ADIT
Reading Roo	Yes	Yes	Yes	Yes	Yes
Scanning	Yes	No	Yes	Yes	Yes
Printing	Yes	No	Yes	No	Yes
Open Access	Yes	Yes	Yes	Yes	Yes
Circulation	Yes	Yes	Yes	Yes	Yes
Orientation	Yes	No	Yes	Yes	Yes
Xeroxing	Yes	Yes	Yes	Yes	Yes
Book Bank	Yes	No	Yes	No	Yes
SMS Alert	Yes	No	No	No	No
Internet Facili.	Yes	Yes	Yes	Yes	Yes
Lib. Time	9 to 6	10 to 5.00	8.30 to 4.30	8 to 6	8 to 6

From table it is clear that the highest numbers of services are provided by SVIT-Vasad College and the least number of services are provided by DJMIT-Mogar College. All the libraries have Open-access system, Reading Room, Circulation, Xeroxing, Internet facility. Only SVIT-Vasad College provides SMS alert to the library users. Reading room facility and circulation facility is common to all the colleges but some other basic services like orientation, printing service, Scanning services are provided in all colleges except DJMIT-Mogar. All the libraries under study remain open from Monday to Saturday. On average, the libraries remain open for 8 to 9 hours a day. GCET and ADIT-V V Nagar Colleges Library remain open for the maximum time of 9 hours a day and DJMIT-Mogar College Library remain open for the minimum time i.e. 7 hours a day.

- **Library Staff:** The following Table gives an idea about the staff strength of the different college libraries. Most of the libraries have good number of staff. ADIT-VV Nagar

college has the maximum number of staff (9 staff) which also has the 33.3% of users. ADIT-VV Nagar College has the highest number of Professional staff i.e. 9 numbers.

The Librarian of SVIT-Vasad, ADIT College have PhD degree and CSPITC, GCET College also have M.Phil Deegre. SVIT-Vasad College Library has the highest number of staff having computer knowledge i.e. 6 numbers. CSPITC, Changa College Library comes second with 5 staff member having computer knowledge. DJMIT-Mogar College has only 2 staff with computer knowledge.

Table 4: Staff strength of the libraries under study

Name of college	Qualification	Total Lib. Staf	Staff with Comp. literate	No. of Users	No of user per staff
SVIT	PhD - 1 MLIS- 4 BLIS- 6	08	06	3000	37.5
DJMIT	PhD- 0 MLIS- 1 BLIS – 03	04	02	1000	25
CSPITC	PhD /M Phil- 2 MLIS- 3 BLIS – 4	07	05	3000	37.5
GCET	PhD/M Phil-1 MLIS - 2 BLIS - 3	05	04	2500	50
ADIT	PhD/M Phil-1 MLIS- 2 BLIS- 4	09	03	2000	33.3
Total		31	20	11500	37

- **Library Automation:** Table 5 gives an idea about the Library Automation status of the college libraries under study.

Table 5: Library Automation Status

Name of college	Automated	Not automated	S/W used	Date of Impli.
SVIT	Yes	-	SOUL 20	2000
DJMIT	Yes	-	SOUL 20	2013
CSPITC	Yes	-	SOUL 20	2004
GCET	Yes	-	In-house	2001
ADIT	Yes	-	In-house	2003

Out of the five colleges under study, all five colleges have initiated automation in their libraries. All College libraries have already automated the cataloguing, circulation and acquisition. All College libraries have not done automation in serials.

- **Users view on Library Collection:** Different users have different information need. Their preferences are also differ from each other. The users' view on the availability of

different reading materials in the library and their level of satisfaction on the existing collection is given in the following table 6.

Table 6: User view on library collection

Name of college	Satisfied	Not Satisfied	Total no. of Surveyed	% satisfied	% not satisfied
SVIT	25	15	40	62.5%	37.5%
DJMIT	3	7	10	30%	70%
CSPITC	20	10	30	66.67%	33.33%
GCET	18	12	30	60%	40%
ADIT	10	10	20	50%	50%
Total	76	54	130	58.46%	41.54%

The table reveals that maximum users of CSPITC, Changa 66.66% are satisfied with the collections and the services of the library. SVIT-Vasad college followed by 62.5% in users satisfaction, while 70% of users of DJMIT-Mogar have expressed their dissatisfaction on library collection and the services provided by college library

5. Users' Satisfaction: Based on Survey

A library, besides acquiring and preserving documents properly also responsible for maintaining a retrieval process that promises a timely and accurate recall of the stored information and providing tools for manipulating the stored information efficiently. For manipulating and retrieving information efficiently libraries have undertaken certain technical works for processing the document. Among the technical works, the classification and cataloguing of documents are considered to be played a very important role for identifying and locating documents pin-pointedly. The methodology used for conducting users' study is questionnaire and interview methods. The survey has been covered two main categories of users of the college library such as Faculty Members and Students, which is tabulated in Table- 7 bellow:

Table 7: Users' Survey and Responses Received

Name of college	Category of User	User Size	Sample size
SVIT	Teacher – 150	10	7.34%
	Student - 3000	30	1%
DJMIT	Teacher – 50	04	8%
	Student – 1000	06	0.6%
CSPITC	Teacher – 150	07	4.67%
	Student - 3000	23	0.77%
GCET	Teacher – 100	05	5%
	Student – 2500	25	1%
ADIT	Teacher – 100	03	3%
	Student – 2000	17	0.85%
Total	Teacher – 550	29	
	Student - 11500	101	

The table 7 above reveals that the total size of user population under these two board categories is 12050 and a total of 150 (1.24%) questionnaires are distributed to them. Out of 150 questionnaires distributed, a total of 130 (86.67%) responses are received. Out of 130 responses received 29 (22.31%) are faculty members; 101 (77.69%) are students.

Rating by Users: The rate of satisfaction of the users depending upon the extent of services to which the libraries are able to satisfy them has been given in the Table 8 below:

Table 8: Library rating by users

Name of college	Excellent	Good	Average	Bad	Total	Excellent %	Good%	Average %	Bad %
SVIT	01	10	15	14	40	0.4%	25%	37.50%	35%
DJMIT	--	03	03	04	10	-	30%	30%	40%
CSPITC	02	07	11	10	30	6.67%	23.33%	36.67%	33.33%
GCET	-	06	12	12	30	-	20%	40%	40%
ADIT	-	05	05	10	20	-	25%	25%	50%
	03	31	46	50	130				

From the survey it is found that that the users of CSPITC, Changa college are highly satisfied from the services rendered by the college with 6.67% rated as excellent. The users of DJMIT-Mogar College are least satisfied with the services of library with 40% rated as bad.

6. Major Findings of the Study

Library is one of the most important assets of any college. The success of a college largely depends on the condition of the college library. In this age of ICT, many new service and facilities are introduced in the library and information centre. Through the survey it is found that most of engineering college libraries of Anand district are rendering services to its patron in modern way. Out of the five college libraries surveyed, five colleges have initiated automation in their libraries. This is indeed very good.

From the survey it is found that all five of the engineering college libraries of Anand district are providing facilities like open access, circulation, Internet, reading room, periodical room, Inter library loan, Xeroxing and book bank to its users. Other services like scanning, printing, issue of periodical, orientation programme, SMS alert etc are provided in majority of the colleges. College libraries like CSPITC, Changa College and SVIT-Vasad College have more than forty thousand collections in its library but in other colleges like DJMIT-Mogar College, collection is less than ten thousand. Some college libraries have very less number of printed journals and newspapers.

Most of the college libraries have very good numbers of staff. Moe over most of the staffs are computer literate. All five college library, only two have professional librarian and three have library assistant. In all college libraries all have library committee. Only SVIT-Vasad college library is rendered SMS alert service to their library users. This library has also digital library. They have their own library portal, on this portal 1500+ e-books are uploaded, every user can access this portal any where from the campus.

7. Suggestions

Some of the suggestions for improving engineering college library services in Anand district are given bellow:

- The collection of the libraries should be enhanced.

- E-Journals should be subscribed for quality education.
- The number of reference collection should be improved.
- There should be more subscription of journals and newspapers.
- The opening hour of the libraries should be extended and kept open beyond college hours.
- Orientation programme should be conducted to introduce the user to the library.
- Photocopying, Bibliographic Service, ILL, current awareness service, computer facility and internet facility, document delivery service should be provided to the users.
- The staff should be well acquainted with the latest technology.
- User survey should be conducted in order to know users requirement.
- The college libraries of Anand district should adopt modern technology and convert themselves
- In automated library phase – wise, for that electronic resources should be procured in the library.
- To enhance interlibrary loan service, online databases should be subscribed.

8. Conclusion

To sustain in this age of Science and technology, a college library should equip itself with modern machines and gadgets. The college libraries should switch over from the traditional system to the modern system to cope up with the ever changing world of Science and technology. The choice, requirements and demand of the users are also changing and increasing in rapid way in this age. To fulfill these requirements and demands of the users, the college libraries need to change themselves and come out from the traditional cage

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Author's Profile

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Library Portal of Sant Gadge Baba Amravati University Library: *A Gateway of Information for Information Seekers*

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Abstract: Development of portal for the library is now a day a major requisite for the modern automated library. Library stake-holders prefer to login on the portal rather to enter the library physically for accessing the needed information. Considering this scenario the authors have highlighted the concept of the 'Portal' and further more have attempted to fix the responsibility to the librarians for developing the portal of their libraries for their stack-holders. The library portal of Sant Gadge Baba Amravati University Library is discussed in detail along with its utility reports. Advantages of library portal are also given in the paper.

Keywords: Library Portal, Portal, Sant Gadge Baba Amravati University Library Portal

1. Introduction

Information plays pivotal role in this modern age of 'information society'. It is an important resource in the creation, maintenance and development of society. It is a key factor in making the nation strong. As far as individual is concerned, everyone needs information for their own development. Everybody knows that information is essential factor for gaining knowledge. Therefore, such needy persons strenuously take efforts to search the various available sources of information. In this technological age the Internet is the biggest source of information. However, on Internet the information is scattered in thousands and millions of websites. Search engines such as Google, yahoo, and many more are available for the information seekers to retrieve the required information from this ocean. Even then practically it is very difficult to find out the pinpointed information. Because after giving the specific keyword to the search engine, it provides thousands and some time millions of hits on it which is further very difficult, tedious and time consuming job to search and select the required information from these hits. It means though the search engine is the effective tool in the hands of seekers of information for finding out the appropriate information, but the information come out through it has more recall as compare to the precision ratio. Moreover, search engines can't categorised the relevant and irrelevant information for the seekers. As the information generation is the unending task, the addition of information in the domain of Internet is also a continuous process. It creates problem and headache for the common persons and even for some times to the experts to search the appropriate information of their interest. In such circumstances other effective tools are to be essentially found out to make the search easy and time saving for the seekers of information. In the age of Internet revolution in large extent 'Portal' can solve this problem.

2. Sant Gadge Baba Amravati University library: A Brief Profile:

Sant Gadge Baba Amravati University library came into existence on 1st May 1983 with the establishment of Sant Gadge Baba Amravati University previously known as Amravati University. The university is located at Amravati in Maharashtra (India) a famous historical place on Mumbai-Howrah railway route. The University Library building is located in the midst of the university having 8094 sq. meters. built up area. The building is planned on functional basis in order to render effective and efficient services to users. Recently the University is accredited with 'A' grade by National Assessment and Accreditation Council (NAAC). The library has rich collection on Science and Technology, Social Science, Management, Education, Physical education and Home science. It covers books, reference books, e-books, journals, back holdings of journals, e-journals, theses, dissertations, online databases, reports, proceedings of seminar, conferences etc. The URL of it is www.sgbaulib.com.

3. Information about the library

Under this category, about library, Rules, Membership, Services, Events, Institutional Repository, Enabling Unit, Library Statistics, New Addition, Library Collection, Theses and Question Papers these parts have been covered on the portal. The portal gives the very basic information about the library staff including their rank and concerned section, organizational structure and hierarchy of posts. The Library Committee constituted as per the Maharashtra University Act 1994 u/s 75(1)(a) is given along with its duties and the major decisions taken. The library rules and regulations have been delineated in detail so as to make the users aware under condition which they can have library services and avoid awkward situation. This is followed by the services given by the library. The next link contains photo gallery of major events such as book exhibition, training programmes, librarians' meet and many similar occasions. Institutional Repository contains information pertaining to annual report, convocation speeches and NAAC reports. Very useful information about the facilities for differently-abled person is also given under the sub category 'Enabling Unit'. Statistics of the library is also uploaded on the portal as a part of transparent policy. The current information published in newspapers on political, social, economical aspects, science, sports and entertainments especially in Marathi is brought together and made obtainable through newspaper clipping. The important news, events, information with regard to tenders, quotations are highlighted through portal and given enlarged access.

- **E-resources subscribed by the library**

The SGBAU library is regular subscriber of many important databases like ProQuest Science Journals, ABI-INFORM Complete, LISA, Science Online, IEEE Xplore Digital Library, ACM Digital Library, Indiastat, Science online, Manupatra and Sage Journals. Besides, 17 databases from UGC-Infonet Digital Library Consortium are also accessible through the portal. These databases and also few e-books have been vital source in providing essential

nutrients to research scholars in the University. These databases are comprehensive of research need, engineering information and statistical figures required by the people in the field of Science, Social Science, Commerce, Engineering, Law, Education and Home Science. These databases are accessible within the campus with IP based access. However, among faculty members and registered research scholars of the University those who want to access from outside the University, login ID and password is provided to them. The subscription to Ez-Proxy has solved the problem with regard to off campus remote access. The regular and unswerving subscription to the e-resources has fundamental reason behind rising access to the portal. The portal also gives a great deal of information on Shri Sant Gadge Maharaj and Rashtsant Tukdoji Maharaj which consist of newspaper clipping, audio-video, bibliographical information with regard to books published on them. This is significant as both of them had made their valuable impact as a social reformer on the Indian society.

- **Important major links**

The third part of the portal is concerned with the major links which may be useful for the users. These links are scattered over the home page of the portal. Few of the links are provided under the sub heading 'Related Link'. These links are classified and organized according to the needs of the users. It comprises reports of various Committees and Commissions, Acts, Gazetteer of Maharashtra, Indian Trade Directory, Citation Styles in Research, Open Access Journals, Theses, the Government publications and many more vital documents. Besides, following links are also given on the portal

- **IndCat**: IndCat, a Union Catalogue of Indian Universities has now become grand source of bibliographic information that can be accessed for interlibrary loan, collection development as well as for copy cataloguing and retro-conversion of bibliographic records. The SGBAU library itself is making immense use through portal. Since its link is available on the portal, the same usage is being expected by other working professionals.
- **Shodhganga and Shodhgangotri**: Sant Gadge Baba Amravati University Amravati has signed MoU with INFLIBNET regarding the digitization of theses submitted to and accepted by the University. Besides, theses submitted to the other Universities and which have their MoU with INFLIBNET can be viable through link available as 'Shodganga'. The interesting fact is that most of the Indian Universities, theses are neither issued nor even permitted for having xerox copies. But access via Shodhganga enables the user to browse, to view, to download in parts or fully and even take the print out of more than 65400 theses contributed by 231 Universities required by whomsoever. 1900+ synopses are also available for the researchers on Shodhgangotri. The library believes in knowledge free to all. It has been argued by many that open access to theses would endorse the plagiarism. Nevertheless, the efforts of the Library in using 'Urkund' are praiseworthy.

- **e-pathshala' and 'Vidwan database**: The important reason for the popularity of library portal is 'e-pathshala' and 'Vidwan database'. The former is a gateway to all post-graduate courses gives connectivity to 1300+ modules expressive of all the subjects. The latter is the premier database of profiles of scientist/researchers and other faculty members working at leading R & D organisation and other Academic Institution involved in teaching and research in India. The database provides important information about experts' background, contact address, skill and accomplishments. It also offers opportunity to register oneself as Subject Expert provided that one must satisfy the criteria expected by the INFLIBNET. In-short, E-vidwan lends a hand in finding core subject professional in their field and e-PG-pathashala to get in-depth knowledge in multitude facet in their subject.
- **NPTEL**: Both e-pathshala' and 'Vidwan databases are supplemented by the link to National Programme for Technology Based Learning (NPTEL) which is the largest video repository of technical lectures in the World. It is remarkable for creating course for five engineering branches (Civil, Computer Science, Electrical Science, Electronics Communication and Mechanical Engineering) content and making it available across the world.
- **Open Access Journals**: The library has judiciously searched a few free online resources in various subjects. Its classification and systematic organisation are offering alternative for information gathering to the researchers. This has been useful since users need not to log in to individual websites and subject based arrangement of pertinent websites have increased its efficacy and convenience thus saving their time and efforts.
- **Knimbus:** The Knimbus, federated search engine offers common search interface to search all the subscribed databases and open source material available through portal.

4. Online Service through Portal

Services are the backbone of any kind of libraries. Considering this fact as usual SGBAU Library also pays special attention towards this area. In the digital era the phase of traditional librarianship is transferring to the virtual librarianship. However, though the phase has been changing but the traditional library services are not being changed. Only the way of extending the services has been changed in to this digital era. Moreover, in the traditional librarianship the services are provided from the library. It means users have to come to library physically to avail the library facilities. On the contrary, in the modern virtual library, portal/website is a platform through which the services or facilities are extended to the users. In this changing landscape SGBAU Library is also attempting to provide its services to the users through its portal. The major services provided by this library through portal are online referral service, e-clipping, web-OPAC, Consortium services to UG and PG Colleges, remote access service, document delivery service, plagiarism checking, federated search service, current content page service, new arrivals, institutional repository, etc. Online resources play pivotal role in study and research in higher education in the advanced atmosphere of Information and Communication

Technology. Students, teachers, research scholars and other users are more interested to access the required information from such resources rather from print ones. However, due to high subscription rates of these resources, colleges cannot subscribe it and therefore unable to make it available in the library for its stack-holders. To overcome this genuine problem of colleges, the University Library has decided to develop the consortia with the title 'Sant Gadge Baba Amravati University Library Consortia for UG and PG Colleges'. The member colleges of the consortia will get e-resources in the form of packages at affordable cost. At present Indian Journals (UG and PG), Science Journals (UG and PG), Social Science Journals (UG and PG), ProQuest Delnet Management Collection and ProQuest Delnet Engineering and Technology Collection these packages are available for the colleges. It is the unique service extended by the library.

5. User Orientation

Only uploading information on portal for the stack holders is not sufficient. Moreover, the responsibility of library profession is not come to an end here. To aware them about this facility and literate them regarding usage of the portal are equally important. The SGBAU library takes care of it. Academic Staff College of the University regularly holds orientation and refresher courses. The participants spend one full day in the library to know how to use library and access e-resources. They are given special one shot session on library portal with special emphasis on accessing e-resources and retrieval technique. User Education Program is also conducted for the students studying in various departments of the University.

Table 1: Six Monthly Usage Report of the Portal of the University Library

Sr.No.	Period	Number of		
		Visits	Pages Downloaded	Hits
1	January-June 2011	20682	190999	1308840
2	July-December 2011	26147	404382	2287211
3	January-June 2012	35760	452207	2592726
4	July-December 2012	42682	528496	3455815
5	January-June 2013	49178	468336	2994699
6	July-December 2013	61284	467636	3152498
7	January-June 2014	87737	732239	4782105
8	July-December 2014	97011	1099173	5468296
9	January-June 2015	142635	1435485	7605312
10	July-December 2015	140563	1305500	7316276
Total	**703679**	**7084453**	**40963778**	

6. Utility of the Portal

Satisfactory results regarding the utility of the Portal come out because of conducting User Orientation for the stake holders by the library. The usage reports since January 2011 are displayed in the tables. Sixth monthly usage of the portal is given in table 1. It is evident that the usage statistics in terms of visits, hits and pages downloaded is continuously increasing. Moreover, the statistics says that this library is using by the users of more than fifty countries in the world. Amongst, the usage statistics of top ten countries is displayed in table 2.

7. Advantages of Portal

- All information available in the library can be accessed from one place at any time and from any location.
- It is easy to reach up to the end users on the part of library
- It gets satisfaction to professionals to work for the stack holders.
- Library staff becomes more aware in transforming information on portal.
- Time for searching of information can be reduced up to large extent.
- It becomes easy to alert the users regarding current information such as New Arrivals, Current Content page etc.
- The image of the library in the institution as well as in the society can be improved.
- It is easy to link the libraries of affiliated colleges with the University Library
- Library portal reduce the barrier of users having to remember multiple log-ons.
- It gives the library a tool to channel users towards preferred resources.
- It increases the ability of the library to ensure that costly electronic journals and databases are used, by offering a simple way to browse the available resources.
- It supports searching by carrying users through from bibliographic searches to full text options.
- Satisfy the fourth law i.e. 'Save the time of users' up to large extent
- It helps to reduce the gap between users and their information

8. Conclusion

The portal of SGBAU library is continuously updated and having full of information. Therefore the usage of it is continuously increasing not only in Amravati region but also in the country and even in other countries. As stated above the mission of the SGBAU Library is 'Expanding horizon of knowledge and learning by disseminating the information to the end users', the library is trying to reach up to the end users through this portal. The usage statistics shows that the library is succeed in its mission. Of course it could be possible only because of developing the portal and continuously updating the information on it.

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Paradigm Shift of Library in Higher Education: *An Overview*

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Abstract: The attempt of this paper is a general presumption regarding the growth and development of higher education and libraries in India. In 1950 there were only 21 universities in India and now the universities have grown up to 34% (http://mhrd.gov.in/university-and-higher-education). So, the paper deals with the level of expansion of higher education and libraries. It has been strongly argued here that India has to enhance its priority for higher education.

Keywords: Library, Higher Education, University, Colleges

1. Introduction

India has the biggest higher education system in the world after china and unites state. Before 1947 there were very limited enrolment for education in 500 colleges and 20 universities. The growth has been very inspiring; the number of universities in 2006 has increased by 18-times, the number of colleges by 35 times and enrolment more than 10 times (Annual Report, MHRD 2006-07).

In country like India, the government of centre and state are trying to build up a strong network for higher education in the right path to maintain the value education. In 1950-51 there were 20 universities in India and in 2014 there were 677 universities out of which 45 central universities,318 state universities, 185 state private universities, 129 deemed universities,51 Institutions of National repute (established under Acts of Parliament) under MHRD (IITs - 16, NITs – 30 and IISERs – 5) and four Institutions (established under various State legislations). The number of colleges has also registered manifold increase of 74 times with just 500 in 1950 growing to 37,204, as on 31st March, 2013. (http://mhrd.gov.in/university-and-higher-education).

Now the universities across the globe face an imperative to a whole series of thoughtful changes into six major categories: the increased demand for Higher Education in a lifelong learning, the internationalisation of education and research, the need to develop bridge between universities and industry, the creation of places where knowledge is produced, the reorganisation of knowledge, and the emergence of new expectations (European Commission, 2003, Virkus and Wood, 2004a). Changes in Higher Education are so profound that several observers refer to a paradigm shift. **Kathy Tiano** has characterised the old and new paradigms shift of Higher Education as follows:

Old Paradigm for Higher Education	New Paradigm for Higher Education
Take what you can get	Courses on demand
Academic calendar	Year-round operations
University as a city	University as idea
Terminal degree	Lifelong learning
University as ivory tower	University as partner in society
Student = 18- to 25-year-old	Cradle to grave
Books are primary medium	Information on demand
Tenure	Market value
Single product	Information reuse/info exhaust
Student as a 'pain'	Student as a customer
Delivery in classroom	Delivery anywhere
Multi-cultural	Global
Bricks and mortar	Bits and bytes
Single discipline	Multi-discipline
Institution-centric	Market-centric
Government funded	Market funded
Technology as an expense	Technology as differentiator

Source: (Kathy Tiano, cited in Inglis et al, 2002: 22)

2. Roll of Academic Libraries

Libraries have a long history, starting with the closed-access to the present-day hybrid, digital, and virtual libraries that use the latest ICT provision of information through various services. Libraries are the major repositories of knowledge and an integral part of academics to make good citizens. Accordingly, in electronic age the perception of librarians have changed from storekeepers to information scientist, information officers, navigators, and cybrarians who find themselves in the vast ocean of knowledge and are engage in satisfying clients thrust of knowledge anytime and anywhere on single click. (Preeti Mahajan, Academic Libraries in India: a Present-Day Scenario). Due to invent of the

computer and internet, libraries becomes a knowledge dissemination centre in present environment. The complete housekeeping activities of library is managed by the computer and internet i.e. Storage, process, retrieve, maintaining, stock-verification, source tracking and disseminate information. As a result, the conventional idea of library is being converted from print to digital version. In this change library have maintain the third party storage for keeping its data and serve the same at anywhere and anytime through the different mode of services i.e social media, mobile devices, CD ROM facility, internet services and mobile library facilities to provide the qualitative content to its users. In present era libraries are bounded by the networked data which is connected to the ocean of knowledge and internet services. Academic libraries are the core centres of any academic institutions, which support teaching, learning, research and other academic activities. All the function of academic libraries is similar around the globe.

3. Library and Information Paradigm Shift

As academic library is the heart of the academic society. Academic libraries are intensely affected by changes in the academic pedagogy. Thus it is necessary for the library must change with the current scenario of academic changes with the help of latest ICT techniques for proper managing internal change. (CETUS, 1997: 3). Changes in higher education, the new student-centred paradigm and new learning and teaching approaches have also created a need for a re-conceptualisation of the roles and responsibilities of librarians. There is one table that represented the changes in libraries when library was open. The source of the table is given in the end of the table,

S N	THEN	NOW
1	All services available only whe library was "open"	Many services available 24/7
2	Limited technology for individual use by public	Greatly expanded technology for individual patrons
3	Single or individual product workstations	One workstation or network now multi-tasks
4	Change in library services hardware, software and patron need occurs	Change occurs anywhere from every month to every two to three months - constant reassessment is needed once a year or 18 months
5	Strong reliance on print resources	Strong reliance on electronic and print
6	Most things available in print, only indexes available electronically	Full text available electronically and some things now available **only** electronically
7	Patrons have easily identified needs and levels of learning and knowledge	Patrons have dramatically different needs and area on dramatically diverse levels of learning and knowledge, often hard to identify & change rapidly

8	Patrons spend moderate time with print materials and indexes	Patrons spend expanded time on library hardware
9	Traditional services available such as copying	New services added on top of old services such as printing, downloading, basic computer skills such as keyboarding
10	Standard budget categories for buying, record keeping	Additional/expanded categories relating primarily to hardware and software resources
11	Offer library instruction in traditional ways such as tours, one-on-one, handouts	Expanded offerings on top of traditional such as signage, small group instruction, virtual
12	Planning qualitative and quantitative	Planning very data driven, emphasis on strategic
13	Planning for resources annual or bi-annual updates	Rapid change in products drives more frequent updating/greater expenditures
14	Limited hardware/software technology for staff	Greatly expanded hardware and software technology for everyone
15	Not much time spent teaching the tool, rather locating and using content	Now **much** time spent teaching tool or method of finding, etc.
16	Reference in person	Reference in person, virtual, digital, synchronous, asynchronous
17	Fixed, hardwired	Portability
18	Offer only those things we purchase	Offer access to selective resources freely and available
19	Content designed by librarians	Content designed by librarians, patrons, etc. in shared space
20	Library a quiet place with individual seating for study	Noise! Equipment! One-on-one teaching of hardware/software, vying for seating and finding seats without computers at them!

Source: (Dr. Julie Todaro, 21st Century Academic Libraries in Higher Education, 2007-2008 President, Association of College and Research Libraries)

4. Libraries: Supporting the "Business" of Higher Education

Issues	Issues Relates to library	How libraries support higher education
Equality	• Struggle by size and type • Perceptions	Provide resources/multiple access points for all students; assist in serving alumni; provide resources tailored to special pops
Communication	• Standards, protocols, digital/virtual • Varied skills sets; varied Definitions	Design communication networks to reach all users/non-users; push information; assist in delivering seamless access to curriculum; provide basic/advanced online/in-person instruction
Content	• Access • Formats • Standardized platforms • Design, creation, delivery, management • More tech than not/missing Infrastructure	Support diversity in formats, curriculum content, research; design tailored access points for disciplines/access tools faculty and students; assist/partner classroom faculty in the design of curriculum; provide environments for active learning/design of content/info; guide/provide environments for publication; provide repositories
Destination	• Debate over "place" • Virtual/digital – yes • In-person – many same/new Issues	Support student engagement by providing destinations; partner with other support services for one-stop; provide destinations for online users; customize destinations for target audiences (alumni, non-graduates); assess use of resources, services and facilities and their role in engagement and retention
Management	• Vastly different skill levels • Training/Education • Managing remotely • Managing atypical staff (tech) • Managing ages, generations	Focus on coordinating activities among departments (IT, etc.); participate in designing training/education; focus on management of remote environments/staff
Marketing/PR	• Articulating 21st century roles and responsibilities Branding/Co-branding identifying/establishing niches	Articulate the "21st century library and higher education environment; brand and co-brand to engage students and support recruitment and retention
Assessment	• Counting, tracking, successful outcomes	Partner to assess competencies through outcomes assessment; coordinate library outcomes with disciplines; integrate measurement of information literacy

Value	• Value of information, services, expertise; proving worth	Identify value of resources and services in support of specific higher education initiatives such as development; outreach to alumni
Leadership	• Within organizations and institutions • Within communities • Leading remotely	Focus on leading higher education initiatives such as community partnerships and relationships between and across disciplines
Recruitment/ Retention	• Generations • Skill levels • Training/education	Actively partner with recruitment and retention activities; Identify products of library resources and services that assist in recruitment and retention

Source: (Dr. Julie Todaro, 21st Century Academic Libraries in Higher Education, 2007-2008 President, Association of College and Research Libraries)

5. Conclusion

There are so many changes in graduate qualities, massification, technology, flexible delivery and new disciplines drive pedagogical change since last five decade. The changing concepts in education have created the need to reconceptualisation of role and responsibilities of library and librarians. The lecture transmission of rapidly outdated content will continue to give way to a focus on the qualities required by students for employability and lifelong learning. "Academic libraries must continue to redefine their role within the teaching and research missions of their universities. Just as institutions are held accountable for students' success after they leave campus, we may also be held accountable for sending students into careers who are unprepared to function effectively in the complex information environment. We must constantly evaluate our teaching functions and assess student learning outcomes. If not, others will most certainly hold us accountable" (Bundy, Alan, 2003). This will require them to translate their success in local, national and international networking and partnerships to the broader educational arena.

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Usage Analysis of Online Public Access Catalogue (OPAC) by the Research Scholars of CCS Haryana Agricultural University, Hisar and the Means to Promote their Utilization: *A Case Study*

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Abstract: The aim and purpose of this study is to investigate and analysis of the use and usability of OPAC among the doctoral research scholars at Nehru Library of Chaudhary Charan Singh Haryana Agricultural University, Hisar, Haryana, India. The paper examines the result from a questionnaire-based survey conducted at the Nehru Library. A total 100 questionnaires were distributed randomly to the research scholars out of which 93 completed and valid questionnaires were received (93%) and analyzed using the simple percentage analysis approach.

Keywords: Agricultural University Libraries, Research scholars, Library resources, Information skills, ICT, OPAC, Library use.

1. Introduction

21st century is would be acclaimed as the era of Information Technology (IT) for India and most of the developing world. This was the time when the Information Technology started making inroad into the hitherto unreached countries in a big way. Information Technology has remarkable impact on all the sectors of the society. Libraries and information centres are not an exception. Information Technology has brought enormous changes and radical transformation in the function and management of modern libraries. The advent, rapid succession and subsequent widespread use of Information Technologies have completely revolutionized the library system and services. The traditional concepts of libraries are becoming obsolete day by day with the emergence of new digital means of storage and dissemination of information. The IT revolution has changed the traditional library into computerized library, then automated library, then digital library and more recently into a virtual library.

Information Technology has profoundly changed library operations, information resources. Information services, staff competencies and users' expectations. Today, libraries are facing variety of challenges of information explosion, IT revolution and network evolution on one side, decreasing library budgets, increasing cost of print based information resources, growing electronic information resources, emergence of digital/virtual libraries and ever rising users' expectations for complex information requirements on the other side. IT has virtually unlimited potential in enhancing the capabilities of modern libraries not only to meet these challenges but also to satisfy the ever growing demands of users efficiently and effectively. Today every library is striving hard to use modern technologies not only to just automate, but also to increase the efficiency and effectiveness of information services. The effective utilization of emerging technologies has become inevitable for the survival and successful management of modern

libraries in a dynamic digital information environment and global knowledge society. (Ramana, 2013).

2. Online Public Access Catalogue (OPAC)

Library catalogue is the most important tool to locate reading materials in the library. In other words we can say Catalogue is a Key of Library. Catalogue show the total holding of the library. Generally in computerized library catalogue is known as Online Public Access Catalogue (OPAC). OPAC provides easy access to the library catalogue through computer. OPAC is a computerized database of the library holdings, which can be searched in many powerful ways than manual card catalogue. OPAC is also known as a gateway to find information in libraries and provides facilities to browse, search and locate information. OPAC also shows the current status of a book, whether it is available on the shelf or issued. If issued, the book can also be reserved. OPAC also provides remote access from outside the library through Local Area Network (LAN) or from anywhere in the world through web/Internet is called Web-OPAC. The OPAC or Web-OPAC provides simple and advanced search facility to search an item by author, title, corporate body, conference name, subject headings, keywords, class number, series name, accession number or combination of any of two or more.

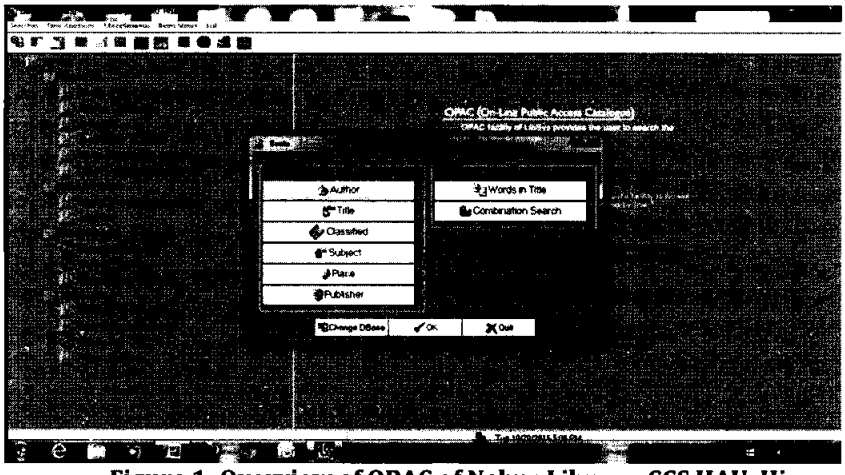


Figure 1: Overview of OPAC of Nehru Library, CCS HAU, Hisar.

3. Nehru Library-CCSHAU, Hisar-A Profile

Nehru Library is a central facility, which caters to the informational requirements of the students, teachers, research scholars, extension specialists and other staff of the CCSHAU (Chaudhary Charan Singh Haryana Agricultural University) as well as LUVAS (Lala Lajpat Rai University of Veterinary and Animal Sciences) located at Hisar and other parts of the State of Haryana. Library collections at the College of Home Science at Hisar and College of Agriculture at Kaul, 17 Krishi Vigyan Kendras, 6 Regional Research Stations and about 90 other Departmental and Administrative Units of the University are maintained separately.

Though the establishment of this Library coincides with the establishment of College of Veterinary Sciences in 1948, the year 1975 is a land-mark in its history, as the present library building - named after Jawaharlal Nehru, the first Prime Minister of India – was officially dedicated to the university community in this year. Library building has the capacity to accommodate more than 3.5 lakh volumes of books and bound journals, Reading Halls with capacity to accommodate 650 readers, a Night Reading Hall, 21 Carrels for research scholars and scientists, 6 Seminar Rooms, a Browsing Hall, a Bookshop, an Exhibition Hall, a Committee Room, 10 Office Rooms, Bindery and spacious Lobbies, Video-Conferencing Room. (hau.ernet.in, 2015).

Table 1: Current State of the Nehru Library, CCSHAU, Hisar

Information Resources	Qty.
Books	238282
Periodicals	101794
Thesis	11969
CD-ROM (Databases)	153
CDs (Books)	2459
CDs (Thesis)	1590
Total	**356247**
Library Membership	**6109**

Source: Annual Report, Nehru Library, 2014-2015, p. 8

4. Automation of Nehru Library, CCSHAU, Hisar:

Research, Planning and Development Division of Nehru Library was set up to plan and develop something innovative so as to provide prompt and latest information to the users. Automation of Nehru Library started with the advent of this division wherein application of computer and other automated technologies were started to activities such as Acquisition of books, Subscription of printed and e-journals, Cataloguing of current acquisitions & display of new additions, Retro-conversion of the Library Catalogue, Bar coding of documents, Circulation of books and other reading material, Linkage of Online Catalogue to the university website, Acquisition of CD-ROM databases, etc. Nehru Library has been using LibSys software for its automation work. Nehru Library has its own Portal which is linked to the University's website. Starting with one PC in 1991, the Library, now has 108 PCs/ workstations, 8 Thin clients, 7 Servers including one CD server called NAStorage, 2 Scanners, 11 Barcode Readers, 1 Modem, 34 UPSs, 33 printers and 9 Software (UNIX, LINUX, LibSys, KOHA, MS-Office-2003, MS-Office-2007, Adobe Acrobat -9 and E-quest), 3 Network Switches, 2 Network Switch Racks, 31 Head Phones, Three Desktop Switch (8 Ports), 5 Portable Data Terminals (PDT), etc. These equipments were used by the

library staff for library automation activities and library users to access online database of books & periodicals, CD-ROM databases, Internet and Multimedia Library.

5. Objectives of the Study

- To identify the information needs of research scholars.
- To study the status of OPAC facility at the Nehru Library, CCS HAU, Hisar.
- To find out the purpose of use of OPAC.
- To assess and measure the users opinion on the OPAC services keeping in view the changing networked environment.
- To examine and analyze the user search pattern and search strategy on OPAC.
- To determine the extent to which students utilize the OPAC.
- To identify the challenges faced by the research scholars when using the OPAC.
- To ascertain the level of satisfaction with OPAC use.
- To suggest the solutions to overcome the problems being faced by the research scholars.

6. Scope of the Study

The scope of the present study is confined to only research scholars (PhD. Students) of Chaudhary Charan Singh Haryana Agricultural University, Hisar. The population of the study is limited to 100 research scholars of different disciplines of Agricultural Sciences, Veterinary Sciences, Basic Sciences and Humanities and Home Science. In the context of this paper the OPAC is meant for accessing the catalogue information that is bibliographic description of holding in the library.

7. Methodology

Keeping the above-cited objectives and scope in view, the research plan was drawn, and to collect the comprehensive and relevant data, a questionnaire method was applied. Random sampling technique was used in this study. Accordingly the questionnaires were administered to the research scholars into the Nehru Library and responses of the research scholars were solicited. A total of 100 questionnaires were distributed to the research scholars in the Nehru Library in the month of August-September 2015, out of 100 questionnaires, 93 questionnaires were received from the respondents. Thus form the response rate of 93%. The questionnaires sought information on the state of automation, use of OPAC, problems identified by the research scholars in using the OPAC, frequency of using the OPAC, search behavior of the research scholars and comments on the ways of improving the use of OPAC as an information retrieval tool.

8. Analysis and Interpretation of the Data Collected:

Analysis of data is the ultimate step in the research process. It is the link between raw data and significant results leading to conclusions. This process of analysis has to be result oriented.

Table 2 - Distribution of questionnaires and the responses received

Category of Users	No. of Questionnaires Distributed	No. of Questionnaires Received	% of Response
Research Scholars	**100**	**93**	**93%**

The questionnaires were distributed to the Ph.D. research scholars and the responses received from them are presented in Table 2. From the Table 1, 100 questionnaires were distributed to the research scholars registered in Agricultural Sciences, Veterinary Sciences, Basic Sciences, Home Science, Food Science and Technology and the response rate was achieved 93%.

Table 3: Gender-wise distribution of respondents

Category of Research Scholars	Total no. of Research Scholars	% of Response
Male	51	54.83
Female	42	45.17
Total	**93**	**100**

Table 3 exhibits that 51 (54.83%) research scholars were males and 42 (45.17 %) were females who were given their response positively.

Table 4: Research experience of Research Scholars

Research Experience in Years	Total no. of Research Scholars	% of Response
Newly entrant	20	21.50
Less than 2 years	41	44.09
2-4 years	25	26.88
More than 4 years	07	7.53
Total	**93**	**100**

Table 4 depicts that majority of research scholars are beginners in the research work, i.e., 41 (44.09%) having research experience of less than 2 years, followed by 25

(26.88%) having research experience of 2 to 4 years, and 20 (21.50%) having no research experience and they are newly entrant to the field of research of their concerned area of the subject. It is clear from the table above that only 07 research scholars (7.53%) are having research experience of more than 4 years.

Table 5 - Frequency of OPAC Usage

Frequency	Total no. of Scholars	Research% of Response
Everyday	14	15.06
Once in a week	21	22.58
Twice in a week	08	8.60
Once in two weeks	25	26.88
Once in a month	15	16.13
Occasionally, when required	10	10.75
Total	**93**	**100**

It is important to know how frequently the users use OPAC to locate their required documents in the library. The frequency of using OPAC indicates its value and effectiveness in the library. Table 4 showed that a majority, i.e. 25 (26.88 %) of the research scholars were using it once in two weeks, 21 (22.58%) of the research scholars used it once in a week. 15 (16.13%) used it once in a month and 14 (15.06%) used it daily. Similarly 8 (8.60%) of the research scholars used it twice in a week, and 10 (10.75 %) of them used it occasionally, when they required.

Table 6 highlights the various purposes of using OPAC by the research scholars. It is clear from the above table that a big majority of the research scholars, i.e., 85 (91.39%) consulted the OPAC to know the location of the required documents followed by 77 (82.79%) were using OPAC to locate the theses / dissertations in the library and 49 (52.68%) to know the availability of required document in the library. Similarly, 40 (43.01%) research scholars consulted the OPAC to know what a library have on a given author, title and subject followed by 39 (41.93%) to know the check outs of the particular documents, 38 (40.86%) to know the latest / new addition list of the documents, 33 (35.48%) to know whether required document is issued or not means whether the required document is/are available in the library or not, 26 (27.95%) to check the number of copies of the required document in the library respectively. 22 (23.65%) research scholars were using the OPAC to know about state and location of CDs/DVDs of particular document available in the library or not, whereas 19 (20.43%) were using OPAC to find the bibliographical details of the required document.

Table 6 - Purpose of Using OPAC

Purpose	Total no. of Research Scholars (n=93)	% of Response
To know the availability of required document	49	52.68
To know whether required document is issued or not	33	35.48
To know the location of required document	85	91.39
To check the number of copies of the required document in the library	26	27.95
To find the bibliographical details of the required document	19	20.43
To locate the theses / dissertations in the library	77	82.79
To know about state and location of CDs/DVDs of particular document available in the library	22	23.65
To know the latest/new addition list	38	40.86
To know what a library have on a given author, title and subject	40	43.01
To know the check outs	39	41.93
To reserve the document or to know the status of reservation	11	11.82
To know the complete history of check out, check in and reservation	08	8.60
To give the recommendation to the library for purchase of the title/book	16	17.20

Note: Multiple choices given

To give the recommendation to the library for purchase of particular title/book is purpose for 16 (17.20%) research scholars, to reserve the document or to know the status of reservation for 11 (11.82%), and to know the complete history of check out/check in and reservation for 8 (8.60%) research scholars are some other purposes to consult the OPAC.

Table 7 – Methods Used by Respondents to Access the Information

Methods Use for Locating Documents	Total no. of Research Scholars	% of Response
OPAC	81	87.10
Manual	05	5.38
Both	07	7.52
Total	**93**	**100**

Table 7 shows how the users chose their books and other materials for their study. Analysis shows that the maximum number of research scholars, i.e., 81 (87.10%) chose the OPAC for finding information about desired books and other reading materials, followed by 7 (7.52%) were using both methods for access information, and only 5 (5.38%) research scholars were using manual methods for access information or locate the documents. It is clear from the above table that majority of research scholars prefer to use the OPAC for access to their desired information resources.

Table 8 - Sources of Guidance for Using Library OPAC

Sources of Guidance	Total no. of Research Scholars (n=93)	% of Response
Through orientation program	21	22.58
Through library guidelines	38	40.86
Through library staff	59	63.44
Through friends or fellow researchers	42	45.16
Through literacy program (PGS-501 course)	76	81.72

Multiple choices given

Table 8 reveals the various sources of guidance for using and learning the library OPAC. It shows that literacy program (PGS-501- Library and Information Services) conducted by the library is the main source of guidance for using and learning about library OPAC for majority i.e., 76 (81.72%) of research scholars. Similarly, 59 (63.44%) research scholars responded that they have received guidance of library staff for using library OPAC efficiently, followed by through friends or fellow researchers, i.e., 42 (45.16%), through library guidelines or rules, i.e. 38 (40.86%) and through orientation program for 21 (22.58%) research scholars respectively.

Table 9- Approaches for Access to Information Using OPAC

Approaches	Total no. of Research Scholars (n=93)	% of Response
By Author	59	63.44
By Title	72	77.41
By Class Number	18	19.35
By Subject	41	44.08
By Key Words	50	53.76
By Publisher	12	12.90
By ISBN/ISSN	05	5.37
By Place of Publication	05	5.37
By Combination Search	09	9.67

Multiple choices given

Table 9 depicts the respondents various approaches to confirm about the existence of required documents in the library collection and access the same by using OPAC. Most of the respondents access OPAC through title, i.e., 72 (77.41%), followed by author, i.e., 59 (63.44%), keywords, i.e., 50 (53.76%), subject, i.e., 41 (44.08%), class number, i.e., 18 (19.35%), and only 09 (7.50%) research scholars approach through class numbers respectively. While publisher approach for 12 (12.90%) research scholars and remaining by combination search 9 (9.67%), and only 5 (5.37%) each research scholars approached through ISBN/ISSN and place of publication.

Table 10 – Time spent to search OPAC

Time Spent	Total no. of Research Scholars	% of Response
Less than Half Hour	49	52.68
Half Hour to an Hour	36	38.71
More than an Hour	08	8.61
Total	**93**	**100**

Table 10 highlights the average time spent by the research scholars on searching OPAC. Majority of the research scholars, i.e., 49 (52.68%) spent less than an hour to consult

the OPAC, followed by the those who spend upto one hour, i.e., 36 (38.71%), and only 08 (8.61%) research scholars were spend more than an hour for the use of OPAC.

Table 11- Problems faced by Research Scholars for not using OPAC

Problems faced by Research Scholars	Total no. of Research Scholars	% of Response
Lack of Knowledge/Skills to use OPAC	23	24.74
Lack of Awareness	18	19.35
Complicated to Use	11	11.83
Slow Speed	08	8.60
Lack of OPAC terminals	16	17.20
Lack of assistance from library staff	07	7.53
No output due to wrong entries in software	10	10.75
Total	**93**	**100**

Table 11 shows the reasons for not using the OPAC services properly by the research scholars. It is found that 23 (24.74%) research scholars were responded that they have lack of knowledge or skills to use OPAC properly. Similarly, 18 (19.35%) responded that they have lack of awareness about the OPAC.

Whereas, 16 (17.20%) research scholars expressed that there is lack of OPAC terminals in the library followed by complicated to use, i.e., 11 (11.83%), no output due to wrong entries in software, i.e., 10 (10.75%), slow speed of computer terminals, i.e., 8 (8.60%) and lack of assistance from library staff, i.e., 7 (7.53%) research scholars responded respectively.

Table 12 – Satisfaction Level in Searching OPAC

Satisfaction Level	Total no. of Research Scholars	% of Response
Highly Satisfied	23	24.73
Satisfied	48	51.62
Partially Satisfied	17	18.27
Not Satisfied	05	5.38
Total	**93**	**100**

Table 12 exhibits overall satisfaction level of users in using OPAC. It highlights that out of 93 responded research scholars, almost half of the responded research scholars, i.e.,

23 (24.73%) were highly satisfied with OPAC use. More than half of the respondents, i.e., 48 (51.62%) were quite satisfied and 17 (18.27%) were partially satisfied with OPAC use. A few number of research scholars were responded that they were not satisfied with OPAC use or facility. Evidently, it is clear that a large portion of users is satisfied (Highly satisfied and satisfied) with OPAC working and services.

9. Major Findings of the study

On the basis of data analysis, some of the findings are given as under:

- Majority of research scholars are beginners in the research work and having research experience of less than 2 years.
- More than one third, i.e., 25 (26.88 %) of the research scholars are using OPAC once in two weeks and 21 (22.58%) of the respondents using it once in a week.
- A big majority of the research scholars, i.e., 85 (91.39%) consult the OPAC to know the location of the required documents and 77 (82.79%) are using OPAC to locate the theses / dissertations in the library.
- Maximum number of research scholars, i.e., 81 (87.10%) chose the OPAC for finding information about desired books and other reading materials instead of manual method of searching required information resources.
- 76 (81.72%) of research scholars responded that mandatory literacy program (PGS-501- Library and Information Services) conducted by the library is the main source of guidance for using and learning about library OPAC.
- Most of the respondents, i.e., 72 (77.41%) access OPAC through title, 59 (63.44%) access OPAC through author and 50 (53.76%) through keywords approach.
- 49 (52.68%) research scholars spend less than an hour to consult the OPAC.
- One fourth, i.e., 23 (24.74%) research scholars said that they face problems while searching or operating OPAC because they have lack of knowledge or skills to use OPAC properly.
- Majority of the research scholars are satisfied (Highly satisfied-24.73% and satisfied-51.62%) with OPAC working and services.

10. Suggestions

Based on the findings, here some of the suggestions may be given as under:

- Add more computer terminals with OPAC facility so that users can get benefited with enhanced OPAC facility.
- Library staff should be actively and positively support and given assistance to the users while using OPAC so that users can learnt how to use OPAC properly and get their desired information easily.

- Orientation programs should be organizes frequently to the various users groups.
- Data entry staff or technical staff, should have improved data entry skills so that information shown in the OPAC correctly.

11. Conclusion

The study has dealt with the effect and constraints of using the Online Public Access Catalogue (OPAC) among the research scholars. The study concludes that majority of research scholars were agreed that the OPAC is faster and easy mode of searching information than the manual catalogue. This is due to the fact that respondents seek up-to-date information to augment their research work and on latest research methods that they can apply. The use of OPAC by research scholars has increased their information, retrieval rate especially in locating books, thesis and other reading materials in the library. This is evident in the fact that all the research scholars are satisfied with their search outputs and OPAC facilities. Services with smile is the motto of the libraries, so the libraries should keep this in mind and cooperate more and more with their users of various interests unless they are not satisfied. The responsibility lie in the hands of the Reader Services Division of the library to ensure that, the OPAC is available for use, research scholars, students and faculty members are taught how to use it efficiently, and the constraints highlighted in the study are taken care of.

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Use of e-journals provided under UGC-INFONET Consortium to Guru Jambheshwar University of Science & Technology, Hisar: *An analysis*

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Abstract: University libraries and other research institutes are now forced to subscribe electronic journals to meet out the informational requirements of their patrons because of various benefits over printed journals. The Ministry of Human Resource Development, Government of India is providing the financial assistance, through many channels, to universities and other Institutes of Higher Learning. UGC- INFONET, AICTE-INDEST and many more Consortia have been formed with the primary aim to subscribe the electronic information resources. The INFLIBNET and AICTE provided the access of electronic journals to Guru Jambheshwar University of Science & Technology (GJUST) under INFONET and INDEST consortia respectively. The present paper describes the use of electronic journals provided to GJUST under UGC-INFONET consortium during the year 2014. More than 34% articles have been downloaded from single publisher whereas 7 publishers are such whose individual share in total downloads is less than 2%. The paper highlights monthly use of electronic journals from various publishers and suggests the ways to improve the usage level. The paper also enumerates all those journals from where more than 100 articles have been downloaded.

Keywords: Electronic Journals, Library Consortium, UGC-INFONET,

1. Introduction

Guru Jambheshwar University of Science & Technology, Hisar is a State Technical University in Haryana having a dedicated team of well qualified faculty members engaged in teaching and research activities in the fields of Computer Science & Engineering, Information Technology, Electronics & Communication Engineering, Printing Technology, Bio Medical Engineering, Mechanical Engineering, Pharmaceutical Sciences, Physiotherapy, Applied Psychology, Physics, Chemistry, Mathematics, Management, Environmental Sciences & Engineering, Food Technology, Bio and Nano Technology, Communication Management & Technology, The faculty published total 1935 papers in various peer reviewed journals of national and international repute since 2009-10. Out of these publications, 1219 publications are listed on Scopus till 2013-14, and more so, 755 publications were listed since 2009-10. As per Scopus database, the Citation Index and H-Index of the faculty range up to 466 and 28, respectively, while the Impact Factor of the papers is up to 6.05.

2. Objectives of the Study

This study is basically concerned with the use of electronic journals provided by INFLIBNET to GJUST under UGC-INFONET Consortium. The objectives of the study are:

- To know the month-wise usage of electronic journals from various publishers.
- To know the highly used journals

- To identify such journals from where at least 100 articles have been downloaded.
- To give possible suggestions to improve the usage level of electronic journals in GJUST.

3. Methodology

The present study is carried out by taking the usage data from the UGC-INFONET Consortium related to month-wise downloads of articles from electronic journals during the year 2014.

Table 1: Publishers wise monthly detail of downloaded articles during Jan-Dec 2014

Database	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Pub. wise Monthly Average	Total	%
Springer Link	1065	1092	1303	875	1029	534	527	809	**1595**	1001	1319	1288	1036	**12437**	35.4
Wiley-Blackwell	423	357	602	630	572	299	328	555	693	183	498	315	455	**5455**	15.5
Taylor and Francis	616	636	493	446	404	281	278	353	546	278	588	409	444	**5328**	15.2
JSTOR	518	380	562	628	1089	187	327	120	383	183	446	306	427	**5129**	14.6
American Chemical Society	278	197	262	254	273	229	314	261	363	178	338	311	272	**3258**	9.3
American Institute of Physics	47	17	78	90	108	79	145	140	273	87	78	165	109	**1307**	3.7
Royal Society of Chemistry	8	15	1	14	0	1	0	24	229	62	62	140	46	**556**	1.6
Institute of Physics	4	3	2	0	0	0	5	52	106	164	104	68	42	**508**	1.4
OUP	19	11	9	18	1	3	6	26	103	39	80	84	33	**399**	1.1
American Physical Society	26	62	13	73	86	7	10	0	25	10	14	14	28	**340**	1.0
Cambridge Uni. Press	14	19	32	16	41	3	25	37	16	7	5	15	19	**230**	0.7
Annual Reviews	5	25	16	22	7	16	6	4	10	6	5	5	11	**127**	0.4
ProjectMuse	3	4	7	2	17	2	1	2	1	2	13	1	5	**55**	0.2
Grand Total	**3026**	**2818**	**3380**	**3068**	**3627**	**1641**	**1972**	**2383**	**4343**	**2200**	**3550**	**3121**	**2927**	**35129**	**100**

1. Analysis and Interpretation of Data:

Table 1 gives the month-wise comprehensive view of the use of electronic journals from 13 publishers provided under UGC-INFONET Consortia arrangement to Guru Jambheshwar University of Science & Technology, Hisar. The table is sorted from highest number of total articles downloaded during the year 2014. Total 35129 number of articles

have been downloaded during the period of 01/01/2014 to 31/12/2014 from all the 13 databases of electronic journals. It is evident from the Table 1 that highest 12437 and lowest 55 articles, at a monthly average of 1036 and 5 articles, have been downloaded from 'Springer' and 'Project Muse' respectively. Figure 1 show that out of total 35129 downloaded articles, the highest numbers of 12437 articles have been downloaded from Springer database whereas only 55 articles have been downloaded from Project Muse. Likewise Figure 2 represents the corresponding percentage share of all databases which ranges from 35.4% to 0.2%.

It is to be noted that 35.4% articles have been downloaded only form Springer database followed by Wiley-Blackwell, Taylor and Francis and JSTOR where total number of 5455, 5328 and 5129 articles have been downloaded having the percentage share of 15.5, 15.2 and 14.6 respectively. These are the four publishers whose total downloaded articles are more than 5000 and total share of downloaded article is more than 10%. Next came American Chemical Society and American Institute of Physics with a share of 9.3% and 3.7% respectively. No other database could obtain share of even 2%. Project Muse has the lowest percentage share of 0.2%. In a particular month, as also shown in Figure 3 and Table 1, highest 4343 articles and lowest 1641 articles have been downloaded in the month of September and May respectively against the overall monthly average of 2927 articles.

Table 2: Publishers-wise details of downloaded articles: More than 5000

Database	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Total
Springer Link	1065	1092	1303	875	1029	534	527	809	1595	1001	1319	1288	1036	12437
WileyBlackwell	423	357	602	630	572	299	328	555	693	183	498	315	455	5455
Taylor and Francis	616	636	493	446	404	281	278	353	546	278	588	409	444	5328
JSTOR	518	380	562	628	1089	187	327	120	383	183	446	306	427	5129

Table 2 shows the month-wise detail of downloaded article from top four such databases of electronic journals whose sum of downloaded articles are more than 5000. It has been observed that amongst all four databases, the highest number of 12437 articles from Springer and lowest 5129 articles form JSTOR have been downloaded. Further, highest numbers of 1595 articles have been downloaded during September month from Springer whereas lowest numbers of 120 articles have been downloaded in August from JSTOR database during the month of August. The monthly average of 1036, 455, 444 and 427 articles have been observed of Springer, Wiley-Blackwell, Taylor and Francis and JSTOR publishers respectively.

Table 3: Publishers-wise details of downloaded articles: Less than 5000 but more than 500

Database	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Total
American Chemical Society	278	197	262	254	273	229	314	261	363	178	338	311	272	3258
American Institute of Physics	47	17	78	90	108	79	145	140	273	87	78	165	109	1307
Royal Society of Chemistry	8	15	1	14	0	1	0	24	229	62	62	140	46	556
Institute of Physics	4	3	2	0	0	0	5	52	106	164	104	68	42	508

Total 3258, 1307, 556 and 508 articles have been downloaded respectively from American Chemical Society, American Institute of Physics, Royal Society of Chemistry and Institute of Physics databases. These are such 4 publishers whose total number of downloaded articles is more than 500 but less than 5000.

Table 3 show the month-wise detail of downloaded article from these databases of electronic journals. A peep on the table and figure discloses that highest number of 363 articles have been downloaded from American Chemical Society during September whereas no article could be downloaded during the months of May & July from Royal Society of Chemistry and during the months of April, May & June from Institute of Physics. Monthly average of 272, 109, 46 and 42 articles from American Chemical Society, American Institute of Physics, Royal Society of Chemistry and Institute of Physics respectively have been observed.

Table 4: Publishers-wise details of downloaded articles less than 500 but greater than 50

atabase	Jan	Feb	Mar	Apr	a	Jun	July	Aug	Sep	Oct	Nov	Dec	Average	otal
xford Uni. Press	19	11	9	18	*1*	3	6	26	103	39	80	84	33	399
merican Physical Society	26	62	13	73	36	7	10	0	25	10	14	14	28	340
ambridge Uni. Press	14	19	32	16	41	3	25	37	16	7	5	15	19	230
nnual eviews	5	25	16	22	7	16	6	4	10	6	5	5	11	127
roject Muse	3	4	7	2	17	2	*1*	2	*1*	2	13	*1*	5	55

Table 4 show the month-wise detail of downloaded article from such 5 publishers whose total number of downloaded articles is less 500 but greater than 50. Total 399, 340, 230, 127 and 55 articles have been downloaded during the year 2014 from Oxford University Press, American Physical Society, Cambridge University Press, Annual Reviews and Project Muse respectively at an average of 33, 28, 19, 11 and 5 articles per month. It has also been observed that highest number of 103 articles have been downloaded from Oxford University Press during the month of September whereas during the months of May only 1 article could be downloaded from this database. July, September and December months are also the witness to show that only 1 article per month has been downloaded from Project Muse. An attempt has been made to sort the list of electronic journal as per the usage level from high to low.

Figure 1 represents 6 such journals which are highly used and more than 400 articles from each journal have been downloaded. Out of total downloaded 35129 articles, 3184 articles i.e. 9% articles have been downloaded from these 6 journals.

Figure 1: Journal-wise details of downloaded articles: More than 400

On an average 531 articles annually or 44 articles monthly have been downloaded from these 6 journals. Highest 468 articles and lowest 120 articles have been downloaded from all six journals in the months of September and February and the corresponding

monthly average is 78 and 20 articles. Highest 144 and lowest 3 articles have been downloaded from 'Journal of Applied Physics' and 'Applied Physics Letters' during the months of September and February respectively.

Figure 2 represent the list of journals where total downloads are less than 400 but equal or greater than 200. Total 2434 articles have been downloaded from 9 such journals during 2014 at a monthly average of 203 articles. A peep on the table exposes that, amongst these 9 journals, highest 340 articles and lowest 200 articles have been downloaded from 'Journal of Applied Polymer Science' and 'Journal of Business Ethics' respectively. Highest 131 articles, in a particular month, have been downloaded in September from 'European Journal of Applied Physiology' whereas no article has been downloaded from 'Food and Environmental Virology' in July, from 'Indian Journal of Industrial Relations' in August and from 'European Journal of Applied Physiology' in January, April, June, August and October. Highest number of 312 and lowest number of 88 articles have been observed in the months of September and July respectively against the annual monthly average of 203 articles. Likewise, highest and lowest monthly averages of 35 and 10 respectively have been observed in September and July respectively against the annual average of 23 articles.

Figure 2: Details of downloaded articles: More than 200 but Less than 400

Figure 3 represent the list of journals where total downloads are less than 200 but equal or greater than 150. Total 2248 articles have been downloaded from 13 such journals during 2014 at a monthly average of 196 articles. Figure 9 shows that, amongst these 13 journals, highest 196 articles and lowest 150 articles have been downloaded from 'Journal of Radio analytical and Nuclear Chemistry' and 'Journal of Thermal Analysis and Calorimetry' respectively. Highest 78 articles, in a particular month, have been downloaded in September from 'Journal of Coordination Chemistry' whereas no article has been downloaded from 'Journal of Radio analytical and Nuclear Chemistry' in February, from 'Physical Review B' in August, from 'AAPS Pharm SciTech' in October and from 'Desalination and Water Treatment' in April, June, August, October, November and December. Total highest number of 403 and lowest number of 81 articles have been observed in the months of September and October respectively against the annual average of 196 articles.

Figure 3: Details of downloaded articles: More than 150 but Less than 200

Figure 4 represent the list of journals where total downloads are less than 150 but equal or greater than 100. Total 1683 articles have been downloaded from 14 such journals during 2014 at a monthly average of 140 articles. Figure 9 shows that, amongst these 14 journals, highest 148 articles from 'Journal of Thermal Stresses' & 'Wireless Personal Communications' and lowest 100 articles from 'Phosphorus, Sulfur, and Silicon and the Related Elements' have been downloaded. Highest 48 articles, in a particular month, have been downloaded in December from 'Archives of Pharmacia Research'. Total highest number of 244 and lowest number of 63 articles have been observed in the months of

September and June respectively against the annual average of 120 articles and at a monthly average of 10 articles. Likewise the highest average of 17 articles in September and lowest average of 5 articles have been observed in June.

Figure 4: Details of downloaded articles: More than 100 but Less than 150

Figure 5: Details of downloaded articles: Less than 100 but more than 10

Figure 5 represent that there are 10 journals out from 91 to 100 articles have been downloaded. Highest 11-20 articles have been downloaded from 338 journals each whereas lowest 61-70 articles have been downloaded from and 8 journals each. Total 631 articles have been downloaded from less than or equal to 100 but more than 10 journals.

Figure 6: Details of downloaded articles Less than 10

Figure 6 represents the number of such journals out from which 1 to 10 numbers of articles have been downloaded. It is observed that there are 981 journals out from which only single article has been downloaded. Likewise, lowest 64 number of journals are such from which 8 articles have been downloaded. Thus there are 2793 journals out from less than or equal to 10 articles have been downloaded.

It is observed from the study that more articles have been downloaded in the month of September and May but lesser in the month of June, July & August. The overall monthly average of downloaded average has been observed 2927 articles. The downloads higher than average have been observed in the months of September, May, November, March, December, April and January whereas lesser than average downloads have been observed in the months of June, July, October, August, and February. The main reason for low downloads is summer and winter breaks. There is no software in the library through which the journals can be accessed out of University Campus.

5. Suggestions

Keeping in view the facilities available in the university, the usage level is just satisfactory. The faculty members of the university have been provided computer systems/ laptops with internet connection in their respective rooms in the teaching departments. University has sufficient computer systems with internet connections and 2 leased lines of 1 GBPS and 16 MBPS respectively and has Wi-Fi connectivity but the university authorities need to enhance the facilities is need to give attention on some points such as:

- More access point should be made available in the teaching department in order to enhance the usage level of e-journals.

- University should purchase/subscribe the software through which the researchers can the access the journals off the university campus.
- The Wi-Fi connectivity available in the campus need to be strengthens. The present Wi-Fi facility is not effective and need to be replaced with good one. Connections generally break while working. More so, this facility is not available in the new campus of the university where about 100 faculty members/ research scholars reside. There is great need to provide Wi-Fi facility in new campus and to replace the existing Wi-Fi facility in old university campus and hostels.
- Centralized internet labs need to be strengthening in the university in addition to the internet labs in the respective teaching departments. This will help the users to work in the labs when the departments get closed and during the holidays.
- More e-journals databases- including the ScienceDirect, Nature, SciFinder, should be provided in the university.
- There is urgent need for conducting the user awareness program to train the users in searching and downloading the required article. Since good infrastructural facilities are available in the university, there is dire need to motivate the users to use these resources. Such user awareness programs shall be helpful in imparting training and motivating the scholars for using electronic resources.
- The usage level must be reviewed on quarterly or half yearly basis in order to take necessary steps for enhancing the use of electronic journals.

6. Conclusion

There is immense need to improve the usage level of e-journals. The GJUST is established as first technical university in the country in the year 1995. The research publication, Citation Index and H-Index are quite good. Access of internet over desktop of faculty members has been provided. Many times it is requested to provide the access of ScienceDirect, Nature, SciFinder, ASTM, ACM Digital Library but the access of these databases is to receive. If the access of these databases is provided, the quality, quantity, Citation Index and H-Index shall definitely be increased. I found faculty members for requesting INFLIBNET to provide the articles through document delivery service. The interaction between library and university authorities for planning the policy user awareness programmes for faculty members and research scholars shall definitely lead to increase in the usage level of electronic journals.

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Use of Electronic Resources by the Faculty Members of Engineering College Libraries in RTM Nagpur University Area: *A Study*

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Abstract: The engineering education is important for development of any country. The faculty members of engineering college are very much needed for the scientific advancement of the country. To make them accomplish and innovative in the workforce, information is vital to access and keeps abreast with the new developments. In this there is great need of electronic resources these days. In view of this importance is being given to user studies know about their use perception, satisfaction, motivation, expectations, etc. So for no survey/study has been undertaken to know the usefulness of these e-resources including this reference. In view of these considerations the researcher undertook an study on the use of e-resources by faculty members of engineering college libraries to know the e-resources usages pattern amongst faculty members of engineering colleges. The study also explores the satisfaction level of the user with the e-resources facility provided by engineering college libraries. The study has particularly been taken up to access the benefits of e-resources over conventional document.

Keywords: use of e resources, engineering colleges, use study

1. Introduction

The innovation in information technology service today it has become a common place for computer application in information processing and retrieval. The technological innovations like networking, Internet, e-mail services, etc., have made information accessible to the user community in the world. The libraries are aggressively switching over to the digital libraries by adding more and more e-resources to their users. The web revolution has a tremendous impact on libraries in general and on the collection development in particular. With the success of full-text on-line journals and e-books, the users started demanding addition of more and more e-resources to the libraries. E-resources play an important role in libraries throughout the world. In the recent past, librarians as well as publishers thought e-resources can be managed very easily. Today, students in engineering have got access to computer and internet facilities and they search on the web. This has changed the way of thinking, their learning methods and visualization of the facts and theories.

2. Objective of Study

- To know the different types of e-resources and services available in the library covered under the survey.

- To study the purpose and frequency of using the e-resources use of the faculty members.
- To study the purpose and frequency of using the e-resources and services available in the library.
- To locate the problem faces by users while accessing and using the e-resources.
- To study the impact of e-resources and services on the academic working the faculty members.
- To know the productivity and quality of information retrieval to e-resources.

3. Scope and Limitations of the Study

The study included only those engineering college which are engaged in imparting degree level courses (B.E.) in the field of engineering & technology. Conclusion and generalizations have been drawn on the basis of the information collected through questionnaire from limited number of 42 Government Aided and Non-aided Colleges of RTM Nagpur university area.

4. Research Methodology

At first the pilot study was conducted to test the feeling of the respondents and library observations. The study represents on exploratory-cum-descriptive research design. The basic purpose of the present study is on the use of e-resources by faculty members of engineering college libraries; an attempt is also made to reveal the key role of libraries.

5. Data Analysis

The data collected through questionnaire was classified under meaningful heads and necessary tabulation was made. The research problem was best characterized as being in the interpretive tradition, favoring qualitative methods of data collection and analysis. An interpretive, rather than a positivistic one, was considered appropriate due to the indeterminate nature of the research problem. The response rates to the questionnaires do not include the pilot study responses. The responses received to the all two questionnaire-I Librarian, total number of 43 responses has been received out of 49. For faculty member's questionnaire-II total responses have been received 365 out of 490 questionnaires. The received data in the questionnaires from 365 faculty members and 43 librarians, which the data was entered into Excel sheet of MS-Office application software with different files under each faculty members and librarians.

- **Distribution of Engineering Colleges:** The district-wise distribution of engineering colleges with respective numbers has been shown in following table 5.1 the engineering colleges affiliated to RTM Nagpur University, Nagpur. Nagpur district have 35 colleges, 01 college in Gondia, Bhandra and Gadchroli while 04 colleges in Chandrapur and 06 colleges in Wardha District.

- **Response of Faculty Members:** The data obtained through questionnaire received from 365 members were analyzed for finding the number of respondents from different colleges under study. The details of name and number of respondents with their percentages were shown in table 5.3.
- **Responses of faculty members by their Age:** Distribution of faculties according to their age in years reveals that 51.51% of the faculties were in the age of 21-30 years, 43.56% in the age group of 31-40 years, 4.11% were in the age group of 41-50 years and only 0.82% of faculties were belonging to the age of 51-60 years. Mean age of the faculties was 31.09±5.50 years.
- **Gender-wise Responses of faculty member:** In this study total number 365 respondents faculty members there are two type of respondent i.e. Male and Female table 5. Shows the distribution according to the both gender who responded. There were 247 Males respondents and 118 Female respondents. The ratio is 68:32 where male respondents are more than female respondents.
- **Responses with their qualifications:** the technical qualifications as well as non-technical qualifications. There are 262 faculties who were B. E/ B. Tech. Qualification, 30 are M. E./M. Tech. There is M. E/M. Tech. with Ph. D. qualified 22 faculty members. 27 faculty members are M.Sc. these include on subject Applied Physics, Applied Chemistry & Applied Mathematics. There is 15 faculties M.Sc. with M. Phil/Ph. D. qualified. Also 03 faculty members are M. A. and 06 are M.A. with M. Phil/Ph. D. in Humanities and Social Science subject.
- **Responses on status held:** 7.4% of them were contributory staff, 57.8% of them were full time staff, and 34.8% of them were on ad-hoc basic respectively. Distribution of frequency is found to be statistically significant.
- **Effectiveness of IT based in Teaching:** 93.42% of the faculties opined positively that IT based teaching is very effective whereas 6.38% were opined negatively.
- **Importance of Computer Literacy in the usage of E-Resources:** 79.7% were agreed, 13.2% were neutral and 7.1% of the faculties were disagreed about importance of computer literacy. **Need of latest Information on their Subject:** 95.9% of them opined positively regarding "Need of latest information" whereas 4.1% of them need not opined positively.
- **Purpose of need of such Information:** 74% opined that information is used to deliver the lectures, 44.40% opined that information is used to cover topics given in the syllabus, 58.60% opined that information is used for presenting paper in conference, symposium, workshop and conferences, 47.70% opined that information is used to prepare a topic for speech, databases etc and 71.50% of them opined regarding to keep updated on the topic.
- **Fulfillment of their Informative Requirements:** 54.50% of the faculties opined that their requirements will be fulfilled with discussion with colleague, 39.70% opined that requirement will be fulfilled by requesting the librarian for new arrivals, 82.70% opined regarding help from the internet, 50.70% opined regarding referring

the journals of the respective subjects and 68.50% of them opined that their requirements will be fulfilled by searching e-sources.

- **Their access to Libraries E-Resources:** 50.1% of them access the information from libraries, 28.8% from office, 18.6% from home and 2.5% from other sources.
- **Usefulness of electronic resources for research and study purpose:** i. Online Database, ii. Electronic Journal, iii. Electronic Books, iv. on-line Catalogue, v. On-line reference work, vi. Internet Websites, vii. Fill online ILL from, viii. Electronic mails listserv, Discussion group. Maximum 39.5% of the faculties said online database was important source for research and study purposes(κ2-value=208.02,p-value= 0.00005), 38.6% said electronic journals are important (κ2-value=235.09, p-value=0.00009), 39.2% said electronic books are important (κ2-value=175.67,p-value=0.00006), 37.3% said on-line catalogue is important (κ2-value=208.98,p-value=0.00009), 35.9% said on-line reference work is important(κ2-value=199.26,p-value=0.00006), 45.8% said internet websites and very important (κ2-value=286,p-value=0.00004), 32.6% said that full online ILL form are important (κ2-value=106.74,p-value= 0.00008)and 37.5% of the faculties replied that electronic mails listserv.
- **Features of E-Resources considered being the most important for efficiency of work:** 41.90% of them opined that it is used for quick irretrievability, 49% opined regarding up-to datedness quick publishing, 59.50% opined that it is available free of cost, 68.20% opined that it is used for full-text searching, 38.90% opined that it links to other resources and 49% of them opined that electronic resources is environmental friendliness.
- **Traditional resources considered being the most important for efficiency of work:** 41.50% of them opined regarding "Seriousness-publishers/journals prestige", 57.50% of them opined regarding "Reliability of published information", 47.10% of them opined regarding "Stability/durability of the document" and 34.20% of them opined regarding "Simple mode of use". **Features of access of relevant Information resources on Internet by faculty member:** 32.9% of them had resources of on-line library catalogue, 24.1% of them had through portals and 43% of them had via web search engines.
- **Electronic publishing and traditional publishing in equal value:** 52.6% of the faculties opined that electronic publishing and traditional publishing is of equal value, 30.7% of them opined that electronic publishing a traditional publishing are not equal and 16.7% opined that they don't know the answer of this question.
- **Satisfaction with Electronic Resources with which library provides:** 4.9% of them were very dissatisfied, 9.6% of them dissatisfied, 63.8% of them were somewhat satisfied, 17.3% of them were satisfied and 4.4% of them were very satisfied with the electronic resources of the libraries.
- **Satisfaction with Electronic Resources:** i. Full text database, ii. Electronic journal, iii. Electronic books, iv. Web sites, v. Online Catalogue, vi. Online Database, vii. Ask a Librarian, viii. Discussion group. Maximum 45.5% were satisfied about full test

database (κ2-value=232.7,p-value=0.00001), 57.5% were satisfied about electronic journals κ2-value=371.69,p-value=0.00003), 51.4% were also satisfied about electronic books (κ2-value=263.23,p-value=0.00002), 47.9% were satisfied about web site facilities (κ2-value=286.93,p-value=0.00001), 40% each were somewhat satisfied and satisfied about online catalogue (κ2-value=258.52,p-value=0.00001), 49.3% were satisfied about online databases (κ2-value=289.09,p-value=0.00001), 49% were satisfied about help rendered by the librarians (κ2-value=251.39,p-value=0.00001) and 45.8% of them were also satisfied about discussion group (κ2-value= 271.697,p-value=0.00001) of the libraries.

- **Evaluation of search result of Electronic Resources Used:** 5.8% of the faculties opined "Irrelevant", 50.1% opined "Somewhat Relevant" and 44.1% of them opined "Relevant "regarding evaluation of search results of electronic resources used.
- **Rating of quality information:** 0.8% of them rated "Very Poor Quality", 4.1% rated "Poor Quality", 45.5% rated "Somewhat high quality", 40% rated "High Quality" and 9.6% of them rated "Very High Quality".
- **Rating of typical access time:** 1.6% of the faculties rated "Very Slow", 15.1% rated "Slow", 49.6% rated "Somewhat Fast", 25.5% rated "Fast" and 8.2% of them rated "Very Fast".
- **Providing of adequate training on use of Electronic Resources:** 4.1% of them rated "Strongly Disagree", 28.8% of them rated "Disagree", 19.7% of them rated "Neutral", 13.7% rated "Strongly Agree" and 33.7% of them rated for "Agree".
- **Rating of usability of library Website:** 0.8% of them rated "Very Difficult", 7.4% rated "Difficult", 35.6% of them rated "Somewhat Easy", 49.6% rated "Easy" and 6.6% rated "Very Easy". Distribution of frequency among faculties regarding use of library web site is found to be statistically significant (κ2-value=333.28,p-value=0.00023,df=4, S,p<0.05).
- **Response Rate of Librarians:** There are 49 questionnaires distributed to librarian of all engineering college under the study which are mentioned chapter 3. Out of which researcher received 43questionnaires completely and partially fulfilled from the 43(88%) colleges. The communication with librarian was personally, by e-mail, by postage correspondence and telephonic talks. A short interview with librarian was also followed for finding their opinions which are coded for collecting qualitative data under each question.
- **Library Reading Room Capacity:** 4.7% of the libraries had reading capacity of 20-30, 11.6 % had 31-40, 14% had between 41-50 and 69.8% had 51 and more.
- **Services and facilities available:** Open access to internet was available in 95.35% of the libraries, catalogue card cabinet were available in 30.23% of the libraries, OPAC facilities were available in 72.09% of the libraries, CAS/SDI was available in 51.16% of the libraries, references services were available in 88.37% of the libraries, newspaper clippings were available in 95.35% of the libraries, display of new arrivals were available in 90.70% of the libraries, internet facilities were

available in 93.02% of the libraries, reprography were available in 74.42% of the libraries, internet library loan facility were available in 55.81% of the libraries, NPTEL were available in 4.65% of the libraries respectively.

- **Library Computerization:** 81.4% of the libraries up to data computerization was done and 18.6% were still under process of computerization.
- **Availability of internet access facility:** 81.4% of the libraries internet facilities were available and in all (81.4%) of the libraries internet access facility were available free of cost.
- 69.8% of the libraries purchased e-packages for their libraries whereas 30.2% of them need not purchased any e-packages for their libraries. This frequency distribution is found to be statistically significant (κ2-value=6.72, p-value=0.009, df=1, S,p<0.05). Regarding type of e-packages, 32.56% of them purchases ASIM, 2.33% each purchases DELNET and e-journals, 23.25% purchases IEEE and 9.30% purchases J-Gate for their libraries. ASIM e-packages are most preferred for the libraries.

6. Major Findings of the Study

Major Findings of the study are given below: 74.48% respondents out of 100% questionnaires distributed among faculty members and 88% librarian out 100%, two types of questionnaires made by researcher. All the colleges were approved by AICTE and RTMNU Nagpur. Among which there were 68% male & 32% female faculty members. There were 7.4% Professors, Associate Professors & 73.7% Associate Professors which were in between age 24 to 51years with 1-15 years experience and having qualification from B.E., M. Tech, M.Sc., M. Phil., Ph. D. level. 57.8% faculty members are fulltime in service 34.8% Ad-hoc and 7.4% are contributory.

93.42% faculties say that IT based teaching is effective 79.7% faculties are understand that computer literacy is very important to usage of electronic resources where 13.4% is Neutral in this question. It was also noticed that out of 365 faculties there are 74% need the latest information to deliver the lectures. 58.60% for presenting paper in conference, symposium & workshop. 71.50% faculties information to keep updated on the topic & 47.70% faculty members need information to prepared a topic for speech debates etc. Majority 82.70% faculty members fulfilled these information requirements to take the help from the internet & 54.50% faculties discussed with their colleagues. 68.50% search e-sources. 50.70% consult the journal of the respective subjects. 50.1% faculties access e-resources from their college library, 18.6% from their home. 31% faculties spend their time to visit the library website, 35.3% of them spend the time for searching on-line catalog, and 30.4% faculties spend time for searching on-line reference book. 26% spend time for browsing e-journals. 24% faculties spend their time for accessing full text articles.

45.8% said Internet websites are very important, 39.5% of the faculties said on-line database was important sources for research and study purpose, also 39.2% said electronic books are important resource. 38.6% faculties said electronic journal are important for

their research and teaching. 35.9% said on-line reference work is important.37.5% of the faculties replied that electronic mail, listserv, discussion group are important sources for research, study and teaching purpose. 68.20% opined that e-resources is used for full text searching, 59.50% faculties opined that e-resources available free of cost, 49% of them opined that electronic resources is environmental friendliness & regarding up-to date quick publishing, 41.90% faculties said that it is used for quick irretrievability & 38.90% faculties opined that e-resources links to other resources.

57.50% faculties opined regarding reliability of published information, 47.10% of them opined regarding stability/durability of the document, 41.50% faculties opined regarding seriousness-publishers/journal prestige. & 34.20% of them opined regarding simple mode of use. 43% of faculty members access of relevant information resources via web search engines & 32.9% of faculties access via online library catalogue. 52.6% faculties said yes. The satisfactory value with electronic resources with which library provides, 63.3% faculties opined somewhat satisfied, 17.3% faculties opined satisfied. 47.5% faculties were satisfied about full text database, 57.5% faculties were satisfied about electronic journals. 51.4% were also satisfied about electronic books, 47.9% are satisfied about web site facility. 40% faculties were somewhat satisfied about online catalogue & 49% faculties satisfied about help rendered by the librarians, 45.8% of them were also satisfied about discussion group.

50.1% faculties opined somewhat relevant & 44.11% faculties' relevant regarding evaluation of search result of electronic resources used. 45.5% faculties said that quality of information acquire from electronic resources was somewhat high quality, where 40% faculties said quality of information high quality. 49.6% faculties rated that typical access time of e-resources somewhat fast & 25.5% faculties rated fast also 15.1% faculties rated slow typical access time of e-resources. 51.5% faculties said that somewhat fast, 23% faculties said it very fast 11.5% faculties said slow. 42.2% faculties rated Neutral, where 103(28.2%) faculties are agree of this & 55(15.1%) faculties strongly agree. 33.7% faculties agree to provide of adequate training on use of electronic resources where as 28.8% faculties disagree & 13.7% faculties rated strongly agree to provide training about use of electronic resources. 49.6% faculties said that library website e of their college is easy and 35.6% faculties said that the website was somewhat easy. Whereas 7.4% said college library website was difficult.

7. Suggestions:

Base on the findings of the study the following suggestions are made to improve the use of electronic resources among the faculty members.

- The electronic resources which are being used by the libraries should be periodically evaluated on the basis of their usability (user, opinion be collected) and decision be taken either to continue or cancel the subscription to these resources.

- The library must conduct training programmers for faculty members regarding how the use the electronic resources effectively.
- Awareness of the use e-journals and e-books to obtain current information should be created;
- For improved accessibility of the e-resources, the libraries under survey should create appropriate plat forms. The CD net system may be developed for the local area network similarly; the libraries should have their website with pointer to the electronics resources to provide remote access to these library materials.
- More computers should be installed in the library for the benefit of the faculty members and more funds should be giving to acquire electronic resources.
- Proper information and communication technology infrastructure should be developed.
- The libraries should subscribe to consortia based resources as available with informatics India Pvt. Ltd. Or Govt. of India or they can from the own e-resources consortia for enhanced access to e-journal in their field of research.

8. Conclusions

The engineering college libraries in India are facing challenges due to budget cut, reduced staff, devaluation of rupee, and escalation in cost of publication. Due to the factor mentioned above, engineering libraries are findings it difficult to buy required number of book and periodicals from AICTE norms. From the analysis and discussion it is evident that the fast growth of information and communication technology and particularly internet and electronic resources have change the traditional methods of research, storage, retrieval and communication of scholarly information. Now a day's internet has emerged as most powerful medium for storage and retrieval of information. In order to retrieve relevant information, users have to make use of different electronic and web resources. The study showed that the use of the electronic resources have created great impact upon of engineering college faculty in RTM Nagpur, University area in their research and development work.

The rapid developments in information technology have facilitated the convergence of new electronic devices and formats. Information has been embedded in a variety of ways and forms in various kinds of electronic resources. So far it is clear from the study that faculty member of engineering college has accepted the electronic resources but the volume of frequent usage of e-resources among the users has been found to be optimum level. Many of the respondents are unaware and have not used on-line thesis / dissertations, abstract, indexes, OPAC, online databases, which are very relevant for their teaching, study and research. So the library can take initiatives to organize orientation programmes and user awareness programme in this area. It is also obvious that libraries and information centers are gradually shifting from print to electronic resources particularly in tertiary institutions around the globe. If the electronic information resources are available in the tertiary institutions it will tremendously improved work quality and facilitate research more than using print media.

The library environment has currently undergone drastic change in terms of collections and services. The proliferation of e-resources especially it has a significant impact on the way the academic community user, stores, and preserves the information. The advantages of e-resources have drawn of the library users to a great extent.

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Author's Profile



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Use of Information Resources by the JRF Scholars in Calicut University

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Abstract: The study aimed at finding the information resources usage of Junior Research Fellowship (JRF) Scholars in Calicut University. Questionnaire survey was used to collect the information. Investigating information resource usages of a specific category of users contribute to the improvement of enhanced library services. Thus this explanatory study will help to understand the research habits and information literacy of JRF Scholars. This study tries to find out the information resource usage by JRF Scholars in Calicut University and to identify the reason for selecting the information resources. Study also investigates the problems in searching information resources in Calicut University and user satisfaction regarding various library services in the Calicut University.

Keywords: Information Resources, Calicut University, Research habits, User satisfaction

1. Introduction

Awareness about information resources available in library and the effective use of these resources has a major role in the research process in Universities. Now a day's university libraries are using new technologies to give better services to its users. A significant transformation has been taken place in the collection development policies and practices. Print medium is increasingly giving way to the electronic form of materials (Sharma, 2009). The quality of learning and research in any University depends upon the information resources available in the institution. According to Meadow and Yaun information is a message that changes the recipients' knowledge base. That is information add significantly to the existing knowledge f the user. A library system should be capable of giving information services to the users in a form that they wish to have (Meadow, 1997).

JRF Scholars in Calicut University are those who avail fellowship from the UGC directly. They are required to submit theses usually within five years. For their research works they are in need of various kinds of information resources. University libraries play an important role in providing information resources to the research community. Information sources are anything that might inform a person about something or provide knowledge about it (www.wikipwedia.org). There exist many information sources that are used by research community for their research activities that includes search engines, Wikipedia, various websites, Lectures, Library collections, Librarians, E-resources etc. the slow pace of development in the developing world had been linked to a dearth of information in the past but more recently, there seems to have been little improvement even with the greater availability of information resources. (Lucas, 2003).

2. Objectives

- To find out the information resources usage of JRF Scholar of Calicut University.

- To identify the gender wise usage of information resources by JRF Scholars of Calicut University.
- To understand the purpose of using information resources by JRF Scholars in the Calicut University.
- To identify the reason for selecting information resources by JRF Scholars.
- To understand the satisfaction level of JRF Scholars in accessing the existing information resources.
- To investigate the problems in searching the information resources by JRF Scholars in Calicut University

3. Methodology

The data was collected from the JRF Scholars in the Calicut University. The University has 30 teaching departments and a total of 187 full time UGC-JRF Scholars. Data was collected from half of the population. For the sake of convenience sample was rounded to 100. This includes 22 scholars from science department 48 scholars from language department and 30 from humanities department. A structured questionnaire was used to collect data. For tabulating and analyzing data, percentage method is used, on the basis of formulated objectives, interpretation is made through analysis. The subjects belong to science discipline is tabulated under science category and subjects belong to language discipline is tabulated under language category likewise subjects belong to humanities discipline is tabulated under humanities category.

4. Need and significance of the study

Information sources are inevitable in the learning and research processes; it helps the user community to update the knowledge. In this situation it is important to identify the information resources usage by the research community and to understand the criteria they follow to select the information resources. Understanding the use of information resources and knowing the problems in searching information resources will be definitely useful for libraries to provide better services to it's users. This study gives an opportunity to understand the usage of information resources, the reasons for selecting those information sources and satisfaction of JRF Scholars regarding the existing information sources and services in the Calicut University. The study is limited to Calicut University Library.

5. Data Analysis and the Result

The analysis of the data done is discussed below under following headings:

5.1 Frequency of accessing Information Resources

The data provided by the JRF scholars regarding the frequency of accessing information resources are presented in the Table1

Table 1: Frequency of accessing Information Resources Category

	Science		Language		Humanities		Total	
Frequency	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Daily	18	81.81	45	93.75	28	93.33	91	91
2-5 times a week	2	9.09	3	6.25	2	6.66	7	7
Once a week	2	9.09	-	-	-	-	2	2
Fortnightly	-	-	-	-	-	-	-	-
Monthly	-	-	-	-	-	-	-	-
Occasionally	-	-	-	-	-	-	-	-

Table 1 discusses the frequency of accessing information resources. The majority of the (91 per cent) JRF scholars access information daily. Only a few scholars reported that they access information resources 2-5 times a week. A few JRF scholars in science discipline (9.09 per cent) reported that they access information resources 2-5 times a week or once a week. A few language and humanities scholars (6.25 per cent and 6.66 per cent) reported that they access information resources only 2-5 times a week. It is found that majority of the JRF scholars in all the three categories access information resources daily.

5.2 Frequency of using Library resources and services

The data provided by the JRF scholars regarding the frequency of using different library resources and services are presented in the Table 2

From Table 2 it can be seen that a considerable number (35.29 per cent) of JRF scholars make use of books frequently. E-books are rarely used by majority of the (78.82 per cent) JRF scholars. A good number of the research scholars (40 per cent) use E-Journals daily. More than half of the (58.82 per cent) research scholars rarely use OPAC service provided by the library. Reference service is frequently used by a good number of (34.11 per cent) research scholars. Majority of the research scholars (78.82 per cent) rarely use book reservation service in the library. Majority of the research scholars (72.94 per cent) frequently use photo copying service in the library. A good number of JRF scholars are frequently using books, reference services and photo copying service of the library.

Table 2 Frequency of using Library resources and services

Library Resources and Services	Frequency of accessing Information Resources							
	Weekly		Frequently		Rarely		Frequency Daily	
	No.	%	No.	%	No.	%	No.	%
Books	22	25.88	15	17.64	30	35.29	18	21.17
Journals	18	21.17	29	34.11	27	31.76	11	12.94
E-books	_	_	5	5.88	13	15.29	67	78.82
E-Journals	34	40	12	14.11	25	29.41	14	16.47
Databases	16	18.82	22	25.88	25	29.41	22	25.88
OPAC	10	11.76	17	20	8	9.41	50	58.82
Reference service	15	17.64	26	30.58	29	34.11	15	17.64
Book reservation service	_	_	_	-	18	21.17	67	78.82
Photo copying facility	_	_	6	7.05	62	72.94	17	20

5.3 Purpose of using Information Resources

The data provided by the JRF scholars regarding purpose of using information resources are collected and analyzed. The information resources are found used for different purposes by the users studied. On the analysis of data it can be seen that almost all of the respondents (98 per cent) use information resources for their theses work. Comparatively a very good percentage (80 per cent) of scholar makes use of information resources for writing papers. A good number of scholars (73 per cent) depend on information resources for seminars/conferences, a considerably good number of scholars (61 per cent) use information resources to keep update their knowledge. The analysis shows majority of JRF scholars use information resources for their research works. And writing papers is also found as one of the major purposes of using information resources.

5.4 Type of Information Resources used to get information by the JRF Scholars

It is an integral part of the study to know the various information resources preferred by users for accessing information to do their research works. The responses of the JRF Scholars are summarized in Table 3. From Table 3 it can be seen that majority of the (95.45 per cent) science JRF scholars depend on lectures to get information. A very good number of science JRF Scholars (90.90 per cent) depend on library collection as well as search engines to access information for their research work. In the case of Language and Humanities research scholars it is identified that all of them (100 per cent) highly depends on lectures and library collection. More than half (59.09 per cent) of the respondents in humanities discipline make use of Wikipedia to access information. A good number of researchers in science and humanities discipline (54.54 per cent and 40 per

cent) own personal collection of information resources. A few researchers in science, language and humanities discipline (22.72 per cent, 6.25 per cent and 10 per cent respectively) ask librarians to get information. All research scholars (100 per cent) from southern Kerala prefer lectures.

Majority of research scholars (98.33 per cent) coming from northern Kerala prefer library collection to access information. It can be seen from the table a good number of the research scholars(62.5 per cent, 47.5 per cent and 37.5 per cent respectively) coming from southern Kerala prefer search engines, Wikipedia and websites like ICT (Information and Communication Technology) oriented information resources to access information. Lectures and library collection are the most preferred information resources by research scholars coming directly after Post Graduation (PG) and those have other work experience after PG.

Table 3 Type of Information Resources used to get information by the JRF Scholars

Type of Information Resources				JRF Scholars		Direct admission after PG or not	
				Category		Native Area	
	Science	Language	Humanities	South Kerala	North Kerala	Yes	No
Search engines	20 (90.90%)	26 (54.16%)	9 (30%)	25 (62.5%)	30 (50%)	27 (48.21%)	28 (51.85%)
Wikipedi	5 (22.72%)	20 (41.66%)	17 (56.66%)	19 (47.5%)	23 (38.33%)	17 (30.35%)	25 (46.29%)
Friends	8 (36.36%)	10 (20.83%)	10 (33.33%)	20 (50%)	8 (13.33%)	25 (44.64%)	3 (5.55%)
Lectures	21 (95.45%)	48 (100%)	30 (100%)	40 (100)%	59 (98.33%)	46 (82.14%)	53 (98.14%)
Websites	8 (36.36%)	20 (41.66%)	8 (26.66%)	15 (37.5%)	21 (35%)	26 (46.42%)	10 (18.51%)
Personal collectio	12 (54.54%)	8 (16.66%)	12 (40%)	15 (37.5%)	17 (28.33%)	10 (17.85%)	22 (40.74%)
Library collectio	20 (90.90%)	48 (100%)	30 100	39 (97.5%)	59 (98.33%)	50 (89.28%)	48 (88.88%)
Librariar	5 (22.72%)	3 (6.25%)	3 (10%)	4 (10)%	7 (11.66%)	3 (5.35%)	8 (14.81%)

It was found that majority of the JRF scholars in all the three categories depends on lectures and library collection to get information for their study, only a few depends on librarians to get information.

5.5 Gender wise usage of Information Resources

Information resources are of many kinds. JRF scholars are asked to express their opinion about the use of information resources they consulted, and the gender wise distribution of use of information resources are presented in the Table 4

Table 4 Gender wise usage of Information Resources

Type of InformationCategory / Resources	Science		Language		Humanities	
	Male	Female	Male	Female	Male	Female
Search engines	8 (36.36 %)	12 (54.54%)	12 (25%)	14 (29.16%)	2 (6.66%)	7 (23.33%)
Wikipedia	3 (13.36%)	2 (9.09%)	14 (29.16%)	14 (29.16%)	5 (16.66%)	12 (40%)
Friends	5 (22.72%)	3 (13.63%)	7 (14.58%)	3 (6.25%)	2 (6.66%)	3 (10%)
Lectures	9 (40.90%)	13 (59.09%)	18 (37.5%)	30 (62.5%)	5 (16.66%)	25 (83.33%)
Websites	4 (18.18%)	4 (18.18%)	8 (16.66%)	12 (25%)	2 (4%)	6 (20%)
Personal collection	5 (22.72%)	7 (31.81%)	2 (4.16%)	6 (12.5%)	1 (3.33%)	11 (36.66%)
Library collection	8 (36.36%)	12 (54.54%)	18 (36.36%)	30 (62.5%)	5 (16.66%)	25 (83.33%)
Librarians	1 (4.54%)	4 (31.81%)	1 (2.08%)	2 (4.16%)	-	3 (10%)

On the analysis of the Table 4 it is found more than half of the (54.54 per cent) female science JRF scholars are using search engines to access information. Majority female

respondents in language and humanities discipline (62.5 per cent and 83.33 per cent) make use of lectures to access information. A considerably good number of male JRF scholars in science and language discipline (40.90 per cent and 37.5 per cent) depend on lectures to access information resources. Majority of female JRF scholars in all the three disciplines (54.54 per cent, 62.5 per cent and 83.33 per cent) depend on library collections to access information. A very few male JRF scholars (22.72 per cent, 4.16 per cent and 3.33 per cent) in all the three disciplines possess personal collection of information resources.

It was found that majority of the respondents in all the three categories depend on lectures as well as library collection to get information for their study irrespective of their gender. A very few respondents depends on librarians to get information they need.

5.6 Reasons for preferring Information Resources

Users prefer Information Resources because of various reasons. So it is worth full to know the major reasons for preferring information resources. JRF scholars were asked to point out their opinion about the reasons for preferring information resources. The data provided by the scholars are presented graphically in the

Which shows that all of the users (100 per cent) in science, language and humanities discipline chose their information resources because of their ease of access. A very good number of researchers in science and language department (81.81 per cent and 93.75 per cent respectively) agree their preference of choosing information resources due to their availability in the library. A considerable number of research scholars in science and language department (68.18 per cent, 62.5 per cent) prefer information resources due to the currency of information it contains.

It is revealed that majority of the respondents agree their preference of use of information resources due to their ease of access. Availability in the library is also found to be the major reason for preferring information resources.

5.7 Knowledge about familiar services provided by the library

Calicut University Library is providing different services to its users. JRF scholars were asked to express their opinion about the familiar services provided by the library. The data provided by the scholars are presented in the Table 5.5

Table 5 Knowledge about familiar services provided by the library

	Category						Library services	
	Book reservation		Photo copying		User orientation		Reference services	
	No.	%	No.	%	No.	%	No.	%
Science	18	81.81	20	90.90	1	4.54	22	100
Language	40	83.33	48	100	2	4.16	48	100
Humanities	28	93.33	30	100	2	6.66	30	100
Total	86	86	98	98	5	5	100	100

From Table 5 it can be seen that majority of the JRF scholars (86 per cent, 98 per cent and 100 per cent) are aware of the book reservation, photo copying and reference service provided by the library. All the research scholars (100 per cent) from language and humanities discipline know about photo copying service provided by the library. Majority of JEF scholars in science, language and humanities discipline (81.81 per cent, 83.33 per cent and 93.33 per cent) are aware of the book reservation service provided by the library.

Only a few scholars (4.54per cent, 4.16 per cent and 6.66 per cent) in science, language and humanities discipline opinioned, that they are aware about the user orientation programmes conducted by the library. It was found that majority of the respondents are aware about the book reservation, reference and photo copying services provided by the library. Only a few are aware of the user orientation programmes conducted by the library.

5.8 Satisfaction regarding library services and information resources

As the user's satisfaction is an inevitable parameter for the study. The user's response to their satisfaction is sought. The satisfaction level of user community with existing resources and services is shown in the Table 6

Table 6 satisfaction regarding library services and information resources

Description	Satisfaction Level							
	Fully satisfied		Moderately Satisfied		satisfied		Not satisfied	
	No.	%	No.	%	No.	%	No.	%
Print resources	2	2	56	56	12	12	30	30
Electronic resources	16	16	32	32	40	40	12	12
Helpful staff	4	4	77	77	9	9	10	10
Convenient library hours	66	66	13	13	18	18	3	3

Table 6 shows the satisfaction level of different library services and information resources. More than half of the JRF scholars are (56 per cent) satisfied with the print resources. A good number of respondents are (40 per cent) satisfied with the electronic resources provided by the library. Majority of respondents (77 per cent) reported that they are moderately satisfied with the helpful library staffs and majority scholars (66 per cent) are fully satisfied with the library hours.

The study reveals that majority of the JRF scholars are moderately satisfied with the existing print resources and helpful staffs, a good number of scholars reported that they

are satisfied with the provision of electronic resources in the library. Majority of the JRF scholars are fully satisfied with the convenient library hours.

5.9 Problems faced while searching the Information Resources

There are different kinds of problems faced by users while searching the information resources. It is an integral part of the study to know what major problems are faced by JRF scholars while searching the information resources. Table 7 shows the difficulties faced in obtaining information resources by the study group.

Table 7 Problems faced while searching the Information Resources

Problems faced	Category							
	Science		Language		Humanities		Total	
	No.	%	No.	%	No.	%	No.	%
Lack of time	2	9.09	-	-	2	6.66	4	4
Poor attitude of library personnel	1	4.54	-	-	1	0.33	2	2
irrelevant information resources	18	81.81	18	37.5	18	60	54	54
Information resources are hard to find on shelves	9	40.90	20	41.66	9	30	38	38
Lack of awareness about accessible information resources	8	36.36	5	10.41	8	26.66	21	21
Lack of guidance in locating information resources	15	68.18	6	12.5	15	50	36	36
Uncomfortable ambiance for studying	-	-	-	-	-	-	-	-
Unavailability of required information resources	10	45.45	15	31.25	10	33.33	35	35

Table 7 shows that more than half of the JRF scholars (54 per cent) reported irrelevancy of information resources is the basic difficulty faced while searching the information resources. And a good percentage of (68.18 per cent) science JRF scholars opinioned that lack of guidance to locate information resources are the problem they faced while searching for information resources. A considerably good number of language scholars (41.66 per cent) reported that information resources are hard to find on shelves. Half of the humanities scholars (50 per cent) were in the opinion that lack of guidance in locating information resources is the major problem in finding the needed information sources. In the opinion of JRF scholars from all four department uncomfortable atmosphere and poor

attitude of library personnel is not at all a problem in obtaining information. More than half of the respondents reported that difficulty in obtaining information is mainly due to irrelevancy of information resources followed by lack of guidance in locating information resources.

5.10 Competency of research scholars

Competency of a research scholar to locate, evaluate and use the information resources depends on their skills to search information resources. It was asked to rate their skill to locate, evaluate and use materials from library. The data are provided in the below Table 5.8

Table 8 Competency of research scholars

Category	Competency							
	Excellent		Good		Poor		Average	
	No.	%	No.	%	No.	%	No.	%
Science	--	-	8	36.36	2	9.09	12	54.54
Language	-	-	24	50	3	6.25	21	43.75
Humanities	-	-	12	40	8	26.66	10	33.33
Total	-	-	44	44	13	13	43	43

Table 8 shows the competency of JRF scholars to locate, evaluate and use information resources. Analysis shows that a considerably good number (44 per cent) of JRF scholars possess good competency in locating evaluating information resources. Only a few JRF scholars (13 per cent) reported that they are poor at locating evaluating information resources. It can be seen that more than half of the JRF scholars (54.54 per cent) in science discipline have average skill to locate, evaluate and use information resources. Half of the language scholars are (50 per cent) good at locating evaluating and using information resources. A considerably good number of JRF scholars (40 per cent) reported that they have good competency in locating evaluating and using information resources.

Majority of the JRF scholars have good competency in locating evaluating and using information resources. Only a few JRF scholars reported that they are poor in locating evaluating and using information resources

6. Suggestions for improving library services

Following are the suggestions put forward by the respondents for improving the library services in the Calicut University.

- Library should acquire more documents
- Continuous user training and literacy programs should be provided in the use of information resources.
- Fully computerized library operations

7. Summary of findings

Major findings of the study are listed below:

- It is found that majority of the JRF scholars in all the three categories access information resources daily.
- A good number of JRF scholars are frequently using books, reference services and photo copying service of the library.
- It was found that majority of the JRF scholars in all the three categories depends on lectures and library collection to get information for their study, only a few depends on librarians to get information.
- It is revealed that majority of the respondents in all the three categories depend on lectures as well as library collection to get information for their study irrespective of their gender. A very few respondents depends on librarians to get information they need.
- It is revealed that majority of the respondents agree their preference of use of information resources due to their ease of access. Availability in the library is also found to be the major reason for preferring information resources.
- It was found that majority of the respondents are aware about the book reservation, reference and photo copying services provided by the library. Only a few are aware of the user orientation programmes conducted by the library.
- The study reveals that majority of the JRF scholars are moderately satisfied with the existing print resources and helpful staffs, a good number of scholars reported that they are satisfied with the provision of electronic resources in the library. Majority of the JRF scholars are fully satisfied with the convenient library hours.
- More than half of the respondents reported that difficulty in obtaining information is mainly due to irrelevancy of information resources followed by lack of guidance in locating information resources.
- Study reveals that majority of the JRF scholars have good competency in locating evaluating and using information resources. Only a few JRF scholars reported that they are poor in locating evaluating and using information resources

8. Conclusion

The present study focuses on usage of information resources by JRF Scholars in Calicut University. The collected data were analyzed and attained certain findings. The present study indicates that majority of the respondent depends on lectures and library collection to get information for their study, only a few depends on librarians to get information. It is revealed that majority of the respondents agree their preference of use of information resources due to their ease of access. Availability in the library is also found to be the major reason for preferring information resources. The analysis shows majority of scholars use information resources for their research works. And writing papers is also found as the one of the major purposes of using information resources. It was found that majority of the respondents are aware about the book reservation, reference and photo copying services provided by the library. Only a few are aware of the user orientation programmes conducted by the library. Irrelevancy of certain information sources and lack of training to locate information resources are the major difficulties faced by the research scholars. It was suggested that acquiring more documents and fully computerized library functions will improve the library services in the Calicut University.

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Users focused Library services

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Abstract: Library services are a basic element in libraries, considering a measure of the library contribution to the development of a society and education through transferring the knowledge their role is increasingly. The use of Information Communication Technologies has caused a changed in the understanding of users from what is being hosted in the library to how and when services are rendered to fulfill their demands. This paper is an attempt to understand the various information services provided by HVPM's College of Engineering and Technology Library.

Keywords: Library Services, ICT, ICT Based Services, Best Practices.

1. Introduction

Now a day's library is centre of information and place for learning and gaining the knowledge. Library is a communal place so adds to the importance of community in our lives. It is a place where all walks of life may be presented, including children, youth and aged. Hence at present library is defined as a house of knowledge. It is a mediator between knowledge containers and knowledge seekers. In real sense it acts as a 'Knowledge Hub' for information seekers. Considering the above role of library, H.V.P.M's College of Engineering And Technology, Amravati library is extended its help to users in literature search, complete their educational research work and develop career in engineering field. The college library having good collection of text books, reference books, periodical, e-collection, e-databases and consortium on variety of subjects, these emphasize on the building up a strong collection concerning the courses offered by the institution, beside this range of services is offered by the library. The library made a significant progress; it provides access to electronic books, electronic journals and databases in sciences, engineering, technology, humanities, social sciences and management. The HVPM'S college of Engineering and Technology was established in the year 200-03 by HVPMandal Amravati and affiliated to Sant Gadge Baba Amravati University, Amravati. The Institute started with three disciplines Electronic & Telecommunication, Computer Science & Engineering, and Information Technology. Subsequently degree programs in Mechanical Engineering were added as per the demand and requirements of the student. The institute started full time post graduate course in disciplines Computer Science & Engineering and Master of Business Administration in 2010 and later added four P.G. Courses in Electronic & Telecommunication, and compute and Information Technology from 2014.

2. Building

The use of library depends on the facilities offered to its user. The college library offers facilities in respect of accessing desired information to users through library building. Hence library building is the basic pillar in the development of libraries. Considering this, College makes the library building as per the AICTE norms and standard and should have

an attractive, spacious, well-equipped and functional building for its library. The library building will reflect current trends in ICT and the changing needs of library staff, students and faculty in their use of the library resources and services. **Ground Floor :** Stack room, Circulation Section (Open access for PG students and faculty), Book Acquisition section, Technical Processing Section and Reference and periodical section with one independent reading room having 105 students seating capacity is available in ground floor. Library Stores room is also located on the Ground Floor. **First Floor:** Independent reading room having 86 students seating capacity and digital library section is on the first floor.

3. Collection Development

Collection building is one of the important functions of the library that supports academic and research work of the students, faculty, staff and other users. The Library has kept a rich collection, as per university syllabus as well as various references and other reading books on Engineering Technology and Sciences including Computer Science, Electrical, Electronics Engineering, Biomedical Engineering, Chemistry, Mathematics and Physics. Library also has a good collection in the areas of Management, Social Sciences. Besides having a good collection of text books, reference books, periodical, e-collection, e-databases and consortium on variety of subjects, these emphasize on the building up a strong collection concerning the courses offered by the institution. It is the product of our cultural improvement, an essential link of the total communication pattern of modern society. trough IEEE, WILEY BLACKWELL, McGraw HILL, J- GATE (JET,JSMS), ELSEVIER,AST,PROQUEST Consortiums.

4. Book Bank Facility

- **Book Bank Scheme for the SC/ST Category Students:** Library has been run free Book Bank scheme for SC/ST category students with the grant received from Social Welfare Department, Govt. of Maharashtra. In this scheme library ass provide 6 to 7 books (as per syllabus and availability) to the students for the complete one years (Odd and even semester) in the beginning of each academic session and taken back after the end semester examination is over, apart from the normal facility of lending 2 books from Library. In this scheme, a set of books for all the subjects are given to students for one academic year up to the end of examination.
- **College book bank scheme:** Library is having a College Book Bank Facility to all the students (Except SC and ST category students which are admitted through CAP round) of HVPM'S College of Engineering and Tech. It is very much helpful for fulfilling student's requirement for the prescribed books on semester basis. Though this facility student can get 6-7 books (each book for one subject) in the beginning of each academic session and can keep the book till end of the particular semester. At the end of the semester the book has to be returned by a notified date and getting the current semester books. In case of loss or any damage of the book, the student will have to replace a new book or pay the cost of the book.

5. **Traditional Library Services**

- **Library Hours:** The Library Reading Room is open from 8.00am to 8.00 pm.
- **Reference Service:** Our Library provide all important reference sources like Encyclopedias, Dictionaries, handbooks and Manuals, Statistics, Yearbooks to the users. All the reference sources are kept in the Ground floor Reference section. Library also has provided online reference sources which may be accessed from the digital library section in the first floor.
- **Library Orientation Programme:-** Library will conduct Orientation programmes for new comer students to all in the beginning of the academic year. Besides this, library also conducted awareness programmes for users from time to time such as How to use library, How to search information in reference books or Preparation of dissertation etc.
- **Inter Library Loan:** Library maintains an inter library loan service with local libraries like SGB A University, MCA Department of HVPM , all possible efforts must be made to make available the learning resources needed for the faculty and students.

6. **Information Communication Technology Based Services**

- **Library Automation:** Library automation is the first step towards the use of Information Communication Technology (ICT) in library. It has progressing well in automating the house keeping activities of library, such as automated circulation, acquisition, cataloguing, serial control and OPAC. Library automation is not only improved the library services but also improving the library management system and administration. It is reality activity of money saving and time saving of user and library employees also. Considering these usefulness and advantages of library automation, HVPM'S college of Engineering and Technology, Amravati, library involved in the library automation process. At the beginning library was to automated made in 2003-04 (Establishment of college is 2002-2003) with network version of SOUL-0.1 library software, 03 computers and 03 persons i.e. one librarian, one library assistance and one peon. Library software installation was successfully completed but the problem was mainly in data entry of collections with limited staffs. Enquiries were made with other automated libraries which had completed automation work and it was learning that some libraries had engaged extra manpower and some libraries had entrusted the data entry work to other professional organizations on contract basis. But in case of our library it was born before one year with minimum 03 persons and 5000 plus books with 1300 plus title. After understanding all aspects the librarian had decided to start the library automation process with cataloging section, circulation section and OPAC facility.
- **Computerized Circulation System:** The library provides computerized circulation service to its user by using SOUL library software with barcode facility. In this system library create a database of all books and maintain one borrower card to each member with one unique identification number. When a user comes to the

circulation counter, the circulation counter staffs scan the membership number through barcode scanner and activate user borrowing status, input the accession number of books and issue the books to the user.

- **OPAC facility:** The library's catalogue of books and other reading material can be accessed through library OPAC.
- **Internet facility:** Internet is a biggest channel of Information resources it is up to the user how he is going to use this resource. Many services are provided on the internet such as online banking, job seeking, purchasing tickets and searching information from any place. Often these services are not available off-line and can cost you more. For more information accessing purpose our college library has create internet service with 10 mbps. It is divided in two sections one is in digital library section, another is computer center section. Through these both sections users can browse the e-journals and internet facility. Internet will help as additional tool for library for providing following types of information services to the users. In one of our earlier survey, we found that 72% users are visited the library and computer center
- **E-resources:** Electronic resources mean information resource that can be accessed through internet with the help of computer, laptop etc. These resources include CD-ROMs, Online- Databases, E-journals- IEEE, WILEY BLACKWELL, J- GATE (JET,JSMS), ELSEVIER,AST,PROQUEST Consortiums. E-books - McGraw HILL, Internet resources Information gateways and also, E-reports, E-magazines, grey literature etc. Multiple accesses speed, timesaving, accesses anywhere and anytime, riche content is some of the characters and features of e-resources.
- **E Mail or SMS Services:** At present era advanced communication technologies have finished all the heralds and promoted fast communication by across boundaries. With help of this technology library have started promoting exploring of its services.
- Our library provides e-mail service and SMS facility through Mobile phone to its user with free of cost. For that library collect mobile numbers and email-ID from the user at the time of issuing the B.T. card. Further mobile number and E-mail can be used for sending text massage or e-mail alerts about overdue of books, BT problems or any other important notice.
- **CAS (Current Awareness Service):** Current awareness services alert students, teachers, and researchers to recently published literature in their fields of specialization. Librarians who provide these services use various methods to keep current with academic and professional literature.

In this regards, we collected the names, e-mail addresses and their interested or specialization of subjects for all science and engineering faculty members from all departments.

7. P-U-T (Purchase– Use- Transfer) Scheme:

Our library is introducing the new scheme regarding library books i.e. P-U-T Scheme (Purchase – Use - Transfer). In this Scheme students may purchase book or many books (Text / Reference) listed in the university syllabus and deposit the book or set of books purchased along with the bill in the name of Principal HVPM,s COET Amravati to the college library. The college library will process the books and keep original bill receipt with the library and the books will be returned to students within two days by library. The students will keep the book or books till the completion of semester theory examination and immediately after completion of theory examination deposit the book or books in college library in good condition only and 80% of bill amount of such accepted book or books will be refunded to the student by the college from accounts department. Every member of the scheme shall be responsible for books safe custody and shall return book to the library in good condition. Damaged, marking or misplaced pages books etc. will not be accepted by the library.

8. Conclusion

In the present day library is having impact of Information communication technology. HVPM college of Engineering and Technology library is using ICT in every section of library and provide traditional as well as ICT based library services to its users. From the study it is also conclude that development in Information communication technology is increased library development. Therefore it is essential for college library to initiate organizing training programme to users and library staff also.

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Emerging Challenges and Opportunities for LIS Associations - *Improve the Image of the LIS Profession in Changing Environment*

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Abstract: The professional associations are contributing to education, training and development of the occupational groups and further associations are compelled to revamp and reorient their activities for their members. This paper readdresses the some of the prominent challenges posed by library professional associations in the contemporary library environment. It also discusses some of the advantages of associations for LIS professionals. The challenges include the role of professional associations on Membership, Research and Publishing, Education and Professional Development, Governance and Partnerships. This paper suggests at how the library associations could prepare strategies to deal with challenges facing by associations in changing information scenario.

Keywords: Professional associations, Challenges of professional associations, Library Associations

1. Introduction

Library Associations play an important role in promotion of librarianship as profession vital to an informed and knowledgeable society. The contemporary library and information profession is changing and facing increasing pressures to achieve higher and higher level of performance in a quick paced and competitive worldwide environment. Today benefits gave by libraries depend on the most up to date, forefront innovation and professional associations have a noteworthy part to play in LIS development. Recent developments such as internet technologies, online access to information, remote logins, library networks, digital libraries, electronic resources, consortia, content management systems and e-learning, social media, mobile technologies, digital governance, cloud computing, and other media technologies, to ever diverse patron groups with increasingly complex information needs make mandate to improve the professional skills and competencies in LIS professionals by professional associations.

The basic mission of any library association is to create and develop products and services which offer practical solutions to the problems of this fast changing world, to prepare leadership for the development, promotion and improvement of library services, to promote excellence through continuing educational program, publications, communication and awards, and to undertake other such innovative programs. The purpose is to develop, expand and enhance the professional knowledge and status of the profession. Library associations in India have been playing an important role in conveying useful messages and guidelines for library development, acting in this transitional era as meeting places for professionals, helping them exchange opinions and promoting open access to information while also facing a series of structural, political, cultural and financial challenges. Regardless of size of inclusion, there has been moderately little analysis of the

challenges and strategic plans needed by Indian library associations would provide how associations should manage the entire professional community. The paper is appropriate to all types of LIS professional associations irrespective of national, state level as well as regional associations and local bodies in the arena of library and information services. As we have seen in recent years, the status of an information profession is always contingent and unfinished – new occupations may emerge to satisfy new complexities confronted by users of the library system. Information professionalism a developing nation like India need relevant information to be effective in their positions and that practical up to date information is shared at association conferences and in association publications, Listservs, online forums and websites. Unlike their counterparts in US and UK, the majority of library associations in India are unable to provide robust leadership and fulfill the expectation of the professional community.

2. LIS Professional Associations: International Perspective

Professional associations have a long history in the library world. Most national associations have existed since the first half of the 20th century or earlier, with many of the provincial associations having a similar longevity. The roles of professional associations have been variously defined: "A group of people in a learned occupation who are entrusted with maintaining control or oversight of the legitimate practice of the occupation;" also a body acting "to safeguard the public interest;" organizations which "represent the interest of the professional practitioners," and so "act to maintain their own privileged and powerful position as a controlling body."

The American Library Association (ALA), founded in 1876, stands out in terms of its influence and authority and its contribution to library education and training in the United States: "The American Library Association aims to promote the highest quality library service by providing resources, leadership, and support for both the professional education of library workers and the development of library programs and services that support continuous learning" (ALA 2005). The Chartered Institute of Library and Information Professionals (CILIP) (formerly the Library Association) in the United Kingdom has over the years taken leadership in the education and training of librarians through accreditation of the programmes of study offered by universities there (CILIP 2004; 2005), and through setting a code of professional ethics and standards. Practicing librarians in the United Kingdom and beyond have taken pride in being members of CILIP. These two associations are the driving forces of the profession in their respective countries in areas such as lobbying and the regulation of standards for education and training. The Australian Library and Information Association (ALIA) is also well-established in this field (ALIA 2005). A professional association is a vehicle for leadership. The most common functions of an association are (1) creating opportunities for and, indeed, stimulating the exchange of ideas and information, (2) defending and promoting the work of the field beyond the boundaries of the profession, and (3) seeking consensus on standards or, at least, mini- mum levels of knowledge, accomplishment, and activity appropriate to maintaining professionals. Library associations are key institutions in the library and information sector around the world. Library associations are advocates for equitable access to information, and help to build

strong, sustainable library communities by improving services for library users, and supporting development of the profession.

3. LIS Professional Associations: Some Advantages

- **Educational Opportunities:** Associations give various open doors, for example, gatherings, conferences, webinars to gain from our field's leading practitioners. Educational sessions are generally accessible to both members and non-members, but often at a considerable price difference that makes a membership often a worthwhile investment for this reason alone. The professional associations make arrangements to continuing education, learn from other people comparable positions and difficulties, and shake up your point of view with new considering. There are likewise chances to share your insight by exhibiting the consequences of your own research, examination or experience. These open doors can be invaluable for advancing your career and improving your name known in the library community.
- **Advocacy:** Library associations are imperative courses for support and advocacy. This comprises of writing letters to ministries, UGC, different influences on issues of significance to our individual members as well as talking face to face with politicians and other decision makers including government officials. The office bearers and individuals from the associations utilize these individual to-individual gatherings with people inside of the social and political groups of the locale to convey the vital part that libraries play in the training, education, and prosperity of LIS professionals . By supporting your association you help keep the important work of libraries in the minds of decision makers and committees formed for such purpose.
- **Networking Opportunities:** At conferences, through the work of your association's board and committees and at sponsored social events, we have a chance to meet other LIS professionals in our region or state or country. This is a very useful way of connecting with people outside your workplace. Relationship building can make between institutional participation less demanding, furnish you with employment references and contacts, and create chances to team up with others that you would not normally have.
- **Leadership:** Leadership skills are imperative in most, if not all, library positions: so is figuring out how to function admirably with people be they colleagues, superiors, or subordinates. Leadership development became a focus of attention for most major professional associations. Involvement in library associations gives you opportunities to experience leadership situations. This development may take place through your participation as a committee member or chair, a member of the board or the executive, or as the coordinator, organizer of a program or project. Some of the involvement that you have had with professional associations includes experience as conference co-chair, board member, resource person, panel member and personnel committee member. You have had to deal with contractors, direct staff, and work with colleagues. These experiences have made us a better manager

at work, better able to persuade others of the merits of, and better able to work with individuals with diverse skills and personalities.

4. Issues and Challenges for LIS Professional Associations

The challenges remain relevant, delivering value and being sustainable in all types of associations. Some of the prominent challenges posed by LIS professional associations in the contemporary library environment are discussed below. The associations' primary roles are best categorized in five main areas. These are Membership, Research and Publishing, Education and Professional Development, Sustainability, Governance and Partnerships.

- **Membership:** The member engagement goal looks at how we can expand an association in which all members, regardless of location or position, have the opportunity to participate in, contribute to, and benefit from engagement in their Association. This goal stresses continued innovation and experimentation in the creation of new opportunities for face-to-face and virtual engagement and new ways of recognizing member contributions.
- **Challenges:** The following are some of the challenges regarding membership in professional associations.
  - Member retention
  - Ageing workforce
  - Clearly identifying associations core activities
  - Limiting member participation
  - Less institutional members
  - Distinct expectations of the library and information community
- **Possible Solutions:** Meeting the above challenges is measured by increased membership in both new and retained member categories and more active participation of members in association activities. The following are some suggestions for meeting the challenges of membership:
  - Developing strategies that are evidence-based to increase membership by providing value for both institutional and personal members
  - Supporting LIS groups, committees and representation at the local, national and international level
  - Encouraging members' involvement in local activities and the big works of the association
  - Acknowledging and applauding the value of members as volunteers
  - Accompanying events that meet members' needs

  The associations' expectations on membership are that:
  - Membership is valued and accepted as integral to professional standing

- Associations are proactive in encouraging industry leaders and managing to join in associations
- Professional members are strong and committed advocates for the association and the profession
- Everyone working in library and information sector will be a member of some national level associations.

- **Research and Publishing:** The library associations must exercise a positive role in the creation of a body of literature in its areas of interest and for LIS professionals. The development of this body of literature is necessary to the establishment of a profession. The job here is to cause to be written, published, and made available basic literature on all aspects or particular aspects of library service and librarianship, depending upon the scope of the association's accepted responsibilities. The professional associations shall play a vital role in recognizing, enabling and promoting a research culture amongst qualified professionals. It is evident that if the library profession is to grow and thrive as a true profession, demonstrating not only typical practice, but also consider scholarly approaches to the issues of its day, then its commitment in apt and relevant research practice is indispensable. A strong research and publishing program provides the profession with a strong foundation for future growth and achievement.
- **Challenges:**
  - Lack of understanding of the significance of research by members and how it us undertaken
  - Competing priorities limiting the support and engagement in research
  - Changing publishing environment and revenue generation
  - Diverse member anticipations in the area of research and publishing
- **Some useful Suggestions:** The success of research and publishing by members in associations is measured by increased no. of events, activities and resources supporting research in the profession, the effective implementation of Publishing Action Plan and Increased contributions to professional journals. The following are some suggestions to overcome the said challenges of research and publishing:
  - Promoting the value of research within the profession
  - Developing the comprehensive Research Action Plan
  - Reviewing the research work and publications and implementing in the results for effective output

The associations' are expecting their future regarding research and publishing as:

- The library and information profession has broad recognition of the value of research as a vital professional skill and knowledge

- Professional members actively participate in research and scholarship including more authoring and publications
- Increased collaboration across the library and information sector and academia to undertake quality research
- Associations publishing activities will be financially sustainable while meeting the needs of members

4.3Education and Professional Development

Professional education and training has always been one of its main objectives and fundamental requisite for growth of any profession. A professional association plays a critical role in promoting sustainable professional growth and integrity in a discipline or profession by, amongst other things, ensuring that high standards of education and training are attained. Professional associations are formed to promote the interest of the professions they represent and gain respect and recognition for their members. They act as a mouthpiece for the profession, and deal with such matters as codes of practice and conduct, and education and professional qualifications. Building the profession goal includes ensuring that library education and training reflect the core values of the profession and meet the needs of the communities we serve. It also encompasses providing continuing education and career development and certification opportunities, as well as leadership and career development opportunities for LIS students. Here we discussed the role of library associations in preparing professionals to face such challenges from time to time. We also discuss the activities of professional associations such as the education and training of professionals. Obviously, attracting and maintaining quality professionals and providing a supportive environment to reach for new heights guarantees a strong, committed, knowledgeable profession.

- **Challenges:**
  - Convincing organizations of the value of library and information education and PD
  - Pulling people to the profession
  - Communicating the (present and future) boundaries of the profession
  - Developing common and shared understandings of preferred learning outcomes from entry level programs
  - Complexity of the dynamic university, national and international education environment
- **Suggestions:**
  - Promoting and supporting the LIS education
  - Developing successful partnerships with our practitioners and educators
  - Increasing recruitment to the profession and promoting the library and information career pathways

- Reviewing, supporting and promoting the associations professional development program
- Encouraging employers to recognize the value of library and information qualified and skilled staff

The associations are expecting the following outcomes from education and professional development:

- The LIS profession is recognized for its specialized qualifications and professional skills
- Library and information science courses offer programs of excellence to meet the needs of academic institutes, special libraries, public libraries and industry and the profession
- LIS members are bound to and actively participate in professional development (PD)
- Professional associations play an active role in succession planning for the library and information profession
- Associations conferences and events are 'must attend' activities

The outcome of education and professional development by professional associations can know by attendance and participation in associations' events, professional development activities, increasing student numbers and members.

- **Governance:** The organizational excellence goal calls for continuous improvement of products and services to better serve and retain current members and to attract new members. It also addresses the need to develop the resources needed to safeguard the vitality of association programs and services, and to strengthen the chapters and zonal centres. A strong association retains relevance and stability through forward planning, a considered framework, and a thorough knowledge of its responsibilities. The outcomes of good governance by professional associations can know by executive body, council members and office bearers' active involvement at associations' events, qualification of council member candidates and Governance checklist achieved and all compliance with all legislations, minutes and ordinances.
- **Challenges:** The following are the challenges of Governance of professional associations:
  - Attracting skilled and experienced office bearers
  - Not revenue driven environment and consistence obligations
  - Members' engagement in the association election and decision process
  - Staying significant

Ensuring following steps may overcome the challenges of professional association's Governance.

- Recruiting prospective and dynamic board contenders
- Continuing to offer Boardroom Bound
- Adhering to standards checklist for governance in terms of execution and council members or executive body operations
- Observing code of conduct for office bearers
- Making good decisions
- Assessing what is achieved and reviewing the progress

Effective governance of professional associations will lead to:

- Diverse leaders in the field become council members
- Have a defined Board of Directors' succession plan
- The high standard of governance and accountability under relevant legislation

- **Partnerships:** Fifth, the library association cannot and should not, any more than other types of associations, remain distant from the international scene; it must develop relationships with similar foreign bodies. The purpose is one of mutual advantage through the exchange of information, shared point of preference and experience. The national interest also figures heavily here, for the library association through its international relations can contribute much tobetter international understanding. The area of international relations is a sensitive one, as all efforts at all levels show, and needs to be tackled with good will, the zeal to learn as well as to aid, and a high sense of sophistication. To be effective, the profession must speak with one clear and collective voice.

- **Challenges:**
  - Acknowledgement for associations lobbying and advocacy activities
  - Diversity of the library and information sector and agreement on advocacy issues and priorities
  - Assortment, complexity and capacity of associations.

Partnership challenges can overcome by developing, maintaining and nurturing partnerships, supporting initiatives to promote the segment and the value of libraries, advocating to government and key stakeholders, working with the similar library associations in the country to develop strategies to get benefits of collaboration, partnerships or merger and developing strong links with other international associations. The success of partnership by professional associations is measured by establishing, monitoring and reviewing a lobbying and advocacy and development of mutual agreements.

5. Conclusion

Within India library associations are, for the most part, made up of individuals-thinking, feeling, concerned individuals. The association in considering its role must keep always in

mind the reasons which it is induced. Professional associations with a desire to engage members in a full range of options should now consider the challenges for the benefits of as not only being desirable, but as something they can provide through formally structured and facilitated programs. This may appear a difficult task. However, professional associations should run along with members and technology and should not lag behind in supporting any way. Library associations all over the world are playing a positive role in keeping librarians in readiness. In India, Indian Library Association is rendering opportunities. In fact, all other associations should look at the challenges facing in their associations seriously and take necessary steps for further and endless development of LIS.

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Human Resource Management for Libraries and Information Centres

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Abstract: The paper deals with the various aspects of human resource management in libraries and information centres. In this context, different growing complexities of human resource management have been dealt with. The HRM functions and some other issues of HRM in the libraries and information centres have been mentioned. The various sub-systems within the human resource information system (HRIS) and the information system to knowledge management have been discussed. The differences between traditional HR and E-HR have also been highlighted.

Keywords: Human Resource Management (HRM), Information Systems, Human Resource Information System (HRIS), Knowledge Management Information System

1. Introduction

Human resources management is the process of bringing together the workers and the organization together so that each can achieve its goal. It tries to acquire the full cooperation of the workforce. In other words, it is a process of procuring, developing and maintaining the competent workforce to achieve the organization's goal in an effective and efficient manner. The strategic importance of human resources is increasing in today's knowledge-based industries. An organization's success depends on the knowledge, skills and abilities of employees (KSAs) since they help to establish a set of core competencies that distinguishes an organization from its competitors.

2. Importance of Strategic Human Resources Management

SHRM is the pattern of planned human resources developments and activities intended to enable an organization to achieve its goals (Wright and McMahan). Thus, the human resource function is accepted as a strategic partner in both the in both the formulation of an organization's strategy and also their implementation in the organization. During the formulation of strategic plan, the human resources management can play a vital role by identifying the external threats and opportunities. Competitive intelligence like new incentive plans, data regarding customer complaints can be supplied by human resources management which may be helpful in formulating strategic plans.

3. The Growing Complexities of Human Resources Management

Management of human resources is gaining complexity in the last few decades for several reasons:

- One reason is because of the workforce becoming heterogeneous, the managers have to deal with the employees from different backgrounds.

- The expectations of, especially, the well-educated employees to have jobs that have meaning and have a role in their career advancement is another reason for the enhancement of complexity of human resources management. They do not want to remain content with the jobs where they do not have any say in the decisions that are related to them and their jobs.
- Not only the jobs but also the hierarchical patterns of the organizations are also being restructured owing to the technological advances. Now, a group of workers is often not required to report to a single supervisor. Instead they are structured into groups who manage themselves. This situation provides with a new challenge to the human resources managers.
- Many organizations are downsizing, that is, reducing their number of workers and fewer number of employees are performing the amount of work used to be performed by more number of employees in the past. Another situation that is becoming evident is that the organizations are running by depending on the temporary workers or outsourcing the work used to be performed internally. Human resources managers face many complexities in dealing with these situations.

Many libraries are not big enough to recruit a human resources manager. Sometimes the human resources functions are performed by the parent organization. But many librarians have supervisory responsibilities and human resources management responsibilities fall within these responsibilities. Some librarians in their first managerial position are required to supervise employees much senior to them. One of the most difficult aspects of the jobs of a manager is to deal with people-related problems since they keep on changing. Besides, each employee is unique, one technique of managing may work well with an employee but not with another. So, it is not true that a single technique of managing an employee can be applied uniformly to the entire workforce. Thus, it may be easy to learn the human resources principles but in practice, human resources management is a very difficult area.

4. Libraries and Information Centres of the Present Century

The libraries & information centres today are appearing as open system that takes input from outside, changes them and gives them back to the environment. They are composed of different sub-systems which are subject to the change cycle. Any change in any one of the subsystems, always affects the other sub-systems and brings about changes in them. Thus, the goals and objectives are dependent on that larger environment and the success of the organisation depends on the input which should be able to produce usable output. Psychosocial groups are formed among the individuals within the organisation and also with others outside the organisation. The organisational structure divided into subsystems decides on the way assignments are to be divided and executed. These are embodied in the documents like organisation charts, performance evaluation processes, policies relating to service and structure and procedure manuals. The technical sub-system is organised by the required knowledge, skills, techniques, the technological equipments and other machineries. These sub-systems keep on interacting among themselves and face

the challenge of creating a knowledge- rich and technologically savvy environment. The effects of these interactions are manifested in the larger managerial subsystem which comprises of all the sub-systems and has to face the greatest change.

5. The Human Resources Functions in the Libraries and Information Centres

When an employee is recruited, the first thing he/she needs is orientation and training. There is also a need for a compensation and benefits package for him/her. Sometimes disciplinary actions may have to be taken against an employee. In some other cases, an employee may want to file a grievance. All these activities come under the purview of human resources management.

The human resources functions of a library include:

- **Training and Staff Development:** Training is a continuous process. In a library, as in any other institution, there are different levels of training. Some are more specialized and others are required for all. Although, trainings are expensive to be executed, it would be a false economy to stop these programmes since the investment in the training will be returned in quality performance.
- **Performance Appraisal:** It is a systematic evaluation of an employee on the basis of his/her job-related strengths and weaknesses. There are standard methods for performance appraisal and no method works best in all institutions. An institution can combine two or more methods for the purpose of performance appraisal. The method used may be that used by the parent institution as in the case of a library that is part of a parent institution. If a library can select its own method, the staff committees have a say in selecting the method. In large libraries and information centres, the human resources office plays a vital role in selecting the appropriate method. The commonly used methods are essays, ranking, forced distribution, graphic ratings scales and the behaviourally anchored rating scale. Management by objectives (MBO) is an efficient performance appraisal system. The factors assessed should all be job-related, whatever method is used.
- **Discipline and Grievances:** Discipline is the action taken by an organization against an employee when his/her performance has deteriorated to the level where action is necessary or he/she has flouted any institutional rule. On the other hand, grievance is concerned with the dissatisfaction of an employee related to his/her job which is brought to the attention of the organization. In both the above cases, the human resources department has a role to play.
- **Employee Compensation:** The salary administration is aimed at compensating the employees for their performance. Many companies which operate for profit provide with annual bonuses or other special facilities. But the libraries and information centres being non-profit making organisations pay only the salaries

and benefits. The libraries differ between wages and salaries. The wages are calculated on the basis of total number of hours worked by an employee per week. Salaries refer to the compensation of an employee that remains uniform from one pay period to another. The salary administration of the employees is a major function of the human resources management. IT has changed the jobs of most libraries. Nowadays, they perform jobs similar to that of a computer or systems workers. But the librarians are paid less. If libraries and information centres want to employ talented employees, effort must be made to pay them higher. The disparity between the technologically efficient workers in libraries and in the corporate world must be removed if the libraries and information centres want to recruit new tech savvy workers. Herein lies the importance of the human resource managers to decide on how to tackle the situation.

6. Some Policies and Issues in HRM in Library and Information Centres

Human Resources Policies and Procedures: The policies and principles are important components of human resource functions in libraries and information centres. A policy is a statement of action that leads the management to follow a definite plan or course of action. Policies regarding recruitment and promotion, for example, are of utmost importance to an organization. They help the managers to follow a consistent and uniform decision-making. The employees should be allowed to know through the policy statements what the human resource programme is, how it operates, why salaries are administered in a particular way, when and how the performance appraisal will take place and what benefits are available. Even in larger libraries and information centres, where there is a specialized human resource department, it is the duty of the librarian to formulate a set of policies. While formulating the policies, he/she should involve the other staff-members who may recommend some modifications regarding the policies.
A set of policies serves various functions:

- Such policies lead the library management to think for the needs of both the employees and the organization.
- Such policies ensure consistency of treatment for all the employees since each supervisor follow the same set of policies. Thus the policies reduce favouritism and discrimination.
- The policies allow continuity of action. Even when a supervisor or manager retires or resigns, the new manager has a written set of policies to follow.

In addition to policies and procedures, there are rules, which may be defined as law or regulations regarding the code of conduct for the employees. Libraries should also have rules like other organizations. For example, for how many hours an employee should work or how many absences an employee can have.

Health and Safety Measures: Employers should provide with a healthy and secured environment for the workers to work in. Most of the libraries today provide healthy and secured environment. Majority of the libraries have become non-smoking zone so that the

employees are not subject to passive smoking. They have security and disaster management devices to face the challenges of emergencies. Some health hazards being faced by the employees in the libraries and information centres are as follows:

- **Physical stress:** A type of physical problem being faced by the library professionals today is the use of computers for the whole day. They are suffering from 'Repetitive Stress Injury' (RSI) due to repetitive use of keyboard of the computers. Libraries are taking steps to prevent this type of health problem in the following ways:
    - Many libraries have made arrangements for ergonomic chairs, workstations and keyboards.
    - Some libraries give more frequent breaks or intervals of jobs.
    - Some have increased varieties of tasks within a job.
    - Exercise sessions are being followed by some libraries
- **Job-Related Mental Stress:** Though the libraries are very often considered to be of stress-free environment, nowadays, the librarians are also subjected to different kinds of stresses.
    - The rapid rate of computerization in the libraries is demanding of the librarians to learn new techniques and methods. Technology has expedited the ways of tasks being done, for example, the e-mail and the fax have cut down the time needed in communication. This rapid and frequent rate of change may cause stress.
    - The decrease in budget-allocation for the libraries is compelling the librarians to assume more responsibilities resulting in stress.
    - Role ambiguity is a major cause of stress when an employee does not know clearly about his/her duties. In libraries and information centres, often there is a conflict between the librarian and the support staff regarding respective roles. This situation may result in some kind of stress.
    - Often interpersonal demand may cause stress when an employee constantly faces the unpleasant or abrasive co-workers.
    - The downsizing of the libraries has resulted in the same number of jobs being done by a less number of employees which may result in some kind of stress.
    - Stress can be caused by the conflict between job and off-job responsibilities like family or financial problems.

Common Causes of Stress	
Personal causes	Financial problems Family problems Illness
Organizational causes	Interpersonal demands Role conflict or ambiguity Technology Downsizing Constant change

Source: *Library and Information Center Management - Robert D. Stueart and Barbara B. Moran.*

The duty of the Human Resource manager is to identify the stress problem of each employee since the stress factors may vary among individuals and help him/her to cope with the situation.

7. Information Systems for Human Resources

A Human Resource Information System (HRIS) is a system of hardware and software which stores and processes data regarding human resources. It is also known as Human Resource Management System (HRMS) or Human Resource Information and Management System (HRIMS). Earlier Human Resource departments depended on various tasks in each department. Now, HRIS combines all these tasks into a common database. A sophisticated HRIS simplifies transactions, automate administrative tasks and minimize paper-work The different Sub-Systems within the HRIS are:

8. Information Systems for Recruitment and Selection

This type of information system:

- Manage the talent supply chain
- Identifies the quality candidates in a faster and better way

The advantages of using this type of information systems are:

- Quality and quantity of employees are got in this manner
- Recruitment costs become low
- The hiring process becomes faster

9. Information Systems for Training and Development

Learning is no longer considered a matter of sending employees to training courses. Technology tools are applied for a number of learning processes like instructor-led live training courses. The training and development programme can implement e-learning system to:

- Extend learning beyond the enterprise to customers, suppliers, partners as well as employees

- Automate learning to develop the workforce
- Provide learning advice to customers and suppliers
- Know the organization's learning needs and analyze learning effectiveness.

Employee Relationship Management through Information System

- The non-IT organizations have also realized the need to invest in order to enhance their human resource functions.
- Besides saving the time and money, it retains the employee within the organization.

Information Systems for Performance Management

A Performance Management System (PMS) enables managers and employees to:

- Plan performance, behaviours and competencies
- Connect the strategic objectives of the organization to the performance results and goals of the employee
- Keep track of the performance throughout the performance period
- Take assistance of the human resource advisement tools like writing assistants, language checker and development tips
- Rate and weigh results and competencies
- Identify the top performers and those who require performance improvements

Comparison of traditional HR to e-HR

Key HR Process	**Traditional HR**	
Acquiring human resources		
Recruitment and section	• Paper resumes and paper posting	• Electronic resumes and internet posting
	• Positions filled in months	• Postings filled in weeks or days
	• Limited by geographical barriers	• Unlimited access to global applicants
Section	• Costs directed at attraction	• Costs directed at selection
	• Manual review of resumes	• Electronic review of resumes (scanning)
	• Face-to-face (FTF) process	• Some distance interviewing (still FTF)
Rewarding human resources		

Performance evaluation	• Supervisor evaluation	• 360-degree evaluation
	• Face-to-face appraisal	• Appraisal software (online & hard copy)
Compensation and benefits	• Time spent on paperwork (benefits changes)	• Time spent on assessing market salaries
	• Emphasis on salary and bonuses	• Emphasis on ownership and quality of life
	• Naive employee	• Knowledge employees
	• Emphasis on internal equity	• Changes made by employees online
	• Changes made by HR	• Changes made by employees online
Developing human resources		
Training and development	• Standardized classroom training	• Flexible online training
	• Development process is HR-driven	• Development process is employee-driven
Career management	• HR lays out career paths for employees	• Employees manage their career with HR
	• Reactive decisions	• Proactive planning with technology
	• Personal networking (local area only)	• Electronic and personal networking
Employee relations	• Focus on employee-management relations	• Focus on employee-senior management relations
	• Task performance monitoring	• Focus on employee-employee relations
		• Use of technology for linking performance, training and assessment, employee development monitoring
Retraining human resources		
Retention strategies	• Not a major focal point	• The critical HR activity currently (ERM efforts)
		• Online employee opinion surveys

		• Cultivating an effective company culture
Work-family balance/job satisfaction	• Not a major focal point	• Mundane tasks done by technology, serving time for more interesting work
		• Development and monitoring of programs
		• Providing care for children and elders
		• Erosion of work-home boundaries

Table from 'Management Information Systems' by Mahadeo Jaiswal and Monika Mital

10. Information Systems for Knowledge Management

Nowadays, a greatest challenge faced by the human resource managers is how to manage the organizational knowledge and utilize it for competing with other organizations. The Human Resource Management System (HRMS) can manage knowledge but they need to be redesigned for this purpose. Knowledge workers are the human resource and marketing professionals, software engineers, project managers and business analysts whose main component of work is 'knowledge'. They utilize and produce knowledge everyday. They are expected to produce, organize and disseminate knowledge to other employees of the organization since their task is to design mechanical or logical products using information. Knowledge management is concerned with the generation, dissemination and maintenance of knowledge to fulfil the organizational targets. People generate knowledge through transactions, consume it by using it in decision-making and disseminate it by interacting with others. Therefore, when an employee leaves an organization, he or she carries both the professional and the social knowledge with him or her. Within an organization, an internal knowledge market can be formed where employees will be able to buy and sell knowledge, that is, exchange knowledge contributing to the environment of knowledge exchange.

11. Conclusion

The human resources management (HRM) has gained importance in every type of importance in every type of libraries and information centres. The larger the libraries grow, the more complex is the HRM system. The Human Resource managers should always endeavour to provide the organization with the efficient and technologically proficient employees so that the organizational goals are achieved. Besides, the Human Resource manager should also address the employee grievances and pay heed to the salary and other benefits. Nowadays, E-HRM has to some extent simplified and expedited the tasks of a Human Resource manager. On the other hand, the complexities of Human Resource

Management (HRM) are growing day by day and the Human Resource (HR) managers should face these challenged with great zeal.

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Human Resource Management in Academic Libraries: *An Overview*

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Abstract: The paper deals with the various aspects of management which emphasis on the Human resource management. The management of library staff is itself an important task. All staff should have a clear understanding of the policy of the library service, well- defined duties and responsibilities, properly regulated conditions of employment and salaries that are competitive with other similar jobs. This paper has been organized around some of the key issues in human resource management administration in the academic library. The intent in the space available is to provide a flavour of the issues and challenges and to stimulate librarians to examine their own human resource policies and practices, management style, working conditions etc. with a view to providing an improved level of human resource management. The paper also focus on HR function at academic level, and then evaluate specific structures of the academic library within the broader organization.

Keywords: HRM, Academic Libraries

1. Introduction

Human resource management (HRM) is a major subsystem of the entire organisation as well as Libraries. Today the library and their information system are the complex organisation committed to serve the users demands. Libraries have growth in times in social, cultural, scientific and technological environments in which they have been developing and operating. Modern libraries are not merely meeting house of information and knowledge to the society. The human resources of an organization consist of all individuals engaged in any of the organization's activities. Libraries employ not only large numbers of people, but also very diverse kinds of people. It is not unusual for sixty to eighty percent of a library's budget to be devoted to salaries. Thus effective human resource development is critical to a library's achieving its goals and objectives. In times of extreme financial constraint, the very survival of a library may be highly dependent upon the quality of human resource development. Human resource management (HRM) can be defined as "the recruitment, selection, development, utilization and accommodation to human resources by organizations." The human resources of an organization consist of all individuals engaged in any of the organization's activities. Human resources are the people who work in an organisation. Human resource management refers to the policies and practices involved in carrying out the 'people' or human resource aspects of a management position, including recruitment, screening, training rewarding and appraising. Human resource management is the planning, organising, directing and controlling of the procurement, development, compensation, integration, maintenance and separation of

human resources to the end that individual, organisational and social objectives are accomplished.

2. Human Resource in Academic Libraries

The academic library is a microcosm of the institution because it faces most of the issues confronted by the campus HR office. The academic library is not the only administrative unit on a campus with this mix of faculty, exempt, non-exempt, part-time, permanent, temporary, student, and non-student employees, it is one of the only places where all these employees interact in a number of ways, and in none of these other offices is the mix of employees such that patrons can mistake one for the other. A library's HR officer works with its faculty, staff, and student employees to coordinate all aspects of their particular job-related issues. Engaged in both the academic and administrative sides of the institution, these persons may likewise be involved in budgeting and planning and function on the management team that reports to the library director. The nature of a library HR officer's work varies. But all are likely to include certain basic functions. The library HR officer is responsible for developing, implementing, coordinating, and monitoring all human resource programs and processes for academic librarians, professional, and classified staff, and hourly assistants.

3. HRM Duties and Benefits

Human resource management (HRM), or human resource development, entails planning, implementing, and managing recruitment, as well as selection, training, career, and organizational development initiatives within an organization. The goal of HRM is to maximize the productivity of an organization by optimizing the effectiveness of its employees while simultaneously improving the work life of employees and treating employees as valuable resources. Consequently, HRM encompasses efforts to promote personal development, employee satisfaction, and compliance with employment-related laws. To achieve equilibrium between employer and employee goals and needs, HRM departments focus on these three general functions or activities: planning, implementation, and evaluation. The planning function refers to the development of human resource policies and regulations. Human resource managers attempt to determine future HRM activities and plan for the implementation of HRM procedures to help institutes realize their goals. Implementation of HRM plans involves four primary activities: acquisition, development, compensation, and maintenance. Acquisition entails the hiring of workers most likely to help a institute attain its goals. The development function encompasses the training of workers to perform their tasks in accordance with institute strategy. This activity also involves institute efforts to control and change employee behaviour via reviews, appraisals, incentives, and discipline. Compensation covers the payment of employees for their services. Maintenance requires structuring labour relations—the interaction between a institution's management and its unionized employees—and ensuring compliance with federal and state employment. Finally, the evaluation function includes the assessment of a institution HRM policies to determine whether they are effective.

4. Human Resources Planning

Employment planning is an essential part of managing the staffing process. It should be responsive to general environmental conditions with which the library must cope and reflect the organization's goals and objectives. It includes a skills inventory, an analysis of current and expected vacancies, an analysis of expected expansions or reductions in operating units, and a systematic plan for recruitment and promotion. It is a comprehensive, on-going process which includes, but is broader than, making projections. Most academic libraries are now subject to severe budget constraints and sometimes a freeze on filling vacancies, human resources planning is more critical than ever. It is also more difficult than ever because of rapid change in the environment, factors such as government regulations and unionization, and the need to create innovative staffing arrangements not only to provide needed services, but also to ensure that librarians continue to develop professionally in spite of being caught in a "zero growth" economic situation.

- **Staffing:** "Staffing" should be thought of as an integrated system which includes all methods of matching skills available with the tasks to be performed, through hiring, placement, promotion, transfer, job restructuring, and training. Library staffing patterns have been shifting as a result of changes such as those in technology and especially automation, financial constraints, attempts to utilize staff more effectively, and changing forms of governance. The staffing of libraries is becoming more differentiated. Enlightened library administrators are recognizing that several kinds of staff are needed and that the tasks each type of staff performs should be appropriate to the jobs for which they were hired. Library staff may be distributed into three groups:
  - professional: including librarians and other specialists with a graduate level degree
  - supportive: including library technicians with a two-or three-year college degree, and library assistants with a bachelor's degree
  - clerical: including office staff with high school education
- **Job Analysis:** A major component for effective employment planning is job analysis. Job analysis is a major undertaking requiring the specialized knowledge of the personnel administrator and a considerable input of other staff time. An alternative means for carrying out job analysis is using the services of consultants. Consultants do have the advantage of experience and expertise and can approach a study objectively. However, they may have little understanding of library work which can result in misinterpretations and/or strained relations with library staff. Job analysis is a very complex undertaking and often uses a variety of methods. These may include using job descriptions, questionnaires, interviews, observation, and task analysis.

Job descriptions or position descriptions are summaries of basic tasks performed on a job. They may contribute significantly to a job analysis study but often they are not updated frequently enough and there may be a big difference between what the job is supposed to consist of and the actual duties carried out by the incumbent.

- **Job Evaluation:** Job evaluation is the process of determining the relative worth of the various jobs within an organization. There are many methods which may be used to enable management to determine how much one job should pay relative to others. The point system is the most widely used though ranking, job classification, and factor-comparison are also widely used. There are many difficult problems related to job analysis and evaluation, not the least of which are human problems. Excellent communication is needed and it is essential that staff understand that it is the jobs which are being analyzed and evaluated and not the individuals performing the jobs.
- **Performance Appraisal:** Performance appraisal may be regarded as "referring to a comparatively formal, systematic program of the evaluation of employee performance, developed to improve the quality of judgment applied to that performance and to insure frequent and timely assessments."[29] The importance of an effective appraisal system can not be overemphasized. However, the difficulty of designing such a system, training supervisors, and implementing the system is immense.
- **Staff Training and Development:** As staffing patterns change, new technologies are introduced, and new societal needs are expressed, library staff have an increased need for opportunities for training and development. Dunlap points out that for libraries faced with staff cuts a greater proportion of time will have to be devoted to basic tasks and this leaves less opportunity for extra programs and for staff movement, such as staff rotation. Although training is time-consuming and costly, cutting the budget for it is short-sighted in the extreme. On the other hand, staffs, especially professionals, have as much obligation to assume responsibility for development and continuing education as management has for encouraging it.

5. Conclusion

Academic Library Human resource management must constantly assess how effective the HR function is in the library. To do this, they need to assess their current needs and the climate in their operation. One constant concern is the morale of the employees. Library HRM need to evaluate the nature of the HR function in their organizations. The importance of the human resource process has been stressed, including the need for expertise to enable the profession to make good use of technology and research in the behavioural sciences in adapting to change.

Human resource managers are faced with the difficult problem of improving the effectiveness of their staffs while at the same time providing an opportunity for staff development in times of zero growth or retrenchment. There is a real danger of unfulfilled

expectations leading to lowered morale and its attendant problems. Some suggestions have been made for improve H.R. practices. However, there is no "one right way." Each library must devise its own strategy for maximizing the potential of its human resources.

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Staff Development in University Libraries: *A Crucial Element for the Success of CIS Programme*

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Abstract: Very well informed library staff is one of University libraries greatest assets. A staff that participates in continuing education, Research, Services workshops, and professional activities, and is aware of current trends in librarianship will be inspired to develop creative solutions to issues confronting all Universities libraries. A staff development plan will work to prioritize educational opportunities and research for University library staff to ensure a library's needs are met. Staff development plan it is important to identify core competencies for staff, and the training methods that should be used to ensure all staff will be able to have the skills necessary to do their jobs.

Key words: Staff, Development, University Library, Elements, CIS Programme

1. Introduction

Professional development for University librarians fulfills a need for the continuing acquisition of knowledge and competencies that has not been met by either formal education or research. His need is driven by both the Staff Development (the rapid technological change that characterizes contemporary University libraries), and by the element that University librarians share with other professionals, that they are compensated for what they know as well as for what they do. One essential component of the University librarian's knowledge base is the world of scholarship. As individuals, however, University librarians may be less well served by formal training for the scholarship demands of their own research and publication, particularly in faculty status settings. Professional development programs work well to foster both specific skill-sets and the more diffuse aspects of processing the present University libraries information is considered to be a resource, a product, and thereby a need. Therefore, the problem of developing countries of the world is not merely economic poverty; it is also information poverty, which must be a great concern to human beings. Information is a basic need, and must be a priority. This kind of productive survival information is called Community Information (CI), which is crucial for socio-economic development in developing countries. Community Information Services (CIS) are concerned with the provision of problem-solving information. University Libraries are important institutions in the information society. In India, these libraries have served society in various forms for staff development where there is a crucial shortage of educated and skilled manpower, Research support, and infrastructure. India needs to emphasize community information services development in their development plan because staff development and CIS Services and literacy problems.

2. Needs for Staff Development in University Libraries

In University libraries Need for staff development may arise in a wide range of situations. Each individual University library, however, exhibits its own unique identity composed of organizational structure, types and arrangement of information resources, clientele characteristics and needs, and national relations that all form the work place

culture. University Library Staff development opportunities can help the new librarian put theoretical knowledge into practice, apply generalized concepts to specific responsibilities, and become familiar with given job situations. University librarians are evaluated for their performance in scholarship as well as librarianship, and the requirements of the individual institution and the publishing industry may prompt no small measure of anxiety for new librarians. Library requires that librarians pursue successful research and publication in order to achieve promotion. Programs designed to familiarize librarians with institutional expectations and to de-mystify the writing and submission process can have a positive impact on institutional morale and individual achievement.

3. University Library Professional

In University Library professional the persons of this category generally have high academic qualification. Librarian duties relating to education and research and bear the responsibility of taking policy decisions and they are of the top ranking management. Since they involve in the staff development of innovative methods, new procedures, policies in University library matters and are on decision-making committees. They do require rich practical experience, good knowledge in the professional matters and competence in performance, professionals-professors, and readers of library schools, university librarians and deputy librarians come under these category-professional seniors, and Assist. Professor in library schools and assistant librarians in the university library, college librarians come under professional juniors.

4. University Library Professional Skills

- Technological Skills
- Computer and Information Technological tools using Skills
- Internet searching and networking
- Information Retrieval Skills
- Communication Skills
- Presentation Skills
- Fast Services Skills
- Admin work and Management Skills
- User education Skills
- Staff Development Skills
- CIS gives Services

5. What is (CIS) Community Information Services?

The concept of community information service as a library-based activity is aimed at meeting everyday information needs of the University Libraries. Apart from University

libraries that usually serve the general public, other types of libraries are also expected to provide community information services to the host community. Library-based community information services are still not visible in India Communities both in urban and rural areas. These services are therefore aimed at providing information to improve the well-being of the populace. Put differently, community reference service involves sending University librarians out into the community to work closely with users of the community, conduct onsite reference interviews, appreciate problems and information needs and answer their questions. This process helps the University librarians stay informed on the needs, goals and aspirations of the community; this allows the librarians to showcase their skills and services in various ways, and provide expert and informed assistance at little or no additional cost to the community. Community reference integrates librarians into the community and highlights the skills and services librarians offer always. In the world this unique outreach creates a valuable partnership between communities and the library profession and promotes synergy between them at a time when there is need for communities to support the creation and funding of UGC.

6. Need for Community Information Services

The new technology staff development of information generation and information technology, which has clearly divided the society into two groups i.e. 'have' and 'have not'. The 'have not' group has lead to the formation of a section called 'disadvantaged' and the user under this group are not in a position to help themselves. In this context, there is high need for community information service to help these users. Lot of access to information i.e. both University and Research information is one of the major drawbacks for community development. Access to information leads to deprivation from a certain standard of life. In addition, lot of access to governmental information leads to low participation in governmental processes, which hampers the developmental process of a community and nation.

7. Community Information Services use in University Libraries

University libraries that are entrusted with the basic services of preserving the recorded knowledge of past and present for future use are also responsible for providing required information to the user communities. Besides, in changing situation of society, University libraries are facing new challenges. On one hand there is tremendous pressure due to information explosion, development of new information technologies etc for acquiring latest information on all fields of knowledge, on the other hand there is an increasing demand for pinpointed most exhaustive and accurate information in as well as possible time. Thus in the changing library environment, University libraries have no way other than to shift towards information based community oriented libraries rather than repository centers of books and other documents. Failing which, the existence of these libraries will reduced to the status of a store house of books and other printed documents.

8. CIS through University Libraries Gap between Services and Real Information Need

- Content of library Services
- Lot of understanding
- Information may not reach people
- Absence of community information education
- Insufficient library literacy and in-service training
- Poor organizational structure
- Lot of reading culture
- Types of services and users

9. Providing CIS through University Libraries

- Comprehensive Plan
- Directory of Community Services
- Creation of CIS Working Group
- Develop Guidelines for Setting up CIS
- Content Preparation
- Distribution of Government Information
- Mobile Library Services
- ICT Awareness
- Trainer in Community Empowerment
- Staff Development
- Interdependence
- Evaluation Mechanism
- CIS : A Road Map

10. Conclusion

CIS is an important issue, and it has been theoretically accepted that a University libraries system can play a major role in it. University libraries contribute to the education and research users. University libraries must have an active role in providing appropriate library services to communities. They must build more cooperation with communities to find their real needs. University libraries staff development programs. Library legislation also importance part in University Libraries CIS. Therefore it is concluded that University library is the best organization to provide CIS than any other Organization or agencies. However is the highly essential that once this programme is undertaken by University

Library, the programme should be constantly reviewed and necessary changes and modification should be made to provide effective and efficient community information service (CIS).

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Impact of Information Communication Technology on Information Seeking Behaviour among Users of Engineering College Library: *A study*

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Abstract: The main objective of the study is to examine the impact of Information Communication Technology (ICT) on Information Seeking Behaviour among users of Engineering College Library. The study adopted a questionnaire-based survey research design, 250 questionnaires were distributed among engineering and management students, out of which 240 filled questionnaires were received after duly filled for analysis. The result of the revealed that 80(33.33%) of students visit the library to access the online information, 112 (46.66%) of the respondents stated that they accessed the Internet from their college/departmental computer lab, 96(40.00%) of the respondents used the Computers and Internet for the purpose to look the information in internet, 125(52.09%) respondents satisfied to a large extent over the computer facilities available in the library.

Keywords: Information seeking behaviour, ICT, E-Resources, P.A. Engineering College, Mangalore.

1. Introduction

Enormous growth of information and communication technology has resulted in ever increasing expansion of the flow of information (Ogunsola, 2005). Each and every events of our daily life based on information, without information, it would be complex to exist in the current information based society and the development does not end anywhere as scientific, economical, business and educational fields revolutionizes are happening approximately all moment (Egberongbe, 2011).With the inherent transformation of the concerned our vital need is to be informed of what is going on around us. Ever-increasing rivalry between nations in the field of business, education, science and technology etc directs to the increasing of information and knowledge (Servaes, 2003).With the enormous growth of information and communication technologies, accessibility of information is extremely improved. Persons can get to distinguish a bundle of information without going anywhere has turned into fast and economical (Pegu, 2014). We are living in the information age. Information is a life blood of present society; it is accepted as a key issue in today's competitive world (Hashem, 2008).

Over the last several years, information increased significantly in a large variety of formats .This information excess gave the idea of studying the information seeking behavior of dissimilar groups of users (Fasola and Olabode, 2013). Information need is an individual or groups desire to locate and obtain information to fulfill conscious or

unconscious requirements. Information seeking is a essential activity refers to the method users search for and make use of information to fulfill their information needs and requirements (Khan and Shafique, 2011).

2. Information Seeking Behavior

The concept of information behavior or seeking was invented in the early 1990s, but its origin to the idea of information needs and uses that take place in the 1960s (Aforo, and Lamptey, 2012). At the end of 1970 and in the beginning of 1980 researchers began to understand the term in information seeking, Information behavior, Information needs, and information use (Ikoja-Odongo, and Mostert, 2006). It explains how individuals search, obtain and make use of information in different circumstances (Esew,and others 2014).This understanding assists to prepare plan and suggest academic libraries to supply appropriate information sources and services to users. Role of ICT on Information centers and libraries holds the key to the achievement of updating information services (Atonring, 2015).ICT establish new ways of information handling, it also brings regarding modify in the very organization of information and its communication. Information technology plays a significant role in information gathering and searching behavior of the users particularly the academic community of universities/colleges (Choudhury, 2013). A large amount of information currently accessible in different types of electronic medium which are significantly impact on the information seeking behavior of the users of university/college libraries. In the view of above the present study is to analyze the impact of new information technology on information seeking behavior among users of Engineering College Library.

3. Need of the study

The current ICT and information explosion age has added a new dimension to information seeking activities and produced an enormous set of alternatives for getting information in e-form in excess of the web and using internet. A large amount of information has shifted from print media to electronic media and has also offered multiple accesses to the information sources. The users are more familiar in looking free information over the internet which is accessible 24/7 using World Wide Web (www). In recent years students of all disciplines use e-resources as they are suitable to use and give quick access facilities.The study of information needs and information seeking behavior of college/university library users particularly in developing countries has been a significant area. The present aspiration of information atmosphere is rich as a result universities/colleges are striving to provide the best quality of education to attract users from all over the world. Librarian and library staff have to distinguish and examine the criteria of information seeking and information use by users for providing information services, designing new information systems, intervening in the operation of existing systems.

4. Literature Review

Large numbers of research studies were carried out to measure the impact of information communication technology on information seeking behaviour among users of technical institutions of higher learning across countries. Here a brief account of some studies carried out during last few years. Nadzir (2015) conducted a study to explore information-seeking behaviour among the undergraduate students at the School of Computing, UUM within the context of searching information for university tasks. reveals that majority of undergraduate students prefer to use Google(97.6%) as the main search engine when searching for academic information to complete their Assignments followed by Yahoo(40%) and Ask.com (22.4%). Only 20 % of the students use Google Scholar when searching academic information through the Web. It was found that academic information is the most important information needed by undergraduate students for preparing and completing university tasks. Vera (2015) carried out a study to examine the information seeking behaviour of faculty members of the Federal University of Petroleum Resources (FUPRE). The Population of the study was the full time faculty member in FUPRE. A structured questionnaire was used for data gathering in the University. The research finding show that the respondents use books (print & online) as their preferred source of information, while the major information need of faculty members is academic and research need, the research also showed that faculties demand for information via Google and other online sources. Ebiye (2015) elaborated in their paper on the impact of Smartphone's/Tablets on the information seeking behavior of medical students and staff in Bayelsa State, Nigeria. The study revealed high level of awareness and use of Smartphone's/tablets by medical students and staff for their academic works. The results shows that Smartphone's/tablets has made tremendous impact on their medical education most especially with easy and fast internet access, high speed browsing, saves time and money going to cybercafé/college library, easy access to medical teaching and e-learning materials/e-textbooks.

Tahamtan and others (2015) reveals that 73.6 % of health-care professionals usually accessed electronic resources via handheld computers only 12 health-care professionals accessed drug-related information from drug company representatives. 56 respondents (38.88%) preferred to ask their drug-related questions from faculty members, 41 respondents (28.5%) preferred to consult residents, 29 (20.1%) preferred to consult physicians and 18 respondents (12.5%) preferred to seek answers to their drug-related questions from pharmacists. Results showed that a variety of resources were used, both paper and electronic. Less than half the respondents consulted colleagues, and most participants preferred to ask faculty members about drug queries. The majority of respondents usually used handheld computers to access and store drug information. Lack of access to drug information and lack of time were the main obstacles in seeking drug information. Hsieh and Wu (2015) jointly conducted a study to determine the gender differences in the information seeking behavior of children using child-friendly graphical interfaces.It was found that girls presented a significantly higher success rate, compared to that of boys. The study also observed boys tend to use horizontal search methods, whereas

girls employ vertical search methods and boys were more likely than girls to employ a loopy browsing style in which their line of vision repeatedly swept back and forth across web pages. The study concludes that gender differences exist in the efficiency and effectiveness of the proposed interface. Qualitative observations also revealed gender differences.

5. About P.A College of Engineering

P. A. College of Engineering was established in the year 1999 with an aim to offer a career-oriented professional learning and to make technically knowledgeable engineers with moral and ethical values. It is situated at Konaje, 25 km from Mangalore. PACE is affiliated to the Visvesvaraya Technological University (VTU), Belgaum and is approved by the All India Council for Technical Education (AICTE), New Delhi and recognized by the Government of Karnataka. The institution is dedicated to promote an effective learning environment that encourages excellence and diversity in thoughts and endeavour. Nestled amidst lush greenery, spread across 60 acres, the college offers the perfect setting for an academic environment. It offers undergraduate programs in seven branches of Engineering and postgraduate and doctoral programs in Electronics and Communications Engineering, Computer Science Engineering, Biotechnology and Chemistry.

6. Objectives of the study

- To identify methods of the information seeking of users of P. A. College of Engineering Library
- To study the purpose of information seeking and to explore the use of information communication technology by users of P. A. College of Engineering Library
- To identify the preference often used print and electronic information sources
- To study the impact of Information Communication Technology while seeking information
- To identify the problems faced by the users while gathering information and to suggest overall opinions for the improvement of ICT and service facilities for encouraging the maximum utilization of library resources.

6.1. Methodology

To fulfill the above objectives of the study, a survey method was conducted using a well structured questionnaire. In a total 250 questionnaires were distributed to engineering and management students. Out of which, 240 filled questionnaires were received back. The collected data were classified, analyzed and tabulated by using statistical methods. The present study included engineering and management students of P. A. College of Engineering Library, Konaje, Mangalore.

7. Data Analysis and Interpretation

The data collected are here analyzed and presented in form of tables. The gender wise distribution of the respondents is given in table 1

Table 1: Gender wise Distribution of Respondents

Gender	No. of Respondents	Percentage
Male	96	40.00%
Female	144	60.00%
Total	**240**	**100.00%**

As the gender-wise distribution of respondent users, it was found that maximum 114(60.00%) of respondents are Female, followed by 96(40.00%) are Male respondents.

Respondents were requested to indicate their specific reasons for visiting the library.

Table 2: Reasons for visiting library

Reasons	No. of Respondents	Percentage
To photocopy the materials	15	06.28%
To access online information	80	33.33%
To Study	67	27.91%
To borrow the books	31	12.91%
To access Reference sources	28	11.66%
To Read Newspaper	19	07.91%
Total	**240**	**100.00%**

The above table reveals that most 80(33.33%) of students visit the library to access the online information, whereas 67(27.91%) to study, 31(12.91%) to barrow the books, 28(11.66%) to access reference sources and only 15(6.28%) of respondents visit the library for photocopy the materials.

The respondents were asked to indicate the source for gathering information.

Table: 3. Sources of information seeking

Sources	No. of Respondents	Percentage
Web/Internet	98	40.83%
Discussion with teachers/ colleagues/subject experts	55	22.91%
Searching library catalogue	48	20.00%
By attending conferences/seminars	39	16.26%
Total	**240**	**100.00%**

The above table shows that most of 98(40.83%) of responses point out they are more comfortable utilizing information available on the Web/Internet as their major source of information seeking than other sources, followed by 55(22.91%) are discussion with teachers/ colleagues/subject experts,48(20.00%) searching library catalogue.

Electronic format along with print format have become an essential part of library collection. A large number of electronic resources are being acquired by libraries, so users were asked to indicate their preference.

Table 4: Preference for formats

Format	No. of Respondents	Percentage
Printed format	56	23.34%
Electronic format	88	36.66%
Both	96	40.00%
Total	**240**	**100.00%**

The above table indicated that maximum number 96(40.00%) of respondents prefer information in both print and electronic form, followed by 88(36.66%) are electronic format and 56(23.34%) are printed format.

There are different places obtainable to the learners for accessing the Internet. The users were asked to point out their view concerning where the places are used for accessing Internet.

Table: 5.Place of access internet

Place	No. of Respondents	Percentage
College / Department	112	46.66%
Home	25	10.41%
Library	47	19.58%
Internet café/Computer centre	24	10.00%
Any other	32	13.35%
Total	**240**	**100.00%**

The above table shows that the majority112 (46.66%) of the respondents stated that they accessed the Internet from their college/departmental computer lab, 47(19.58%) from the Library, 25(10.41%) at home, 24(10.00%) at the Internet café/Computer centre, 32(13.35%) of the respondents stated that they accessed the Internet from any other places.

In order to find out the purpose of using Computers and Internet, the respondents were asked to indicate the purpose of using Computers and Internet

Table 6: Purpose of using Computers and Internet

Purpose	No. of Respondents	Percentage
To look for off line information	49	20.41%
To look for information in online databases	56	23.33%

To look for information in Internet	96	40.00%
To look for information in OPAC	39	16.26%
Total	**240**	**100.00%**

The above table demonstrates that the majority 96(40.00%) of the respondents used the Computers and Internet for the purpose to look the information in internet 56(23.33%) used it look for information in online databases, 49(20.41%) used it to look for off line information and 39(16.26%) used it look for information in OPAC.

Table7: Search Engines used to Access Information

Search Engines	No. of Respondents	Percentage
Google.com	113	47.09%
Yahoo.com	73	30.41%
MSN.com Mamma	07	02.91%
Bing.com	03	01.26%
Any others	44	18.33%
Total	**240**	**100.00%**

In an effort to realize which search engine is favored by the sample, a question was posed to the users in order to recognize their preferred search engine(s) when accessing information from the Internet. The results of the study highlights that majority 113(47.09%) of respondents used Google Search Engine to access the information while 73(30.41%) Yahoo, and 44(18.33%) of respondents used other search engines to access the information.

There are various types of e-resources available respondents were asked to point out their preference of the type of e-resources used.

Table 8: Preference for using E – Resources

E – Resources	No. of Respondents	Percentage
E-Journals	48	20.00%
E-books	62	25.83%
E-Technical Reports	25	10.43%
E-Conference Proceedings	16	06.66%

E-newsletters	11	04.58%
E-Tutorials	17	07.10%
E- Databases	31	12.91%
E- Reference resources	07	02.91%
Subject Gateways/ E- portals	13	05.42%
E-Thesis & Dissertations	10	04.16%
Total	**240**	**100.00%**

The above table indicates that majority of the students 62(25.83%) prefer to use E-books, second highest of users prefer e-journals with 49(20.00%), followed by 31(12.91%) e-databases, 25(10.43%) use E-Technical Reports, 16(06.66%) E-Conference Proceedings and only 07(02.91%) use e-reference sources.

The respondents were asked to give reasons as they seek electronic information. The various purposes of seeking e-information are tabulated in the below table

Table 9: Purpose of seeking electronic information

Purpose	No. of Respondents	Percentage
Notes preparations	33	13.75
Article publications	36	15.00
Research works	47	19.58
Academic interests	27	11.25
Building concept/theory	75	31.25
General knowledge	22	9.17
Total	**240**	**100.00**

The purpose for which the E-Resources were used by the Students, as shown in the above table indicated that majority75 (31.25%) of respondents seeking E-Resources for building concept/theory followed by 47 (19.58%) for doing research work, 33(13.75%) for notes preparation, 27(11.25%) for academic interest and only 22(09.17%) are seeking E-Resources for updating general knowledge.

Respondents were asked to about the level of satisfaction of using Information and Communication Technology (ICT) facilities of Library

Table 10: Users satisfaction level in using Information and Communication Technology (ICT) facilities of Library

Facilities	Very large Extent	Large Extent	Some Extent	Less Extent	Very Less Extent	Total
Computers	65	125	39	11	00.00	240
	(27.08%)	(52.09%)	(16.25%)	(04.58%)	(00.00%)	(100.00%)
Internet	73	127	36	4	00	240
	(30.43%)	(52.91%)	(15.00%)	(01.66%)	(00.00%)	(100.00%)
E-resources	56	113	50	21	00	240
	(23.33%)	(47.09%)	(20.83%)	(08.75%)	(00.00%)	(100.00%)
Digital library	19	106	87	26	2	240
	(07.91%)	(44.16%)	(36.25%)	(10.83%)	(0.83%)	(100.00%)
Video Conferencing	25	116	79	19	01	240
	(10.41%)	(48.34%)	(32.91%)	(07.91%)	(0.43%)	(100.00%)

The above table presents that 125(52.09%) respondents satisfied to a large extent over the computer facilities available in the library, 65(27.08%) are satisfied to very large extent, only 11(04.58%) satisfied to less extent. 127(52.91%) of respondents satisfied to a large extent using Internet facilities available in the library, followed by 73(30.43%) very large extent, and only 4 (01.66%) less extent. 106(44.16%) of respondents satisfied to a very large extent and the remaining only 2(0.83%) respondent satisfied very less extent over the digital library sources services available in the library. 113(47.09%) of respondents satisfied to a large extent using E-resources available in the library, 116 (48.34%) are satisfied very less extent over the Video Conferencing services available in the library.

Respondents were requested to point out benefit for using the e-resources compare to print resources.

The above table exhibits that 79(32.91%) of the respondents believed that the use of Information Technology while accessing the information (Electronic Format) has increased their academic activities made easy compared to print format, while 55(22.91%) claimed that electronic format is time saving, 46(19.18%) of respondents pinioned that using Information Technology while accessing the information has improve the quality of work, and 27(11.25%) for more information. From this result of the study, it is clear that the use of Information Technology while accessing the information have positively influenced the educational efficiency of the respondents.

Table 11: Benefits of using Information Technology while accessing the information
(Electronic Format vs. Print Format)

Benefits	No. of Respondents	Percentage
More information	27	11.25%
Improve the quality of work	46	19.18%
Time saving	55	22.91%
Contact with distant professionals	33	13.75%
Academic activities made easy	79	32.91%
Total	**240**	**100.00%**

Table 12: Impact of ICT on information seeking by Users

Impact	No. of Respondents	Percentage
Yes	238	99.16%
No	2	00.84%
Total	**240**	**100.00%**

Since information is accessible in different formats as a result the functioning of ICT, majority 238(99.16%) of respondents point out its impact on their information-seeking behavior. Virtually all users were aware of its impact and found it beneficial.

Table 13: Problems Faced by Respondents while seeking computer based Information

Problems	No. of Respondents	Percentage
Overload of information on the Internet	49	20.41%
Difficulty in finding relevant information	63	26.26%
Lack of training in electronic resources/products	57	23.75%
Slow Internet access	48	20.00%
Lack of time for searching	23	09.58%
Total	240	100.00%

Table above shows that difficulty in finding relevant information is a major challenge faced by respondents 63 (26.26%) while seeking based information. 49(20.41%)

of the respondents are of the view that overload of information on the Internet was also a challenge to information seeking. 57(23.75%)of respondents says lack of training in electronic resources/products while seeking for information.48(20.00%)of respondents posit that slow internet access.

8. Major Findings of the Study

- Out of 240 respondents 114(60.00%) of respondents are Female, followed by 96(40.00%) are Male respondents.
- It is found from the study that 80(33.33%) of students visit the library to access the online information, whereas 67(27.91%) to study, 31(12.91%) to barrow the books, 28(11.66%) to access reference sources.
- While examining the source for gathering information 98(40.83%) of responses point out Web/Internet as their major source of information searching than other sources, followed by 55(22.91%) are discussion with teachers/ colleagues/subject experts, 48(20.00%) searching library catalogue.
- About 96(40.00%) of respondents prefer information in both print and electronic form, followed by 88(36.66%) are electronic format and 56(23.34%) are printed format.
- Majority112 (46.66%) of the respondents stated that they accessed the Internet from their college/departmental computer lab, 47(19.58%) from the Library, 25(10.41%) at home
- About 96(40.00%) of the respondents used the Computers and Internet for the purpose to look the information in internet 56(23.33%) used it look for information in online databases.
- It was found from the study 62(25.83%) of respondents prefer to use E-books, while e-journals with 49(20.00%), followed by 31(12.91%) e-databases, 25(10.43%) use E-Technical Reports.
- Most of the 125(52.09%) respondents satisfied to a large extent over the computer facilities available in the library, followed by 106(44.16%) satisfied to a very large extent using digital library facility, 113(47.09%) of respondents satisfied to a large extent using E-resources available in the library.
- About 79(32.91%) of the respondents believed that the use of Information Technology while accessing the information(Electronic Format)has increased their academic activities made easy compared to print format, while 55(22.91%) claimed that electronic format is time saving, 46(19.18%) of respondents pinioned that improve the quality of work.

9. Conclusion and Recommendations

Development in information communication technology has offered nowadays information seekers vast opportunities to retrieve the information resources in multiplicity

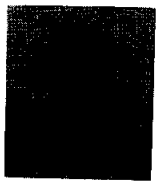
of formats, such as e-resources, CD-ROMs, databases, Web-OPACs, and the Internet.The rapid development in information and communication technology particularly the Internet is changing the patterns of information-seeking behavior of individuals. Information seeking behavior of library users are changing due to the impact of information technology. On the basis of the findings of the study, the following recommendations have been made. The results of study reveals that assistance requires in the effective use of library resources, therefore the library should organize various user education/orientation programs for effective use of available print, electronic resources and develop the information searching skills. The engineering college library should facilitate internet connection speed to enable students make use of the available electronic databases. At present, e-Resources are of vital importance so the teachers/staff encourage the students for the use of electronic information resources, and to create more awareness on e-resources Furthermore, college library as increasing the number of infrastructures i.e. computers, internet connection and other requirements related to access of e-resources. It is also recommended that library professionals have to educate the learners within the e-environment as per the changing needs and should direct them in using wide-ranging information searching tools with effectiveness.

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Individual Behavior in the Emerging Information Environment

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Abstract: Man is a social being having a unique character and personality that shapes his behavioral pattern in the emerging information environment. He has been concerned about his own nature from time immemorial ' A bundle of habits, he prefers to avoid anxieties . he looks back to his post legacies and knows that his future will be shaped by his present actions. He is an information generator and possesses the ability to cultivate linguistic symbols. His mental abilities facilitate his work as a manipulator and controller of things. He can work as an information processor and in the process his behavior can be complexly organized and interrelated to convert inputs into a variety of possible outputs or performances. Today use of computer proves that it is nothing but a similar system of functioning of the human brain.

Keywords: information environment, user behavior

1. Introduction

It has been very aptly said that man is a social animal who loves to live in society and abhors solitude. God has gifted him with a unique personality and psyche which together go a long way in molding his behavioral patterns. In the emerging information environment, he can work like an information processor as his brain functions exactly like the computer. By virtue of his immense mental abilities he is capable to manipulate and control the processing of information. However, in the process, his behavior gets complexly organized and interrelated to convert inputs into a wide variety of possible out puts. From time immemorial, man has been devoted to improving himself, his surroundings and his facilities and means therefore, individual behavior becomes all the more important in the fast emerging information environment.

2. Individual Behaviour

He is an individual, not merely evolving but developing himself by his own active encounter with rest of being. He controls and manipulates his environment in the ways that facilitate adaptation. Describing various characteristics of man Gottschalk (1969) has stated that:

"...as a thing, he has physics and chemistry. As an animal he has ancestry, a physiology and a psychology. As a human being, he has institutions, situations, traditions and aspirations, and is subject to both inward and outward psychological urges and pressures"

Human happiness consists not in the outward and visible blessing of fortune, but in the inward and unseen perfections and riches of mind (Anarcharis). The study of man's higher mental processes has always been an important and fascinating endeavour. His ability to use language, his remarkable memory, his ability to reason, and think abstractly is high on the list of characteristics which distinguish men from other animals (Foley, et al., 1970). A human being is a complex thing. It is not because of

man's physical appearance or his chemical composition, but primarily because of the great variety of his behavior. His behavior in its simplest from can be seen as a person's response to stimulus in the environment (Tripathi,1992). The classical S→R scheme suggests stimulus cause a response or behavior. This model focuses on Stimulus→ Response as a basic unit of learning. The capacity to learn endows people with an almost limitless ability to adjust to a variety of environments with relatively enduring patterns of behavior.

Human beings use sense organs to receive impulses from environment; the brain interprets these impulses that lead to decisions on how to respond. From this perspective, every human being is an information system (Boddy and Paton, 1998). An individual as a system constituent processes energy, materials, information; interacts with a given environment, at a given time and at a given state of equilibrium and internal consistency. People organize their knowledge about themselves and the world, into what is called "personal constructs" which are employed to understand events and guide their behavior (Kelly, 1955). The primary motivational goal, according to Kelly, is the expansion and validation of one's construction system (Atkinson and shiffrin, 1968). Harvey, Hunt, and Schroder's (1961) " conceptual system", to explain human behavior is somewhat similar to Kelly's, but more formally stresses different modes of processing and combining information from the environment in an organized way.

3. Man as Information Generator and Processor

Behaviour is an information processing sequence of decisions and the process underlying behavior are complexly organized and interrelated to convert input (information from one's environment) into a variety of possible outputs or performance.

Human being has ability to learn and utilize alternative meanings of the same stimulus and to build up and use different patterns of interrelationships within the same set of meanings (Gordon, 1999). Human information processing has often been compared to that of a computer. Computer technology has opened up exciting new vistas in the objective study of human thoughts. The invasion of computer has provided that a machine could perform many operations previously denied to men by behaviouristic theories, such as comparing, rejecting, evaluation, and decision-making.

Human information processor, like its electronic counter-part, is capable of receiving information, operating upon it according to certain rules, sorting the results of these operations in memory (Sowa, 1984; NSW HSE online, 2008), altering the contents of certain areas of memory. Information is received by sensory memory. The memory accepts all sensory information in a fairly complete form, but it does not hold it for very long. The short-term memory is really a working memory, a place where conscious mental processes are performed. This memory segment has limited capacity, and cannot hold information for more than 15 second. Long-term memory is the final

component of the memory system in which vast amount of information can be held. Retrieving information from long-term memory essentially consists of taransferring the information back to short-term memory where one can consciously deal with it. Human information processing, like a computer, would follow specified sequence and follow certain rules.

The brain processes correspond to such activities as perception, memory, thinking, and language are much more complex than any existing computer. Rather, computer model provides a general way of thinking about human cognitive system. A coherent approach to understanding cognitive processes can be provided by conceptualizing information processing as occurring within a cognitive architecture (Lord and Maher, 1991). The cognitive architecture details the nature and organization of memory, easily performed cognitive operations; and a control structure that sequences the information processing.

4. Conclusion

To sum up, individual behavior is a matter of great importance in the rapidly emerging information environment where man is the prime information generator as well as processor because of his great mental abilities. These abilities render him a manipulator and controller of informational services. However, his behavior is sometimes complex in the organization and interrelation while converting inputs into a wide variety of possible outputs. Man has been able to reach this advanced stage as an information processor in the emerging information environment due to the sheer fact that he is a curious being who is never satisfied with what he knows and moves on and on in the fields of limitless knowledge therefore, his behavior is very important in the present information environment.

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Information Seeking Behaviour of Woman Law Professionals: A Study

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Abstract: Adequate knowledge about the information seeking behaviour of users is vital for developing library collections, services and facilities to meet their information needs effectively. The paper describes which involves examining the information use pattern of the woman law professionals in Nagpur city. The findings indicate that woman practicing lawyers were using a variety of information sources to satisfy their information needs. The majority of respondents are using the Internet and e-resources to access information. They preferred to their personal library before resorting to other information providing sources and agencies They often found it difficult to find the information they were looking for when using digital law libraries. The present study observed that majority of respondents was not aware of e-resources. On the whole, respondents perceived bar library collections, services and facilities as adequate to meet their information needs effectively.

Keywords: Information use pattern, information seeking, law reports, Information sources

1. Introduction

The concept of life is vague without information. Information has enabled a man to perform his routine activities in an efficient way. For decision-making, we need the support of information (Kumar, 2004). Modern society depends on information for all its activities. Every person has the need for information. Without valid and up to-date information, it is impossible to do progress in any field of life (Bajpai, 1999). In recent era, the term information refers to facts and opinions provided and received during a course of day to day life. One directly obtains information from other living beings, mass media, and electronic database and all sorts of natural observable phenomenon of the surrounding environment. This paper presents findings of a research study on how women in law professions seek information on their daily work. We begin with the premise that in order to analyze information seeking, we need to examine the context of the overall information task.

2. Objectives of the Study

- To find out the sources and references used by the woman law professionals to acquire information.

- To identify the information needs of the woman law professionals and the sources of information used by law professionals.
- To study their purpose of information seeking and information seeking behaviour.
- To identify factors militating against effective provision of information services.

3. Methodology

Questionnaire was used to collect the relevant data from the woman law professionals in Nagpur City. In this paper an attempt has been made to analyze and interpret the data collected on information seeking behaviour by woman law professionals. The structured questionnaire was prepared and distributed to woman law professionals. The collected data are in the form of tables, figures and analyzed by using a simple method of calculation.

4. Scope and Limitations of the Study

The findings of the study are practicing woman lawyers of district court and high court in Nagpur city. It was limited to Nagpur city.

5. Data Analysis and Discussion

Data were collected through the distribution of questionnaires among the woman law in Nagpur city. One hundred and fifty two questionnaires have been analyzed below.

Table 1: Academic Qualification of Law Professionals

Sr No	Lawyers	Total Respondents	Percentage
1	LLB	4	2.63%
2	B.A.LLB	56	36.84%
3	B.A.LLM	4	2.63%
4	B.Com LLB	68	44.73%
5	LLB LLM	4	2.63%
6	M.Com LLB	14	9.21%
7	MA PRPM,DBM,LLB	2	1.31%

Frequency distribution of respondents academic qualification presented in Table 1, shows that 68(44.73%) were B.Com LLB 56(36.84%)were B.A LLB, fourteen 14(9.21%)were M.Com. LLB, 4(2.63%)were LLB, B.A.LLM, LLB.LLM. and2(1.31%) were MA PRPM, DBM, LLB.

Table 2: Category of Law Professionals

Sr No	Lawyers	Total Respondents	Percentage
1	District Court	148	97.36%
2	High Court	48	31.57%
3	MAT	100	65.78%
4	Other	12	7.89%

Table 2 ,it was observed that the highest number of 148(97.36%)woman law professionals were registered under district court,48(31.57%) were registered under MAT 100(65.78%) were registered under high court and 12(7.89%) were registered under the others.

Table 3: Different Types of Formal Sources Used by Law Professionals

Sr No	Information Sources	Total Respondents	Percentage
1	Textbook	132	86.84%
2	Reference Books	144	94.73%
3	Legal Databases(Online)	112	73.68%
4	Legal Databases(Offline)	120	78.94%
5	Bare Acts(State)	128	84.21%
6	Bare Acts(Central)	148	97.36%
7	Law Journals/Reports/Digest/magazine/ Dictionary/Thesaurus/ commentaries/ Glossary/ Bibliography	116	76.31%
8	Conference Proceedings	108	71.05%
9	Any other please specify	136	89.47%

From table no.3 , It was observed that one hundred and forty four (94.73%) law professionals used the reference books, 144(97.36%) law professionals used central bare acts, 148 (97.36%) law professionals used state bare acts, 132(86.84%) law professionals used textbooks, 116 (76.31%)law professionals used law journals/reports, digest, magazine, dictionary, thesaurus, commentaries, glossary, thesis, bibliography, 112 (73.68%) law professionals used online legal databases, 120 (78.94%) law professionals used offline legal databases, 108(71.05%) law professionals used conference proceedings,

and136(89.47%) law professionals used any other but they had not mentioned any source to collect information need.

Table 4: Different Types of Informal Sources Used by Law Professionals

Sr No	Information Sources	Total Respondents	Percentage
1	Discussion with Colleagues/ Legal Professional	136	89.47%
2	Consulting with Resource Person in the Legal Professional	40	26.31%
3	Any Other please specify	4	2.63%

The Table No. 4., it is observed that law profeesionals used various types of the information sources. 136(89.47%)law professionals discussed with colleagues/ legal professionals, 40(26.31%) law professionals were consulted with resource person in their legal field. 4(2.63%) law professionals used any other but they had not mentioned any source to collect information need.

Table 5: Use of Electronic Information Sources by Law professionals

Sr. No	Information Sources	Total Respondents	Percentage
1	CDROM Databases	76	50%
2	Internet(E-Books, E-Journals)	128	84.21%
3	Any Other Sources	10	6.57%

From Table 5, it was observed that 128(50%) law professionals used of Internet, 76(50%) CD ROM databases, 6.57% law professionals used other sources. The law professionals were not mentioned any other sources to collect information need.

Table 6: Refer Periodicals and Journals by Law professionals

Sr No	Periodicals/Journals	Total Respondents	Percentage
1	All India Reporter	96	63.15%
2	Maharashtra law Journal	20	13.15%
3	Labour Law Journal	16	10.52%
4	Current Legal Legislation	136	89.47%
5	Supreme Court Cases	12	7.89%
6	Law Teller	32	21.05%
7	Legal News & Views	0	0%
8	Indian Bar Review	88	57.89%
9	Current Civil Cases	4	2.63%
10	Tax & Corporate Reference	4	2.63%
11	Foreign Journals	0	0%
12	If Any please specify	0	-

From the table 6 indicates the 96(63.15%)% law professionals used all India reporter, 12(7.89%) law professionals used supreme court cases, 20(13.15%) law professionals used Maharashtra Law Journals, 4(2.63%) law professionals used current civil cases, 16(10.52%) law professionals used labour law journal, 136(89.47%) law professionals used current legal legislation, 88(57.89%) law professionals used Indian bar review, 32(21.05%) used law teller, 4(2.63%) law professionals used tax & corporate reference and current civil cases. No one used foreign journals.

Majority of law professionals used all India reporters for their information needs.

Table 7: Services Rendered Usually to the Law Professionals by Library

Sr. No.	Details	Total Respondents	Percentage
1	Reference Services	40	26.31%
2	Current Awareness Services	20	13.15%
3	SDI Services (Selective Dissemination Services)	0	0%
4	Reprographic Services	44	28.94%
5	Book Lending Services	28	18.42%
6	Reader's Advisory Services	112	73.68%
7	Display of New Arrivals	112	73.68%
8	Newspaper Clipping Services	84	55.26%
9	Latest Addition List	44	28.94%
10	Inter Library Loan Services	0	0%
11	Translation Services	0	0%
12	Computer and Internet Services	108	71.05%
13	Others	0	0%

The above table 7, 40(26.31%) law professionals were aware and utilised the reference service rendered in the library. 20(13.15%) law professionals were aware of CAS(Current awareness service), CAS service is rendered in the library. 44(28.994%) law professionals used the reprographic service for refer the law reference in their cases. 28(18.42%) law professionals were aware and make e of the book lending service rendered in the library. 112(73.68%) law professionals were aware of the readers advisory service. 112(73.68%) law professionals were aware and utilised the display of arrivals in the library. 84(55.26%) law professionals were aware and utilised the newspaper clipping service in the library. 44 (28.94%) law professionals were aware of the latest addition list.

They were not aware of inter library loan service. Majority of the users were not aware of such facility. From the study, this service was not rendered in the library. Not a

single response received to the translation service. The reason was that court library was not rendering the translation service to its users. 108(71.05%) law professionals were aware of the computer and internet services rendered by the library. Not a single users rendered the SDI (Selective dissemination service) service.

Table 8: Types of Information Often Required by Law Professionals

Sr No	Details	Total Respondents	Percentage
1	Procedural Information	108	71.05%
2	Information for the Article	104	68.42%
3	Information for writing review	80	52.63%
4	Information for preparing the project	20	13.15%

The table no. 8 observed that 108(71.05%) law professionals required procedural information, 80(52.63%) law professionals required information for writing review, 104(68.42%) law professionals required information for the article and 20(13.15%) law professionals required information for preparing the project.

Majorities of the law professionals often required procedural information.

Table 9: Gather Information by Law Professionals

Sr	Details	Total Respondents		Percentage
1	By discussing with colleagues	144	94.73%	
2	By attending conferences/ Seminars/ Symposia etc.	68	44.73%	
3	By Visiting Exhibitions	40	26.31%	
4	Through Scanning Literature	52	34.21%	

Above the table no 9 observed that law professionals, 144(94.73%) of the law professionals gathered information by discussing with colleagues,68(44.73%) of the law professionals gathered required information by attending conferences, 52(34.21%)law professionals gathered information through scanning literature and 40(26.31%)law professionals gathered required information by visiting exhibitions.

Table 10: Various Reasons for seeking information by Law Professionals

Sr. No.	Purpose of Visit	Total Respondents	Percentage
1	For Preparing Case Papers, Case Laws of High Court/ Supreme Court	152	100%
2	For Law Reference	132	86.84%
3	For Updating Knowledge	116	76.31%
4	For Constitutional Information	44	28.94%
5	For Study or Research work	48	31.57%
6	For Spending Leisure Times	68	44.73%
7	Any Other Purpose (Please Specify)	4	2.63%

From the above study, table no. 10 observed that 152(100%) law professionals were seeking information for preparing case papers, case laws of high court/supreme court, 132(86.84%) law professionals were seeking for law reference, 116(76.31%)law professionals were for updating knowledge, 44(28.94%) law professionals were for constitutional information, 48(31.57%) were for study on research, 68(44.73%) were for spending leisure times. 4(2.63%) were used for anu other purpose .

Table 11: Methods used for seeking information by Law professionals

Sr No	Details	Total Respondents	Percentage
1	Consult Knowledgeable Person in the Field	124	81.57%
2	Discussion with Colleagues	124	81.57%
3	Review Article	96	63.15%
4	Browsing on Internet	116	76.31%
5	Any Other	0	0%

Table 11 was observed that 124(81.57%) law professionals consulted knowledgeable person in the field, 124(81.57%) law professionals discussed with colleagues, 96(63.15%) law professionals reviewed articles, 116(76.31%) law professionals were browsing internet as a method.

The table no. 12 observed that 128(84.21%) law professionals used law journals, 128(84.21%) law professionals used current law reports. 124(84.57%) law professionals used browsing internet for legal databases, 104(68.42%) law professionals used conference proceedings, 76(50%) law professionals used scanning of current issues or online journals, 44(28.94%) law professionals used attendances of conferences/ seminars/workshops, 20(13.15%) law professionals used services from SDI(Selective Dissemination Service),16(10.52%) law professionals used services from CAS(Current

Awareness Service), 4(2.63%) law professionals used the other sources for their current developments.

Table 12: Seeking Information for Current Developments by Law Professionals

Sr. No.	Details	Total Respondents	Percentage
1	Through Current Law Reports	128	84.21%
2	Law Journals	128	84.21%
3	Browsing Internet for Legal Databases	124	81.57%
4	Through Conference Proceedings	104	68.42%
5	Scanning of current issues or print/online journals	76	50%
6	Attendances of Conferences/ Seminars/ Workshops	44	28.94%
7	Through Services from SDI	20	13.15%
8	Through Services from CAS(Current Awareness Service)	16	10.52%
9	Any Other	4	2.63%

Table 13: Acquire information for research work by Law Professionals

Sr No	Details	Total Respondents	Percentage
1	Field Trips	72	47.36%
2	Foreign Trips	4	2.63%
3	Conferences	56	36.84%
4	Invisible College	40	26.31%
5	Keeping up-to-date	108	71.05%

Table No. 13 observed that 108(71.05%) law professionals was keeping them up-to-date by acquiring information. 72(47.36%) law professionals acquired information through field trips. 40(26.31%) law professionals followed invisible college. The law professionals used for acquiring information through the practice of communicating with subject experts, colleagues and co-researchers. They were never utilised it consciously as a method of acquiring information. 56(36.84%)% law professionals obtained information through conferences. Only 4(2.63%)law professionals had gone to foreign trips for research work. It was observed through the interviews that foreign trips related to the topic of research were necessary as the material, which is indispensible for research was not available in India. Most of them expressed that lack of financial assistance was the main obstacle for foreign trips.

Table 14: Channels to access information by Law Professionals

Sr No	Details	Total Respondents	Percentage
1	A Skilling author for the reprint	44	28.94%
2	Through Telephone	64	42.10%
3	Through E-Mail /Internet	132	86.84%
4	Personal Visit to a Subject Specialist	92	60.52%
5	Attending Seminars, Conferences, Symposia	88	57.89%
6	Accessing Online Databases	80	52.63%
7	Through Fax	8	5.26%
8	Personal Collection	116	76.31%
9	Personal Collection of Colleagues	88	57.89%
10	Visiting Libraries	24	15.78%
11	Any Other Channels	0	0%

Table 14 that the 132(86.84%) law professionals accessed through email/internet, 116(76.31%) law professionals accessed through personal collection, 92(60.52%) law professionals accessed through personal visit to a subject specialist, 88(57.89%) law professionals accessed through personal collection of colleagues , 80(52.63%) law professionals access through accessing online databases, 64(42.10%)% law professionals access through telephone, 88(57.89%) law professionals access through attending seminars, conferences, symposia, 24(15.78%)law professionals accessed through visiting libraries, 44(28.94%), law professionals accessed through skilling author for the reprint, 9.14% law professionals accessed through fax.

6. Conclusion:

The study investigated the information seeking behavior of woman law professionals in Nagpur city. It was found that respondents used a variety of information sources for legal practicing. Books, law reports and statues were considered more important. It is interesting to note that, although respondents perceived the Bar library as effective in meeting their information needs, they preferred to first consult their personal library. Electronic resources have become the vital part of human life in the present day. It has rapidly changed the way of seeking and disseminating information. It is clear from the study that electronic resources are useful to legal professionals in Court Bar libraries. It might be due to the lack of awareness about their availability, improper selection of materials or unfamiliarity with these products. Therefore, still there is a vast scope of future research.

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Internet Use among University Students: *A Case Study of Bangalore University of Karnataka, India*

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Abstract: The study has been made an attempt to find out the use and purpose of computers and internet and the purpose of using it in academic environment by the postgraduate students of colleges affiliated to Bangalore University. Structured questionnaires were used as a tool for data collection.

Key words: Internet Use, computer skills, purpose of using internet

1. Introduction

The rapid developments of Information and Communication Technology (ICT) have made vivid changes in every walk of human's life. The academic activities of an education system are also not an exception to this phenomenon, computer technology and internet technology were emerged as a strong tool in our education system and it influenced the students and the teachers to become a computer-savvy and internet-savvy. The use of Internet has become a very popular in many areas as well as in education in recent years. Accordingly, Internet access in schools has increased greatly over the last 20 years (Berson, 2000). As this study has shown, more students are relying on the Internet for their academic needs than any other areas.

The present study has been made an attempt to study the purpose of using internet and its frequency and basic knowledge and basic skill in the use of computers and internet among the postgraduate students of the colleges affiliated to Bangalore University, Bengaluru.

2. Review of Literature

Dominika Sokol and Vit Sisler (2010) conducted a Study on Internet Use among University Students in the United Arab Emirates. The study aims to analyzes socializing on the Internet and attitudes towards the Internet as a medium of social interaction among university students in the United Arab Emirates (UAE). The result reveals that the Internet can largely act as a vehicle for resisting social exclusion and gender segregation; it can also simultaneously serve as a mechanism for reinforcing pre-existing norms within newly networked traditional communities. Sakina Bashir (2011) conducted a study on Internet Use among University Students: A Survey in University of the Punjab, Lahore. The objective of the study was to explore the Internet use behaviour of students. The results show that

most of the students use this technology for course related reading and research needs. They are new users of the Internet. They use it at the University Library's Digital Lab Unit as well as their departments and homes. A large number of them have learnt to use the Internet tools by themselves, or relying on assistance from friends without attending any formal training programs. Ease of work and time saving are the reasons of Internet use among university students.

Biradar and others (2006) conducted a study on internet usage by the Student and faculties in Kuvempu University. The results indicated that 42.1 % students use internet twice a week and 31.25% faculties use it every day. The majority of students as well as faculties use Internet for study/ teaching purpose. The favorite place for using Internet is library followed by commercial places. A thumping majority of respondents are satisfied with Internet sources and services. Rajeev Kumar and Amritpal Kaur (2004) studied the use of internet by teachers and students in Shaheed Bhagat Singh College of Engineering & Technology, Ferozepur (Panjab). They found that 46.7% teachers and 36.7% student's daily use the internet. About 90% respondents use internet at their college. Yahoo is found as the favorite search engine. Only 31.7% respondents were fully satisfied, whereas 36.7% were partially satisfied with internet facilities.

3. Objectives of the study

The study has been conducted with the following objectives:

- To find out the access point of computers and the Internet used by the University students
- To find out the preferred form of connectivity used for internet connection
- To study the basic knowledge and competency level in the use of computers
- To study the basic knowledge and the skills in the use of the internet
- To know the purpose and frequency of internet use in the academic environment by the University Students

4. Methodology

The study has been carried out by the survey strategy among the postgraduate students of the colleges affiliated to Bangalore University, located in Bengaluru City. 138 respondents from the colleges affiliated to Bangalore University were participated in the present study. Structured questionnaires were administered randomly among respondents of selected institutions located in Bengaluru city for data collection and received filled questionnaire from 30 institutions. The duly filled questionnaires were analyzed by using Statistical Package for the Social Sciences (SPSS 21) and the data were presented in the form of tables and charts.

5. Scope and Limitation of the study

The study population is limited to Postgraduate students of colleges affiliated to Bangalore University, located in the Tumkur City and Bengaluru City. The institutions affiliated for the academic year 2013-14 have been considered for the study. In order to identify the affiliated institutions the prospectus of the Bangalore University is used.

6. Data Analysis, Interpretation and Observations

- **Distribution of the respondents**

Table 1: Distribution of respondents

Sn	Gender Distribution of Respondents	
	Gender Category	No. of Respondents
1.	Male	70 (51%)
2.	Female	68 (49%)
	Total	138 (100%)

In this survey total 138 responses were received, 51% of Male respondents and 49% of female respondents were took part in this study.

- **Study Discipline of Respondents**

Table 2: Study Discipline of respondents

Sn	Study Discipline of Respondents	
	Study Discipline	No. of Respondents
1.	Sciences	33 23.9%)
2.	Social Sciences	16 (11.6%)
3.	Humanities	10 (7.2%)
4.	Commerce and Management	79 (57.2%)
	Total	138 (100%)

According to the table 2 more number of responses received from the students of commerce and management and less number of responses received from the students of Humanities.

- **Access point of computers and Internet**

The survey was aimed to know the respondent's access point of computers and internet. The table 2 has been depicted the details of the availability and accessibility of computers and internet.

Table 3: Availability of computer and internet facility

Sl no	Availability of Computer and Internet Facility							
	Computer at Home		Computer at Institution		Internet at Home		Internet at Institution	
	Yes	No	Yes	No	Yes	No	Yes	No
1	119 (86.2%)	19 (13.8%)	138 (100%)	0 (0%)	114 (82.6%)	24 (17.4%)	138 (100%)	0 (0%)
Total	138 (100%)		138 (100%)		138 (100%)		138 (100%)	

The Table 3 shows the details on the availability of computer facility and internet facility at home and at the institution. It depicted that, 86.2% of students are having computer facility at Home and 13.8% of respondents don't have the computer facility at home and 82.6% of the respondents are having internet connectivity at their home and 17.4% of students doesn't have internet facility at their home. 100% of respondents are accepted that they are having computer and internet facility at their college.

- **Preferred form Internet connectivity: A comparative study**

The study has been made an attempt to know and compare the preferences given for the form of internet connectivity used by the respondents. The data presented in the table 4.

Table 4: Preferred form of Internet Connectivity used by the students

Sl no	Preferred form of Internet connectivity Facility					
	At Home			**At Institution**		
	Wired	Wireless	None	Wired	Wireless	None
1	47 (34.1%)	67 (48.6%)	24 (17.4%)	136 (98.6%)	2 (1.4 %)	0 (0%)
Total	138 (100%)			138 (100%)		

The table 4 depicts that, 48.6% of respondents are using wireless internet connectivity, 34.1% of students are using wired connectivity and 17.4% of students doesn't have internet connectivity at their home. At the colleges 98.6% of respondents are using wired connectivity for internet and only 1.4% of students are using wireless internet connectivity at their colleges.

- **Basic knowledge and skills in the use of computers**

One of the objectives of this study is to assess and know the basic skills and competency in the use of computers. The data presented in the table 5 and in the figure 1.

Table 5: Competency level in the use of computers

Sl no	Computer Knowledge	Competency level				
		Very Poor	Poor	Average	Good	Excellent
1	Customizing Desktop environment	0	2	9	27	100
2	Windows Installation	0	2	16	23	97
3	M S Word	0	0	0	25	112
4	M S Excel	0	0	3	21	114
5	M S Access	2	9	11	20	96
6	M S Office Publisher	5	12	10	24	87
7	M S Power Point	0	2	0	21	115
8	Web Publishing	2	4	14	19	99

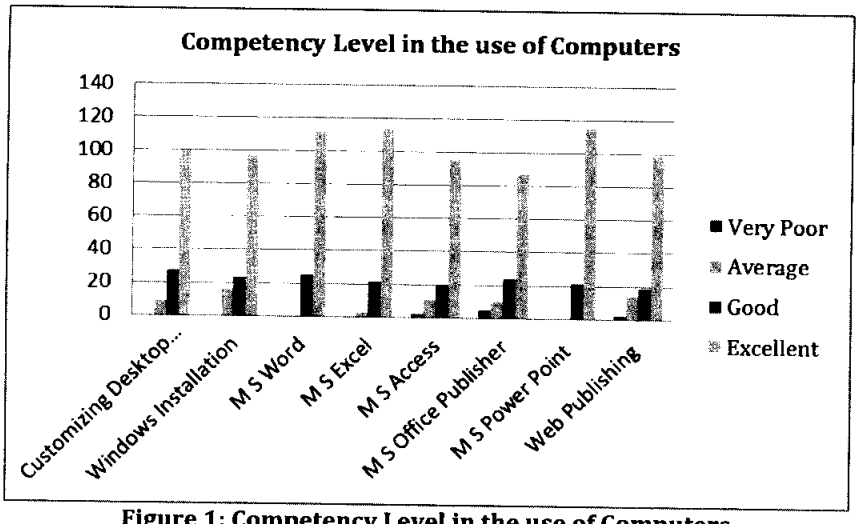


Figure 1: Competency Level in the use of Computers

The above table 5 and figure 1 shows that, among the 138 respondents 83.5% of the students are excellent in use of MS Word, MS Excel and MS Power Point Presentation. 71% of students are excellent in customizing desktop environment, windows installation and in web publishing. It is observed that, compare the competency in MS Word, Excel and PPT the competency level in the use MS Access and MS office publisher is low.

- **Competency level in the use of Internet**

The study made an attempt to explore the competency level in use internet among the respondents of colleges affiliated to Bangalore University. Respondents were requested through questionnaire to provide the details about their competency level in the use of the Internet. The data were presented in the following table 6. It depicts that, 78.3% of the

students are excellent in write, send and receive email, in downloading music and software from internet

Table 6 – Competency level in the use of internet

Sl no	Activities	Competency Level				
		Very Poor	Poor	Average	Good	Excellent
1	Write, send & receive email	0	0	3	27	108
2	Copy/download files from the internet	0	0	2	28	198
3	Attach a file to an E-mail message	1	0	4	29	104
4	Download music from the Internet	1	4	0	27	106
5	Download software from the Internet	1	0	8	28	101

- **Purpose and frequency in the use of internet**

The survey was aimed to know the purpose of using the internet and use frequency for the particular purposes in their academic environment. Data presented in the following table 7.

Table 7: Purpose and frequency in the use of Internet

Sl no	Activities	Purpose and frequency in the use of Internet				
		Never	Rarely	Sometimes	Often	Always
1	Study	0	0	0	17 (12.3%)	121 (87.7%)
2	Surfing and Browsing	0	0	0	27 (19.6%)	111 (80.4%)
3	Sending E mails	0	0	0	21 (15.2%)	117 (84.8%)
4	Prepare Presentations	0	0	0	32 (23,2%)	106 (76.8%)
5	Preparing Assignments	0	0	0	33 (23.9%)	105 (76.1%)
6	Literature Search	0	2 (1.4%)	0	33 (23.9%)	103 (74.6%)
7	Online Shopping	0	4 (2.9%)	7 (5.1%)	22 (15.9%)	105 (76.1%)
8	Playing Games	0	2 (1.4%)	11 (8.0%)	20 (14.5%)	105 (76.1%)
9	Download Music/Movies	0	0	7 (5.1%)	22 (15.9%)	109 (79.0%)

The data in the table 7 show that, average of 84% of the students are always using internet for Study purpose, sending emails and for surfing and browsing and average of 64% of students are using internet always for preparing assignments, presentation, for literature search, online shopping, to play games and to download music and movies from the internet.

7. Findings

- Majority of the responses received from the discipline commerce and management students and least responses received from the discipline humanities.

- Students are using wireless internet connectivity at their home and wired internet connectivity at their colleges
- 100% of the students accepted that computer and internet facilities are available in their studying colleges.
- Majority of the students are having excellent skills in the use of computers.
- Majority of the students are having excellent skills in the use of internet.
- Majority of the students are using internet for study purpose, for surfing and browsing and to send e-mails.

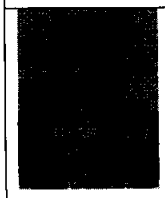
8. Conclusion

The survey was aimed to study the basic computer and internet skills possessed by the respondents of the colleges affiliated to Bangalore University. The study enlightened that the students are using computers and internet in their academic activities. Majority of the student's knowledge and skill in the use of computers and internet is excellent but it is not 100%. Libraries can arrange special lectures and workshop programs to build confidence among the students responded as their skill is average and good in the use of computers and internet.

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Investigation and Analysis of Information Seeking Behaviour and Satisfaction of Library Users in Digital Era: *A Case Study of RaiSahabBhanwar Singh College, Nasarullahganj, Sehore (MP)*

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Abstract: The present study was undertaken with a view to know the basic information needs, seeking behavior and satisfaction of library users of RaiSahabBhanwar Singh College, Nasarullahganj, Sehore (MP) in this digital era. Questionnaire method was used to collect the data. A well structured questionnaire, a total 200 were distributed to the UG and PG students and 169 filled in questionnaires were received back with overall response rate @ 84.50%. In the present survey, an attempt has been made to explore utility of different types of resources and users needs. The study also aims to indentify the level of satisfaction with the information resources, services and library staff cooperation offered by the library. The results reflect that the majority of the respondents using institute library to get their desired information and are satisfied with availability of information resources that facilitates to support their academic and developmental activities. It has been observed that more than 51% of the respondents were partially satisfied and nearly 33% were fully satisfied with the overall library services, information resources and helpfulness of library staff. Finally, it has been suggested that libraries should organize information literacy programmes for its users regularly.

Keywords: Information Seeking Behaviour, User Satisfaction, Library Resources & Services, ICT, Digital Environment

1. Introduction

Information is a basic resource, an integral part of human activity, and it plays a vital role in the scientific and technological progress of a country. Information plays a significant role in our personal as well as professional life. Information is growing day by day in different formats viz. primary, secondary and tertiary and available in different channels, formal and informal. Psacharopoulous (1982) discusses the necessity of information in the present age as "we can reorganize the educational system and redefine scientific research only with the help of information". According to Mahapatra (2014), "library being a service institution primarily provides information to its users. The provision of information disseminated by the library has significant value for the end users. The satisfaction that the users derive by obtaining such information is of immense value for their academic and research career as well as the library itself. In order to satisfy the user groups in a library, it is essential to identify the information needs of users and to determine the strategy of seeking information in a library. Once the information requirement is established and seeking behavior is determined, the library is able to develop its collection, improve its organizational work and provide right dissemination of information services".

In this era of information explosion (in print as well as in digital form), peoples/users are confused about the access to right information, information needs, and

various information sources. Again information access varies from person to person according to their needs. Thus, information seeking is a kind of communication behavior, which surely be influenced by many factors. It is necessary to know the information needs, seeking behavior and information sources used by the user community, in order to plan and develop a need-based and relevant collection of information resources in print as well as in electronic resources in this changing world wide digital environment.

2. Information Seeking Behaviour

Information Seeking Behavior is a broad term, which involves a set of action 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. "The study of information seeking behavior can be dated back to the late 1940's. Since that time a large number of studies have been carried out on the various aspects of information seeking behavior of individuals in different fields of specialization. Behavior of users towards seeking information depends upon the type of problem they undertake for research/study, availability of time, teaching requirements, information need and availability of sources of information. Wilson (2003) projected that "information behaviour covers all aspects of human information behaviour, whether active or passive. Information seeking behaviour is the act of actively seeking information in order to answer a specific query. Information searching behaviour is the behaviour which stems from the searcher interacting with the system in question. This system could be a technological one, such as the searcher interacting with a search engine, or a manual one, such as the searcher selecting which book is most pertinent to their query. Information use behaviour pertains to the searcher adopting the knowledge they sought" (Quoted in Gaba and Singh, 2015).

The knowledge of information needs and information-seeking behavior of different users of the library is quite essential as it helps in the planning, implementation, and operation of library and information system and services. Here, in this study an attempt has been made to investigate the information needs, seeking behavior and satisfaction of users of RaiSahabBhanwar Singh College, Nasarullahganj, Sehore (MP) in this digital era and other related factors.

3. Literature Review

Research must continue to add to the body of knowledge and solve the problems of humanity on the long term basis. The knowledge gathered in the past should be consolidated to keep on records, for future use. It is like consulting the maps of explorers for future direction. An attempt has been made to review the literature published on the information seeking behavior of the different kinds of users. Few related studies have been observed before conducting this study. Researcher has made an effort to access the existing literature on the research topic and its related concepts through literature search. Researcher has also consulted several primary and secondary sources of information.

Ramesha and Yaranal (2015) conducted a survey on information need and information seeking behavior of library users of NRN Memorial National Law Library of NLSIU, Bangalore and revealed that 81% of the respondents use the library for "mix of several purposes". 83% of users responded that they will use the library to read newspapers and competitive exam related magazines. The researchers have also clear indication of invisible college and user dependence is more on informal modes of communication, than the formal. The researchers also advised that to promote the use of books and other information resources it must be have a functional building with provision for pleasant, natural and electrical light, soothing interior, good-looking furniture, comfortable chairs and other such facilities. It is further suggested that library staff should be attentive, cheerful, and careful for books and readers and should also render helping hand to the readers. **Sinha and Das (2015)** found that majority of the respondents (57.21%) seeks information pertaining to employment and job opportunities and 67.44% rural population get their sufficient information from television. Most of the rural people of Barak Valley lack basic knowledge on how to use the information resources and services for solving their various purposes. The study equally discovered lack of awareness about the rural / public library by the rural people of Barak Valley. Although public library, television, radio, newspapers, community information centres, KrishiBigyanKendras were identified as the major sources used by respondents for acquiring information. Lack of awareness by the rural library about the extension services like seminar /workshop programs, lecture programs and arrange classes for illiterate under national literacy mission were seen as one of the major constraint of meeting their information needs. The researchers give some suggestions like there is a need to evaluate various information sources to get their needed information by the rural people easily and without any discrimination.

Bansode&Nargide (2014) revealed that majority of the respondents are well aware and have a lot of knowledge about electronic information resources and most of the time faculty members use both i.e. subscribed as well as open source electronic information resources for locating the desired information. Majority of the respondents prefer to locate for full text as well as abstract form of information. Research, lecture preparations and publications are found to be the core purposes of accessing electronic information resources. The researchers also give some suggestions to overcome the hindrances in accessing the electronic information resources among the faculty members that the awareness programs, hands on training sessions, product demos, orientation on web searching and retrieval skills should be organized at regular intervals. **BhanuPartap (2014)** found that 60.54% respondents come to the library for using journals from CeRA database. Majority (51.70%) of the respondents reviewed articles from various information resources available in print as well as in electronic form for their desired information. Internet has been preferred by more than 70% of the respondents as their channel of information. About 44.21% respondents were satisfied with the adequacy of the e-journals (CeRA journals/database) services provided by the library while 38.09% respondents were quite satisfied with the proper collection of e-theses and finally concluded that majority of the agricultural scientists were satisfied with overall facilities and services provided by the Nehru Library of CCSHAU, Hisar.

Mahapatra (2014) conducted a study on information needs and seeking behaviour of physicians of Hi-Tech Medical College and Hospital, Bhubaneswar and found that physicians at the level of Junior Residents and Senior Residents are more using libraries compared to their senior counterparts. It is also found that discussions with the professional colleagues and participation in conference and seminar provide a lot of inspiration to the physicians so that they are involved in activities that generate information. The majority of physicians need information almost daily so as to improve their professionalism through the use of library than any other means, which is certainly a healthy sign. The study inferred that physicians under survey are not in good habit of using several information services cultivating current approach to information except borrowing books and photocopying materials of their interest for home-reading.

4. The Profile of RSBS College Library

The RaiSahabBhanwar Singh College, Nasarullahganj (MP) affiliated with Barkatullah University, Bhopal was established in the year 2001 in the memory of Shree Bhanwar Singh JiSothiya. Library of RaiSahabBhanwar Singh College is very good and rich in collection and services which caters to the information requirement of the students and faculty members of the Institution. The current state of the library is as under:

Table 1: Status of RSBS College Library

Resources	**Collection**
Books	17000
Journals	32
News papers	6
Magazines	10
Encyclopedias	27
Membership of the Library	
Teachers	65
Non-Teachers	22
Students	All the students have to take the compulsory membership of the library

Source: Survey

5. Objectives of the Study

The main objective of the study is to find out the information needs, seeking behavior and satisfaction of library users of RaiSahabBhanwar Singh College, Nasarullahganj, Sehore (MP). The present study has following aims and objectives as enunciated below:

- To ascertain information needs, seeking behavior of the UG and PG Students;
- To determine how frequently the students make use of different categories of information sources and services in the library;
- To know the purpose of usage of different categories of information sources and services in the library;

- To identify the type of information resources used by the students in the library;
- To know about the medium of seeking information;
- To find out the adequacy level of print and electronic collection in the library;
- To examine the information seeking strategy by the students;
- To assess the level of satisfaction in using the collection and services by the students and to suggest suitable solutions;
- To find out the problems in getting information faced by these while accessing the sources; and
- To offer suggestions and recommendations pertaining to the study.

6. Scope and Limitation of the Study

The present study is a form of user study designed to bring within its confines only UG and PG students studying in RaiSahabBhanwar Singh College, Nasarullahganj, Sehore (MP), their information requirements, information-seeking behavior, theirreading habits and the existing library facilities available. Thus, the scope of the study is limited to the UG and PG students only studying in different courses like B.A., B.Sc., B.Com., M.Sc., M.Com.

7. Methodology

Research method is the foundation of any research project carried out for a systematic study of the problem and hence for this study, the following methodology has been adopted. The present study was conducted using survey method. A structured questionnaire was designed for the purpose of data collection and the copies of the same were distributed personally on randomly basis to the UG and PG students of RaiSahabBhanwar Singh College, Nasarullahganj, Sehore (MP) in the months of October-November, 2015. Total 200 questionnaires were distributed out of which169 questionnaires were received back (84.50 %). On the basis of filled up questionnaire the data has been analyzed and tabulated. All the results have been presented in the form of tables. For the data analysis percentage technique has been adopted.

8. Data Analysis and Interpretation

Table 2: Distribution of Respondents

Respondents	Questionnaire Distributed		Questionnaire Received		Response (%)
	Male	Female	Male	Female	
UG Students	85	45	71	38	109 (54.50%)
PG Students	40	30	34	26	60 (30%)
Total	200	169	84.50%		

Table 2 shows the population of the survey and comprises with UG and PG students. It is clear from the above table that total 200 questionnaires were distributed to the UG and PG students on randomly basis and 169 questionnaires were received back. Out of 169 respondents, 109 were UG students and 60 were PG students. Gender wise distribution of the respondents is also shown in the above table. Overall response rate is 84.50%.

Table 3: Frequency of Visit the Library

Frequency	Respondents	Response (%)
Daily	33	19.53
Two to three times a week	30	17.75
Once in a week	27	15.98
Once in fortnight	45	26.63
Once in month	20	11.83
Occasionally	14	8.30
Total	169	100

Table 3 highlights that majority of the respondents, i.e. 26.63% were using the library once in a fortnight followed by 19.53% daily, 17.75% two to three times a week, and 15.98% respondents were using the library once in a week respectively. Few respondents (11.83%) visit the library once in a month and 8.30% respondents using the library occasionally or when they needed.

Table 4: Purpose of Information Seeking

Purposes	Respondents (n-169)	Response (%)
General Awareness	139	82.24
Keeping up-to-date	30	15
Study Material	162	95.85
Preparing Class notes	140	82.84
Preparing assignments	74	43.78
Practicing in declamation contest	23	13.60
Preparing projects and PPTs	88	52.07
Seminar and conference	42	24.85

Table 4 makes it quite clear that a big majority of the respondents, i.e. 95.85% were using the library to consult or borrow the study material related to their course curriculum whereas 82% respondent's main purpose for using the library is general awareness or to prepare their class notes. More than 52% respondents using the library for preparing projects / project reports or MS-Power Point Presentations followed by preparing assignments (43.78%), seminar & conference (24.85%), keep update themselves (15%), and to prepare themselves for participating in declamation contest (13.60%) respectively.

Table 5: Awareness of Electronic Information Resources

Awareness	Respondents	Response (%)
Aware	126	74.56
Not Aware	38	22.48
No Response	5	2.96
Total	169	100

Table 5 reveals the awareness of electronic information resources among the students. It is found that majority of the respondents, i.e. 74.56% responded that they are much aware about the electronic information resources and 22.48% respondents were shown unawareness about the electronic information resources.

Table 6: Type of Information Sources Used

Information sources	Respondents	Response (%)
Books	169	100
Journals	79	46.74
Magazines	87	51.48
News papers	90	53.25
Encyclopedias	29	17.16
Reference Sources	60	35.50
Open Online (e-resources)	42	24.85
Internet	150	88.76

Table 6 describes the various types of information sources use by the respondents to seek their desired information. It is clear from the above table that cent percent respondents were using and consulting the books. Internet is using by more than 88% respondents for getting various types of information desired by them. More than half of the respondents were using newspapers and magazines to get information of their educational or general type of nature followed by journals (46.74%), reference sources (35.50%), open online resources (24.85%) and encyclopedias (17.16%) were using for basic or background information respectively.

Table 7: Preference of Information Channels

Channels of information sources	Respondents	Response (%)
Books	109	64.50
Journals	41	24.26
Encyclopedias	19	11.24
Internet	118	69.83
Class Teachers	73	43.20
Fellow Students	66	39.05
Class Room Teaching	103	60.95
Library Staff	30	17.75

Table 7 shows the various information channels preferred by the respondents to get their desired information. It is found that nearly 70% of the respondents were given the preference to the Internet for getting their desired information and nearly 65% preferred books as their main information channel. Nearly 61% of the respondents said that they were getting their desired information from their class room teaching followed by class teachers (43.20%), fellow students (39.05%), journals (24.26%) and encyclopedias (11.24%) respectively.

Table 8: Problems Faced while Seeking Information

Problems	Respondents	Response (%)
Library Timings	8	52.66
Incomplete information material	5	32.54
Unaware of updated information technology	7	41.42
Lack of Cooperation of Library Staff	1	7.10
Lack of knowledge about library services	4	27.21
Lack of knowledge about library resources	6	37.27
Resources not available in sufficient numbers	6	36.10
Lack of Time	3	18.34

Table 8 reveals the problems faced by the respondents while seeking or searching to their desired information. It is clear from the above table that majority of the respondents (52.66%) were not happy with the timings of the library and want to keep open for more hours whereas 41.42% of the respondents faces the problem of unawareness of updated information technology. 34.27% said they have lack of proper knowledge about various information resources available in the library followed by resources are not available in sufficient numbers as desired (36.10%), incomplete information material (32.54%), lack of knowledge about library services provided (27.21%) respectively. Few respondents, i.e. 18.34% said that they have little bit of time to visit the library and make use of information resources properly because of schedule of regular classes. Least number of respondents (7.10%) responded that they are facing the problem while searching desired information because of lack of cooperation of library staff.

Table 9: Satisfaction Level towards Adequacy of Library Collection

Library Collection	Very much Adequate	Adequate	Fairly Adequate	Inadequate	Very much Inadequate
Books	28 (16.56%)	74 (43.79%)	42 (24.85%)	19 (11.25%)	06 (3.55%)
Journals	10 (5.92%)	38 (22.48%)	76 (44.98%)	31 (18.34%)	14 (8.28%)
News papers & magazines	19 (11.25%)	74 (43.79%)	40 (23.66%)	25 (14.80%)	11 (6.50%)
Reference Sources	16 (9.47%)	61 (36.10%)	58 (34.31%)	21 (12.43%)	13 (7.69%)
E-resources	-	08 (4.73%)	13 (7.69%)	99 (58.58%)	49 (29%)

Table 9 highlights the satisfaction levels of the respondents towards adequacy of library collection. It is observed that most of the respondents (more than 60%) were quite satisfied with the adequacy of books in the library, while nearly 45% of the respondents were shown their satisfaction with the adequate collection of journals. However, more than 25% were unsatisfied towards the journal collection. More than half of the respondents (55.04%) were happy with the collection of newspapers and magazines in the college library while 23.66% were moderately satisfied. Nearly 46% of the respondents were satisfied with the adequacy of collection of reference sources. Interestingly, a big majority of the respondents (more than 87%) were unsatisfied with the collection of e-resources and suggested that e-resources should be subscribed / purchased due to digital era and easy to search and use.

Table 10: Satisfaction Level towards Adequacy of ICT Based Resources and Facilities

ICT Infrastructure	**Very much adequate**	**Adequate**	**Fairly Adequate**	**Inadequate**	**Very much inadequate**
Internet	-	-	-	-	87
E-books	-	-	-	-	93
E-Journals	-	-	-	-	-
CD_ROM database	-	-	-	-	-
OPAC	-	-	-	-	-
Printout	-	-	-	-	-

Respondents were also asked about to show their satisfaction level about the adequacy of ICT based resources and facilities provided by the library. Table 10 describes

the much unsatisfaction level among the respondents towards the ICT based resources and facilities. None of the respondents were satisfied with the adequacy of ICT based resources and facilities.

Table 11: Overall Satisfaction with Library Services, Resources and Helpfulness of Library Staff

Response	UG Students (n=109)	PG Students (n=60)	Total response (n=169)
Fully satisfied	40 (36.70%)	16 (26.67%)	56 (33.14%)
Partially Satisfied	52 (47.70%)	35 58.33%)	87 (51.48%)
Dissatisfied	17 (15.60%)	09 (15%)	26 (15.38%)

Table 11 shows the overall satisfaction level with the library services, resources and helpfulness of library staff among the respondents. The researchers found that more than half of the respondents (51.48%) were partially satisfied and 33.14% were fully satisfied with the library services, information resources and helpfulness of library staff. However, 15.38% of the respondents were shown their dissatisfaction towards the same.

9. Major Findings

From the data analysis the following major findings may be drawn:

- 26.63% respondents use the library once in a fortnight and only 19.53% of the respondents use the library daily.
- Majority of the respondents (95.85%) use the library to consult or borrow the study material and nearly 82% respondents use the library for general awareness or to prepare class notes.
- Nearly 75% respondents are aware about the e-resources.
- All the respondents (100%) use and consult the books while 88% respondents use the Internet for getting their desired information.
- Nearly 61% respondents get their desired information from their class room teaching.
- Majority of the respondents (52.66%) are unsatisfied with the timings of the library.
- 41.42% respondents are unaware about updated information technology and its applications.
- More than 60% respondents are quite satisfied with the adequacy of books in the library, while nearly 45% respondents are satisfied with the adequate collection of journals.
- No respondents are satisfied with the ICT based infrastructure, resources and services.
- 51.48% respondents are partially satisfied and 33.14% are fully satisfied with the library services, information resources and helpfulness of library staff.

10. Suggestions

On the basis of the findings of the study following suggestions are put forth:

- There should be proper collection development policy followed by the college/library management.
- Library should upgrade ICT infrastructure, resources and services regularly.
- There should be regular training / orientation programmes on information search strategy, how to use reference resources and other resources for the students for increased use of e-resources.
- Electronic information resources must be purchased / subscribed regularly.
- Library should organize information literacy programmes for the users.
- Library staff must be well-trained in handling modern gadgets of information technology so as to guide and assist the students as well as teachers in using e-resources and other information resources whenever the need arises.
- Proper management training should be organized for library staff, so that they can improve their helpfulness and cooperation and less heavy working stress in this challenging digital era.

11. Conclusion

It is generally assumed that the library users in unpredictably tends to possess favorable towards information and makes an attempt to keep abreast of the most up-to-date information (Ramesha and Yaranal, 2015). The study has brought out some major facts and figures in terms of information needs, seeking behavior, utilization library resources and services offered by the library of RaiSahabBhanwar Singh College, Nasarullahganj, Sehore (MP). Information needs are diverse and they rely heavily on books and other primary source of information, so the lack of availability of required material in libraries is a major problem in information seeking. It is quite encouraging that majority of the respondents have widely used the information resources and services provided by the library. It was observed that most of the respondents are in the habit or state of using electronic resources and they are keen in using ICT tools and service for their educational and personnel information requirement. Library and information professionals can analyze the findings of the study and design, develop, and introduce new library and information services for them. Library and information professionals should conduct further studies on user information needs, seeking behavior and user satisfaction to provide more suitable resources and services to different users groups in this digital era.

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Users' perspective over the use of Public Domain Legal Resources: *a Study of users of select Law Libraries in Delhi*

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Abstract: The term Public Domain was initially used for the land on which nobody had proprietary rights in England. The term was further adopted in Copyright Laws by various countries. The paper discusses a number of public domain legal resources viz. parliamentary and legislative information, case laws, legislation, law reform reports, journals and scholarships and treaties. The paper is based on a problem statement that the patrons involving in legal education, research and practice has little bit knowledge about the availability of public domain resources which can be used free of cost with the help of a computer system and internet connect. The paper is based on a survey done over user population from nine law libraries of Delhi. Graphical and statistical presentations of response with findings have been inculcated in the paper.

Keywords: Public domain resources, User's perspectives, Law libraries, Delhi

1. Introduction

With the advent of information and communication technology, the flow of information has become faster even beyond boundaries across the world. World Wide Web has revolutionized moving information in variety of formats with a simple click of mouse. A number of initiatives accessing research scholarships worldwide have been introduced since 1990s for removing financial hurdles among research communities. Being funded by public funds, most of the government data are now accessible through web portals of respected departments of the governments around the world. The paper is designed to find the awareness among law students, law faculty, government officials and law library professionals. The paper gives brief over view on public domain resources, open access, legal education and research and various evaluative criteria of web information resources.

2. Public Domain Resource (PDR)

'Intergovernmental committee on intellectual property and genetic resources, traditional knowledge and folklore' constituted by 'World intellectual property organization' explains the term public domain as intangible objects not protected under any intellectual property laws and is exploitable by anyone without any obligation. The document elaborates the term public domain on number of measurements like intellectual property free material, material available for use by anyone and intelligibility for private ownership, publically available and accessible, accessible but not protected and unprotected but not accessible. 'Bern convention for the protection of literary and artistic

works' (1971) uses the term public domain for differentiates copyrighted and copyright free work. The convention explicates that the principles of the convention would apply only on those intellectual works of member countries which have yet not fallen in the public domain. However the term public domain may be understood with its' widen scope by inclusion of unprotected uses of copyrighted work under fair use or copyright expired work. Litman (1990) argues that there is no importance of copyright laws without public domain and the terms are two sides of a coin. He explicates that the copyrighted work always becomes public domain work after passing litmus test of copyright laws. The term public domain resources has been coined to indicate information resources available on websites and can be referred free of cost. Good examples of universally known public domain resources can be accessed through the following websites.

- **Europeana**: It provides information resources over European culture.
- **Internet Archive**: Supported by the Google, Internet Archive provides a huge collection of public domain work containing films, music and texts.
- **Wikimedia Commons**: It is a good collection of image since 17th century.
- **Flickr the Common**: It provides a good collection of old photos.
- **Wikisource**: It is a good collection of text files searchable in html format.
- **Project Gutenberg**: It is a project digitizing books and monographs not covered under copyright laws or for which copyright laws have been expired.
- **The Public Domain Review**: It is a common gateway to provide search and access of books and other textual material available under public domain.
- **Creative Commons Search Tools**: It is a search engine facilitating results among other public domain websites like Europeana, Internet Archive, Flickr, Google images and others which are using various creative common licenses.

3. Purpose of the Study

The purpose and objective of the study is to evaluate awareness and optimum use of public domain resources. The prime objective of the study is to know about the awareness of use of public domain legal resources by Law Researchers and to know whether the public domain resources are being utilized for research purpose or not.

- **Research Methodology:** The methodology includes statement of the problem used and sample and data collection.
- **Statement of the Problem:** The paper focuses on awareness about availability of public domain resources funded and maintained out of public fund useful for research and educational purposes among researchers. It is derived out to know the constraint factors and reasons for lacking of utilization public domain resources. The following statement is being considered as statement of problem for the study.

"The users of Law Libraries are lacking in optimum utilization of public domain resources in their day to day research activities due to non-awareness and improper guidance."

- **Sample and Data Collection**

The study includes four types of law institutions covering nine institutional libraries viz. Supreme Court Judges Library, Supreme Court of India, New Delhi; Delhi High Court Judges Library, Sher Shah Suri Marg, New Delhi; Parliament of India Library, Parliament of India, New Delhi; Law Commission of India Library, Kasturba Gandhi Marg, New Delhi; National Human Rights Commission Library, Copernicus Marg, New Delhi; Campus Law Center Library, University of Delhi, Delhi; Guru Gobind Singh Indrarastha University, Dwarka Sec-16, New Delhi; Indian Law Institute, Bhagwandas Road, New Delhi and National Law University, Delhi, Dwarka Sec-14, New Delhi engaging legal education and research for collecting responses from variety of researchers including faculty, research scholars (Ph.D. Scholars), post graduate students (LL.M.), undergraduate students (LL.B.), law library professionals, government officials and law clerks/attorneys.

4. Responses from User Population

520 questionnaires were distributed among target audience/ user population. 89.62 per cent questionnaires have been received back. It is a positive response towards research that 100 per cent responses from law faculty and research scholars of law universities in Delhi have been received back. The least but sufficient to support for research i.e. 75 per cent responses have been received from Government Officials/ Law Clerks. In gross 89 per cent responses have been received from students at post graduate and undergraduate level. The data received from all categories have been combined for analyzing responses and trends justifying the research study. (See Table 6.1)

S.n	Designation	Questionnaires Distributed	Questionnaires Collected	Percentage
1.	Government Officials/ Law Clerks	40	30	75%
2.	Law Students (LL.M.)	100	89	89%
3.	Law Students (LL.B./ LL.B.)	300	267	89%
4.	Law Faculty	40	40	100%
5.	Research Scholars	40	40	100%
	Total	**520**	**466**	**89.62%**

- **Users' View about the search of Authoritative Case Laws in Public Domain as Compare to Commercial Databases**

Figure 1 shows a graphical presentation of responses of user population about their views searching authoritative case laws of apex courts of various countries, international courts and India courts as compare to commercial database. Only 26.9 per cent of user population understands that the searching of information in public domain is authoritative as compare to commercial databases. 28 per cent faculty and 32 per cent research associates agree that authoritative text of case laws can be searched through public domain.

Figure 1: User View about Searching Authoritative Case Laws available in PDRs

However 26.3 per cent Government Officials/ Law Clerks give their positive responses supported searching of authoritative text of case law available in public domain. 27.3 per cent user population understands that authentic case laws can be searched among public domain resources. However 30.8 per cent of total population does not understand it feasible searching authenticated case laws from public domain. 12.7 per cent of user population has not submitted their responses.

- **Users' View about the search of Authoritative Legislation in Public Domain as Compare to Commercial Databases**

User population was asked about their views for searching of authoritative text of legislation found in public domain on the basis of web links provided in section four of the questionnaire. Figure 2 shows bars presenting users' view where red indicates about users' consent in favour of authoritative text of legislation can be searched through public domain information. 45.8 per cent of the user population counts it feasible searching authoritative legislation available in public domain. 15.4 per cent user population responds that searching of legislation in public domain is not authoritative. However, 17.7 per cent user population is not aware about the searching of authoritative text of legislation available under public domain. 21.2 per cent of the user population has not turned up for the question.

Figure 2: User View about Searching Authoritative Legislation available in PDRs

On the basis of individual population, 45.5 per cent students, 36 per cent faculty, 48 per cent research scholars and 48.7 per cent Government Officials/ Law Clerks give their supports searching authoritative text of legislation available in public domain.

- **Users' View about the search of Authoritative Legal Articles in Public Domain as Compare to Commercial Databases**

User population was asked about their views about the searching of authoritative legal articles available in public domain. 38.1 per cent of the user population gives their consent

that the searching of public domain resources provides authoritative legal articles and feels it authentic to refer it for their legal education and research. 26.9 per cent user population is not satisfied searching legal articles available under public domain. 19.2 per cent user population is not aware about the issue, although 15.8 per cent of the user population has not responded for the question.

Figure 3: User View about Searching Authoritative Legal Articles available in PDRs

Figure 3 shows 36.6 per cent students, 36 per cent faculty, 32 per cent research scholars and 43.4 per cent Government Officials/ Law Clerks respond that one can search authoritative text of legal articles available in public domain. 56 per cent research scholars do not agree with searching of authoritative text of legal articles in public domain.

- **Users' View about the search of Authoritative Law Reform Reports in Public Domain as Compare to Commercial Databases**

Law Reform Reports are very important tools for legal research. User population was asked to give their views searching authoritative text of law reform reports available in public domain. Figure 4 shows that 54.6 per cent user population feels convenient to search authoritative text of law reform reports available in public domain. A very few population i.e. 16.9 per cent feels searching of law reform reports available in public domain are not authoritative.

Figure 4: User View about Searching Authoritative Law Reform Reports available in PDRs

52.2 per cent of students, 44 per cent of faculty, 68 per cent of research scholars and 57.9 per cent Government Officials/ Law Clerks opt that the searching of text available of law reform reports are authoritative to use for legal education and research.

- **Users' View about the search of Authoritative Text of Treaties available in Public Domain as Compare to Commercial Databases**

Treaties are agreements based documents between two or more countries under international law. User population was asked about their views for searching of authoritative text of treaties available in public domain. Figure 5 show that 48.5 per cent of user population agrees that the text of treaties available in public domain can be searched for authoritative text and ready to use for legal education and research. 64 per cent research scholars opt about the searching and use of authoritative text of treaties from public domain. 55.3 per cent of Government Officials/ Law Clerks, 44.8 per cent students and 32 per cent of faculty agree about searching of authoritative text of treaties in public domain.

Figure 5: User View about Searching Authoritative Treaties available in PDRs

6. Findings and Observations

The paper retaliate findings based on views of user population about searching authoritative text available in public domain pertaining to law i.e. case laws, legislations, law reform reports, scholarships and treaties.

- Less than one third user population (27.3 per cent) feels that the search of case laws available in public domain provides authoritative text as compare to commercial databases. However majority of user population finds the text not authoritative (30.8 per cent) or they are not aware (29.2 per cent) or not responded for the question (12.7 per cent).
- But majority of user population (45.8 per cent) like to search legislation through public domain resources and understands the text authoritative. However user population (15.4 per cent) does not feel positive searching legislation through public domain resources. On the other side a group of user population is either not aware (17.7 per cent) or not responded (21.2 per cent) on the question of searching authoritative text referring legislation through public domain resources.
- User population (38.1 per cent) too thinks that searching of legal articles available in public domain provides authoritative text. However, less than one third user population (26.9 per cent) figure out that search of legal article in public domain resources are not authoritative. Research scholars (56 per cent) engaging in deep research contemplates that the search of articles in public domain does not produce authoritative text.
- Responses of user population about searching of authoritative text referring law reform reports reckon positive trends. Most of the user population (56.6 per cent) understands that authoritative reports can be searched through public domain resources. Very few user population (16.9 per cent) computes its worthless to search law reports available in public domain.
- Treaties between countries are legislative instrument under international law. Most of the treaties are available in open access environment. Majority of user population (48.5 per cent) quantifies that the search of treaties in public domain produces authoritative text. Only a small section of user population (16.9 per cent) thinks not search public domain of treaties due to non-authoritative nature of text.

7. Conclusion

The study emphasizes that various categories of users of law libraries are very little aware about the existence of public domain resources due to lack of proper e-learning/orientation and absence of user guides. On the other side, users of law libraries also feel that the information available in public domain is less reliable and fragile in nature. It is need of the hour to introduce legislative tools for enhancing standards and quality of public domain resources for better utilization of information available freely.

Web resource evaluation criteria and policy guidelines must be drafted by libraries for providing proper credit to the efforts of institutions and researchers.

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