62nd ILA CONFERENCE

CONFERENCE PROCEEDINGS

International Conference on "Gearing up for the Future: Library Initiatives for Digital India"

Chief Editors

Prof. Ashu Shokeen and Dr. D.V. Singh

Editors

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Dr. Tariq Ashraf,

Dr. O.N. Chaubey,

Dr. Pravin Kr. Choudhary,

Prof. P.G. Tadsad

Organised by

Karnataka State Women's University,
Vijayapura, Karnataka
and
Indian Library Association, Delhi

2017



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Gearing up for the future: Library initiatives for digital India

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Prof. P.G. Tadsad

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FOREWORD

The present team of Indian Library Association after taking over charge on 1st April, 2016 has been putting all its efforts in raising the all-round standards of the Association still further. In the process, the weaker patches of the Association were identified and solution was found out in developing a dynamic portal of ILA (www.ilaindia.net), a gigantic task completed within a period of six months. Some of the important features of the portal include: Online membership, ILA members' 'Database' with the facility of 'Edit Profile'. Online access to up-to-date 'Minutes of Executive and the Council meetings', the Online 'ILA Newsletter' (with a database of back issues). Online access to the 'Journal of Indian Library Association' (JILA) with the facility of free access to life members and subscribers etc.

One of the most important part of the whole exercise was to organize an international conference under the aegis of ILA. While a number of options were being explored, a request came from Prof. P. G. Tadasad, Professor and Chairman, Department of Library and Information Science, Karnataka State Women's University, Vijayapura, Karnataka for the same. The keen interest of Prof. P. G. Tadasad and his team with full support of ILA office bearers has resulted into an overwhelming response from the scholars and library professionals in India and abroad. This is justified by the fact that as many as 120 articles were received for presentation out of which 107 papers were accepted for presentation as well as for conference volume. A thematic representation of the accepted articles is given as under:

- Information Organization, Planning and Resource, User Services & Studies, Best Practices in Libraries 32
- Digital Libraries/Institutional Repositories / Open Repositories Digital Conservation and Preservation 13
- Big-data, Cloud Computing, Internet of Things, Open Access Scholarly publishing 21
- Information Resources, Services, and Search Strategies, Information Retrieval 07
- Digital Information and Communication Technology and its Application, Human Aspects of Technology Applications 12
- LIS Education, Library Profession & Ontology 08
- Social Networks 13

We are all aware of the fact that the advent of Information and Communication Technology has completely changed the shape of the Library, not only in its physical appearance but also in its collection from print and paper media to digital media. As Digital libraries have already evolved, the success of a Digital Library depends upon the computers, communication skills, and knowledge of library professionals in connection with modern technology. In the present scenario, we stand at a stage of transition from the traditional library to a Digital Library, accessible globally. At such a juncture, an International Conference of this nature on a theme like "Gearing up for the Future: Library Initiatives for Digital India" is indeed welcome.

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I am sure, the articles pertaining to the themes have been written thoroughly and will evoke mind blowing response from the audience. I congratulate the organizing secretary and his dedicated team for making all possible efforts for the success of the conference. I am sure that the deliberations held during the conference will prove to be a milestone for library profession in India and elsewhere in the world.

S Husain

(Prof. Shabahat Husain)
President, I.L.A.,

Dated: 26th January, 2017

PREFACE

Libraries are in the challenging time of massive changes having far reaching implications for the library professionals. The entire ecology of library system developed over the years has come under scrutiny and several philosophical cornerstones are under challenge. It would not be an exaggeration to say that the entire library profession is standing at the crossroads and looking for newer directions. In fact, it is the professional development and sustenance battle which is on, as several viable information alternatives have become available to users.

> "The Internet has fundamentally changed the practical and economic realities of distributing scientific knowledge and cultural heritage. For the first time ever, the Internet now offers the chance to constitute a global and interactive representation of human knowledge, including cultural heritage and the guarantee of worldwide access". (Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, 2003)

The competitive advantage which libraries enjoyed over the years is under challenge from giant corporate like Google, which is providing several value added services to the public in general. Libraries as repositories of knowledge and wisdom are no longer enjoying their traditional monopoly. Internet with its 24x7 connectivity is playing havoc and it is widely believed that a large number of users have shifted their loyalty to subject specific portals, in pursuit of their teaching , learning and research. The decreasing footfall in libraries is a matter of deep concern and needs to be deliberated upon in detail.

Libraries need to regain their classical position and transform themselves with matching scale to preserve their domain. They have to find discovery tools parallel to online shopping stores which allow customers an in-depth access and cross referencing in real time .

> "Libraries have a strategic interest in the tools and technologies that facilitate the discovery of and access to the resources for the communities that they serve. These tools have seen steady advancement over recent decades, making great strides in the scope and depth of materials addressed and in providing library users ever more convenient ways to access these materials. The progress seen in the successive generations of technology beginning from online catalogs, to meta search tools, to the current generation of index-based discovery services represents an incredible improvement. Yet many gaps remain relative to the potential of more universal access to the universe of content of interest to libraries and their users". Marshall Breeding, *The Future of Library Resource Discovery*, (Baltimore: NISO, 2015).

62nd Indian Library Association International Conference 2017 on "Gearing up for the future: Library initiatives for digital India" is being organized by the Department of Library and Information Science Karnataka State Women's University, Vijayapura, Karnataka and Indian Library Association, New Delhi. Keeping in view the role of libraries not only to reposition and transform themselves, but also to facilitate and contribute to overall digitalization programme in the context of Digital India programme, the recently launched flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy.

ILA International Conference 2017 intends to explore broad foundation for interaction with information and information management in furtherance of Digital India vision with regard to libraries. ILA International Conference 2017 aims to delve into the issue of Digital Libraries with a focus that supports not only information seeking and discovery but also community interaction and collaboration.

As stated by one observer "the new millennium has sculptured a new image for library and information science profession due to application of information and communication technology (ICT), especially the digital technology. The field that has carved-out some unique techniques and tools for information and knowledge organization and management has also invented new areas of study which are receiving tremendous acceptance in the last one decade are; information commons/library commons, discovery service, research data management, Semantic Web, open access to scholarly inform..on including digital curation and digital humanities."

E-Governance in India was conceptualized with the launching of NICNET in 1987 – the national satellite-based computer network, followed by the launch of the District Information System of the National Informatics Centre (DISNIC) programme to computerize all district offices in the country for which free hardware and software was offered to the State Governments. NICNET was expanded via the State capitals to all district headquarters by 1990. In the subsequent years, increasing computerization, tele-connectivity and internet connectivity has established a large number of e-Governance initiatives, both at the State and Union level.The key e-governance concept, the *National e-Governance Plan (NeGP)* has been formulated by the *Department of Electronics and Information Technology (DEITY)* and *Department of Administrative Reforms and Public Grievances (DARPG)*. The Union Government approved the NeGP, comprising of 27 Mission Mode Projects (MMPs) and 10 components on May 18, 2006.

The NeGP aims at improving delivery of Government services to citizens and businesses with the following vision:

> "Make all Government services accessible to the common man in his locality, through common service delivery outlets and ensure efficiency, transparency & reliability of such services at affordable costs to realize the basic needs of the common man." (Ministry of Electronics and Information Technology. Government of India).

ILA International Conference 2017 proposes to explore libraries role in achieving the Digital India objectives both by providing intellectual and social spaces and also as access points. Further, Libraries can sensitize the user community towards the appropriate use of information through capacity building programmes.

The recent thrust of government on building a cashless society by promoting digital transactions provides yet another opportunity for libraries to train users in building their capacities.

It is a matter of satisfaction that the 62nd conference of ILA has received fair amount of good papers covering vital issues like Information organization• User services• Digital libraries/Institutional repositories/Digital archiving/Open repositories• Big-data• Internet of Things• Cloud computing• Cyber Security/Digital copyright• Information resources, services, and search strategies• Digital Information and Communication Technology and its Application (DICTA)• LIS Education• Social networks• Digital conservation and preservation• Open access scholarly publishing• Ontology's• Information retrieval• Digital licensing• User studies• Best practices in libraries and several other areas of importance.

We are sure that this conference volume will be a useful addition to LIS literature and shall be welcomed by the library fraternity in its pursuit of sustaining excellence amidst aforesaid turbulence and transition.

Place: Delhi

Date: 9th Feb2017

Editors

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A Bibliometric Study of Publication Productivity of Teachers in Science Departments of Kannur University, Kerala

Ginisha V. K & Rashida K. N

Abstract: The paper brings out the result of bibliometric study of publication productivity of teachers in science departments of Kannur University, Kerala, India. The study is conducted with the intention to know the most productive teachers in each campus, subject wise publication productivity, gender wise publication productivity, and to find out authorship pattern and degree of collaboration. The bibliometric techniques were used for analyzing the data. Results show that highest number of publications is published in School of Wood Science And Technology. Mangattuparamba campus is the most productive campus and multi authors are very high in number than single authors. The study reveals that a good number of publications are published by teachers in Science Department of Kannur University. It would help the teachers to assess their publication performance.

Keywords: Bibliometric study, Publication productivity, Teachers, Science Departments, Kannur University.

1. Introduction

Universities have a vital role in the generation of new ideas/information, developing, and accumulating the processed information and transmitting knowledge to the society. Higher education has long been recognized as a major contributing factor to the social, cultural and intellectual life of society by improving the quality of human life. Publication productivity is often considered to measure the prestige of an institution and is associated strongly with an individual faculty member's reputation, visibility and advancement in the academic reward structure, particularly at research institutions and universities. The contribution of the institution and the faculties engages in research are highlighted by the institutional productivity[1]. Bibliometrics is a set of mathematical and statistical tool used to measure quantity and quality of books, articles, and other genera of publications. Bibliometrics has an important role in assessing productivity and performance[2].

In the present study focuses a bibliometric study of publication productivity of teachers in Science departments of Kannur University. Kannur University is unique in the sense that it is a multi-campus university with campuses spread over at various locations under its jurisdiction. The campuses at Kannur, Kasaragod, Mananthavady, Payyannur, Thalassery, Kanhangad and such other places as

are necessary for providing study and research facilities to promote advanced knowledge in Science and Technology and other relevant disciplines. There are 38 departments in Kannur University and Out of 38 departments 16 departments are science[3].

2. Review of Literature

Number of related studies have been conducted and reported , based on bibliometrics , to measure the publication productivity of teachers and research output of professionals. Sufficient literature reviews has been published both in India and abroad.

Adithya Kumari and others have conducted a bibliometric study of World research output on Information Literacy in LIS field. They concluded that among various document types the share of information literacy articles was the most prominent[4]. Aswathy and Gopikuttan studied a bibliometric observation of publication output of University teachers. The result showed that the Degree of Collaboration among the teachers was high among the physics faculties of universities. Another study based on bibliometric analysis was conducted by Nadim and Ahangar for research productivity of Government Medical College Jammu. They concluded that high productive departments were General medicine, pharmacology, surgery, and pathology[5].

Shubhada Nagarkar and others have experimented bibliometric analysis of papers published by the faculty of Life Science Departments of Savitribai Phule Pune University. The result showed that the faculty members were very active in research in areas not only life science but in interdisciplinary areas like biophysics, environmental sciences, and medical sciences[6]. Sivaraman made a study on bibliometric analysis of research productivity of faculty members in the Universities of Tamilnadu. The results showed that the scientific publication output by Universities was with the pace of gradual growth trend during the study period[7]. Vaishali and Borse carried out a bibliometric study of research productivity of faculty members in School of Mathematical Sciences. The study examined that the subjects of School of Mathematical Sciences were dominated by English language[8].

Shubhada Nagarkar investigated a bibliometric analysis of publications of the Chemistry Department, University of Pune. The study examines that faculty members were very active in research and their contributions was well recognized at national and international level[9]. Baskaran carried out a bibliometric study of research productivity of Alagappa University. The major finding is the contributors

of publications and collaborations of research has healthy pattern of progress during the period[10].

Kavitha carried out a bibliometric study of research productivity of health science publications in India. The study found that India ranks 10th position in health science contribution[11]. Vaishali studied a study of bibliometric analysis of research publication of Department of Chemistry. The major finding is the majority of the publications were made with 4 authors[12].

Most of the studies analysed the research productivity of professionals and institutions and authorship patterns. Most of the studies used quantitative methods for measuring the research.

3. Objectives of the study

- To know the publication productivity of teachers in Science Department of Kannur University.
- To find out most productive teachers in each campuses of Kannur University.
- To analyze subject wise publication productivity of teachers in Science Department of Kannur University.
- To identify the gender wise publication productivity of teachers in Science Department of Kannur University.
- To find out the authorship pattern and Degree of Collaboration.

4. Methodology, Scope and Limitations

The required data for the present study was collected from Kannur University websites. Some department's dont provide teacher's profile hence unavailable data was collected through interview method like telephone and email. The Collected data has been analyzed by statistical techniques and presented in tabular as well as in graphical form. In addition, some of the statistical techniques were used for analyzing Collaborative Index (CI), Collaborative Coefficient (CC), Modified Collaborative Coefficient (MCC) and Degree of Collaboration.

This study will be useful for the academic community like teachers, research scholars, and students.It would help the teachers to assess their publication performance.The study was limited to the science department in Kannur University.

More over the time span of the study was limited to current teachers only. The data cannot be classified on the basis of year because some of the publications not mentioned the year of publication in website. The analyzed data is mainly taken from Kannur University websites hence it has certain limits.

5. Data Analysis

Publication productivity of teachers

Table 1- Department wise Publication Productivity of teachers in Science Departments of Kannur University

Campus Name	Department Name	Total Publications	Per cent
Thalassery Campus	School of Life Science, Department of Biotechnology & Microbiology	188	18.70
	School of Health Sciences	26	2.58
	Information Technology Education Centre	1	0.09
Mangattuparamba Campus	School of Information Science &Technology, Department of Information Technology	133	13.23
	Department of Mathematical Sciences	93	9.25
	Department of Statistical Sciences	18	1.79
	School of Behavioral Sciences	18	1.79
	School of Wood Science & Technology	203	20.19
	Department of Environmental Science	16	1.59
Swami Anandatheertha Campus, Payyannur	School of Pure & Applied Physics, Department of Physics	94	9.35
	School of Chemical Sciences, Department of Chemistry	55	5.47
	Department of Geography	35	3.48

Mananthavady Campus	Department of Zoology	48	4.47
Nileswaram Campus	Information Technology Education Centre	2	0.19
	Department of Molecular Biology	75	7.46
Kasargod Campus	Information Technology Education Centre	0	0
Total		1005	100

Table 1 show that the department wise publication of the teachers of Science Departments. It indicates teachers have published 1005 publications in Science Departments. It is found that a good number of publications are published by teachers in Science Departments of Kannur University. The highest number of publications is published in School of Wood Science & Technology 188(18.70 per cent) followed by Department of Biotechnology & Microbiology 133(13.23 per cent). The least number of publications is published in Information Technology Education Centre, Thalassery.

The graphical representation of the Department wise publication productivity of teachers in Science Departments of Kannur University is given in Figure 1.

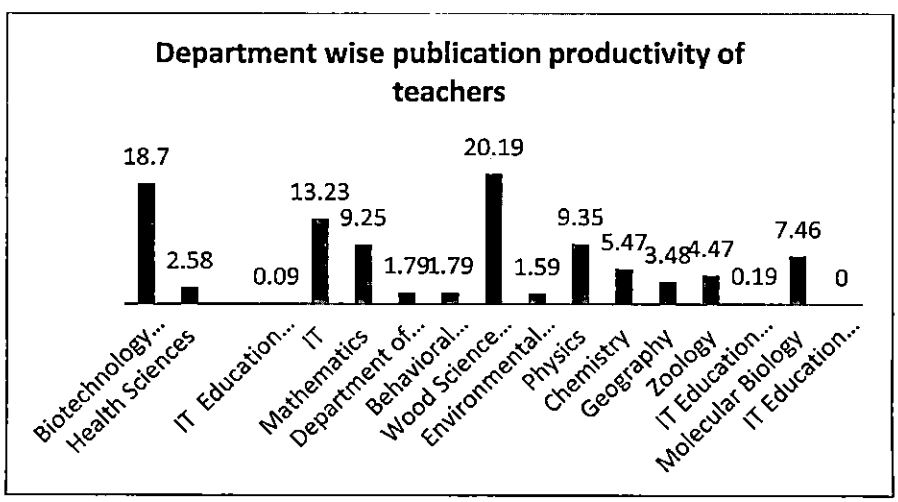


Figure 1 Department wise publication productivity of teachers in Science Departments of Kannur University

Most productive teachers

Table 2 - Most productive teachers in each Campus

Rank	Teacher Name	Department Name	Campus Name	No. of publications	Per cent
1.	Dr.C. Mohanan	School of Wood Science & Technology	Mangattuparamba Campus	196	19.50
2.	Dr.C. Sadasivan	School of Life Science, Department of Biotechnology & Microbiology	Thalassery Campus	122	12.13
3.	Dr.K.P. Santhosh	School of Pure & Applied Physics, Department of Physics	Swami Anandatheertha Campus, Payyannur	62	6.16
4.	Dr. Soorej. M. Basheer	Department of Molecular Biology	Nileswaram Campus	39	3.88
5.	Dr. Prasadan P.K	Department of Zoology	Mananthavady Campus	25	2.48

Table 2 indicate that the most productive 5 teachers in Science Departments of each Campus in Kannur University. It is revealed that Dr. C. Mohanan 122(12.13 per cent) belongs to School of Wood Science & Technology, Mangattuparamba Campus, published high number of publications and Dr. Prasadan P.K 25(2.48 per cent) belongs to Department of Zoology, Mananthavady Campus, published less number of publications on the basis of Campus.

Subject wise publication productivity

Table 3- Subject wise publication productivity of teachers in Science Departments of Kannur University.

Sl. No	Subject	No. of Publications	Per cent
1	Biotechnology & Microbiology	188	18.70
2	Medical Biochemistry	26	2.58
3	Information Technology	136	13.53

4	Mathematical Science	93	9.25
5	Statistical Science	18	1.79
6	Behavioral Science	18	1.79
7	Wood Science & Technology	203	20.19
8	Environmental Science	16	1.59
9	Physics	94	9.35
10	Chemistry	55	5.47
11	Geography	35	3.48
12	Zoology	48	4.77
13	Molecular Biology	75	7.46
Total		1005	100

While analyzing the Table 3, it is seen that subject wise publications of the teachers of Science Departments of Kannur University. It depicts that there are 13 science subjects. Among the total 1005 publications, Wood Science & Technology 203(20.19 per cent) published largest number followed by Biotechnology & Microbiology 188(18.70 per cent) and Environmental Science 16(1.59 per cent) published lowest number.

Gender wise publication productivity of teachers in Science Departments of Kannur University

Table 4- Gender wise publication productivity of teachers in Science Departments of Kannur University.

Sl.No	Gender	No. of teachers	No. of publications	Per cent
1	Male	34	922	91.74
2	Female	11	83	8.25
Total		45	1005	100

Table 4 clearly shows that gender wise publication productivity of teachers in Science Department of Kannur University. It analysed that 34 male teachers and 11 female teachers have published in Science Department of Kannur University. The male teachers published 922 (91.74 per cent) publications and female teachers published 83(8.25 per cent) publications. It is revealed that male teachers mostly published than female teachers in Science Department of Kannur University.

Forms of publication published by teachers

Table 5- Forms of publication published by teachers in Science Departments of Kannur University.

Sl. No.	Type of Document	No. of publications	Per cent
1	Research Publication	570	56.71
2	Papers in International& National conference, seminar &symposium	205	20.39
3	Publication in Peer reviewed Journal	67	6.66
4	Books	28	2.78
5	Chapter in Book	61	6.06
6	Book edited	8	0.79
7	Proceedings edited	2	0.19
8	Publication in Database	35	3.48
9	Patents	9	0.89
10	Information Bulletin	10	0.99
11	Manuscript	1	0.09
12	Project Report	2	0.19
13	Collaborative works	7	0.69
Total		1005	100

Table 5 clearly shows that forms of publication published by teachers in Science Department of Kannur University. It lists 13 types of publications published by teachers. It is revealed that the research publications 570(56.71 per cent) are the prominently found publication among teachers when compared to other forms of publication, and followed by International, & National conference, seminar &symposium 67(6.66 per cent). Moreover, the task of research activities should be more emphasized in a way that teachers consider research as a major part of their professional workflow. Manuscript, Project Report and Proceedings edited are very few in number.

Authorship Pattern

The number of authors contributing scholarly publications in team of authorship pattern is an instructing part of any bibliometric study. A count of number of authors contributing to articles offers some indication to the degree of collaboration between authors. One of the early measures of degree of collaboration is Collaborative Index (CI).Collaborative Coefficient (CC) is a measure of collaboration in research that reflects both the mean number of authors per paper as well as the proportion of multi-authored papers. The CC can be explained

as a single authored paper gets 1 credit; two-authored paper, each received half credit. Collaborative Coefficient is number between 0 and 1 whatever the number is closer to 1 indicates more collaboration between authors. The derivation of the new measure is Modified Collaborative Coefficient (MCC); it is same as that of CC[13].

Table 6 - Authorship Pattern

Subject	Single Authored	Two Authored	More than Two Authors	Total Publication	Total Multi Authored Publication	Collaborative Index	Collaborative Coefficient	Modified Collaborative Coefficient
Biotechnology & Microbiology	5	34	149	188	183	2.76	0.62	0.62
Medical Biochemistry	10	-	16	26	16	2:23	0.42	0.43
Information Technology	19	68	49	136	117	2.22	0.5	0.50
Mathematical Science	93	-	-	93	-	1	0	0
Statistical Science	1	15	2	18	17	2.05	0.5	0.52
Behavioral Science	15	3	-	18	3	1.16	0.09	0.09
Wood Science & Technology	81	59	63	203	122	1.91	0.36	0.36
Environmental Science	4	4	8	16	12	2.25	0.46	0.49
Physics	11	33	50	94	83	2.41	0.54	0.54
Chemistry	4	15	36	55	51	2.58	0.58	0.59
Geography	10	14	11	35	25	2.02	0.41	0.42
Zoology	6	27	15	48	42	2.18	0.49	0.5
Molecular Biology	7	22	46	75	68	2.52	0.56	0.56
Total 266		294	445	1005	739	2.09 Mean	0.42 Mean	0.43 Mean

Table 6 shows the authorship pattern in science subjects and its collaborative index, Collaborative Index and Modified Collaborative Coefficient. It found that multi authors are very high in number than single authors. The highest value of Collaborative Index (2.76), Collaborative Index (0.62), and Modified Collaborative

Coefficient (0.62) are in Biotechnology & Microbiology followed by Chemistry. It indicate that the increase in multi authorship. In Mathematical Science there is no Collaborative Coefficient and Modified Collaborative Coefficient and the Collaborative Index value (1) is low in number because it includes only single authorship and the lowest value of Collaborative Coefficient are (0.09) and Modified Collaborative Coefficient (0.09) in Behavioral Science. The Mean value of Collaborative Index is (2.09), Collaborative Coefficient is (0.42), and Modified Collaborative Coefficient is (0.43).

Authorship pattern reveals a remarkable difference between the number of single author and multiple authors. The team publication of the teachers in Science Departments in Kannur University in turn provides joint authorship which results in high collaboration. The value of Collaborative Index, Collaborative Coefficient and Modified Collaborative Coefficient are varies from subject to subject.

The graphical representation of the Authorship Pattern is given in Figure 2.

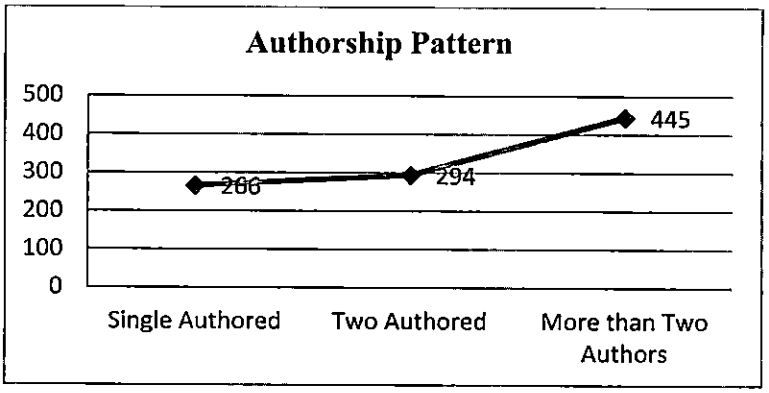


Figure 2 Authorship Pattern

Degree of Collaboration

Various methods have been proposed to calculate the degree of collaboration. Here in this study the formula proposed by Subrahmanyam (1983) has been used. The degree of collaboration C=Nm/ Nm+ Ns. Where, C is Degree of Collaboration in a discipline, Nm is Number of multi authored papers in the discipline, Ns is Number of single papers in the discipline[14].

Table 7-Degree of Collaboration

Subject	Single Author (Ns)	Multiple Authors (Nm)	Ns+ Nm	Degree of Collaboration
Biotechnology & Microbiology	5	183	188	0.97
Medical Biochemistry	10	16	26	0.61
Information Technology	19	117	136	0.86
Mathematical Science	93		93	0
Statistical Science	1	17	18	0.94
Behavioral Science	15	3	18	0.16
Wood Science & Technology	81	122	203	0.60
Environmental Science	4	12	16	0.88
Physics	11	83	94	0.92
Chemistry	4	51	55	0.71
Geography	10	25	35	0.75
Zoology	6	42	48	0.87
Molecular Biology	7	68	75	0.90
Total	266	739	1005	0.70 (Mean)

Table 7 represents the subject wise number of single author and multi-authored publications and their degree of collaboration. The degree of collaboration in Biotechnology & Microbiology (0.97) is highest followed by Statistical Science (0.94) and the lowest in Behavioral Science (0.16). In Mathematical Science (0) there is only single authorship and it has no Degree of Collaboration. It found that multi authorship publications are higher and predominant on single authorship.

6. Conclusions

This study was conducted mainly to identify the publication productivity of teachers in Science departments of Kannur University. It is found that a good number of publications are published by teachers in Science Departments of Kannur University. The highest number of publications is published in School of Wood Science & Technology and Mangattuparamba Campus is the most productive campus. It is revealed that the research publications are the most prominently found publication among teachers. The task of research activities should be more emphasized in a way that teachers consider research as a major part of

their professional workflow. Authorship pattern reveals that multi authors are prominent than single authors in Science Departments of Kannur University. The team publication of the teachers in turn provides joint authorship which results in high collaboration.

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An Analysis of Doaj: Contribution in the Field of Chemistry

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Abstract: Directory of Open Access Journals (DOAJ) is the major contributor in the open access movement. It has access more than 9.382 journals in various disciplines and 184 journals in the subject of chemistry. The study throws light on subject coverage, year wise growth, country wise distribution, leading publisher, and language wise distribution the open access journal in the DOAJ.

Keywords: DOAJ, Open Access, Chemistry, Organic Chemistry, Bio-Chemistry, Analytical Chemistry.

1. Introduction

Scholarly communication has undergone a remarkable change over the last couple of decades primarily due to the exponential growth of e-publications which in turn has given birth to the innumerable open access journals. Notably, the open access has picked up the momentum during last decade and is presently acknowledged widely by the scholars' world over. It enhances the users' accessibility to make the free use of content/literature available online regardless of financial, copyright and technological barriers and is helpful to expedite their research efforts. The freely accessible literature now-a-days attracts a large number of users to make the maximum utilization of the available online literature. However, the accessibility to relevant and current literature in quality journals has been a major setback for the scholars and students of developing nations because of their higher subscription rates.

Directory of Open Access Journals (DOAJ) is a service that provides access to quality controlled Open Access Journals. The aims of DOAJ is to cover all open access scientific and scholarly journals that use an appropriate quality control system, and it will not be limited to particular languages or subject areas. The aim of the Directory is to increase the visibility and ease of use of open access scientific and scholarly journals thereby promoting their increased usage and impact originally. There are now 9.382 journals in the Directory. Currently, 6.539 journals are searchable at article level. As of today 2,354,275 articles are included in the DOAJ service.

2. Review of Literature

Bansal & Singh (2013) article reveals that the open access has reformed the information accessibility and utilization. It benefits the interested persons by providing visibility to the authors and information without any charges to those who need information and knowledge. Directory of Open Access Journals (DOAJ) is the significant contribution to the open access movement. It facilitates access to more than 7700 journals in various subjects including 106 journals in the subject of Animal Sciences. Animal Sciences is an important subject related to the health care of livestock.

Chauhan (2012) study identifies to evaluate open access e-journals in LIS available on Directory of Open Access Journals (DOAJ). The DOAJ provides access to quality controlled Open access journals. DOAJ is an effective source of information for the present day. There is no alternative and substitute to its abundance, utility, and value. This study is an effort to guide students, researchers, scholars about free, full-text, quality controlled scientific and scholarly journals in Library and information science available on DOAJ.

Goyal, Gupta & Kumar (2014) outcome of the present study bring to light that DOAJ promotes access to 86 open access journals in the subject of Physics. English language is most famous in international scenario as 87.20% of the journals are published in English. United Sates dictate other countries in terms of number of journals contributed. With the application of foremost information and communication technologies the open access development is getting more and more intent.

Choudhary & Khode (2010) identified 114 open access journals in computer science that are a part of DOAJ. The authors revealed that 21% of the journals were published from USA while as only two journals were India's contribution in this direction.

Sathyanarayana (2008) highlights in his paper that Open Access Initiative (OAI), its formal origin at the Budapest meeting was organised by the Open Society Institute, and its aims to make published scholarly content freely available on the Web with intent that the Web would make it easy to access. Parallel to OAI, it addresses the issue of bibliographic aggregation. It also discusses the J-Gate and Open J-Gate open access databases and their salient features.

3. Objectives of the Study

Although the core objective of present study was to investigate the contribution of OA journals in Chemistry listed in the Directory of Open Access Journals (DOAJ). However, the following objectives were given due consideration during the course of study to:

- Explore the subject coverage of open access journals in chemistry.
- Examine the year wise growth of open access chemistry journals.
- Ascertain the country wise distribution of journals.
- Identify the leading publishers of open access journals in DOAJ.
- Access language-wise distribution of OA journals.
- Find out the publishing patterns of OA journals.
- Trace out the Indian contribution to open access journals.

4. Methodology

In order to have an in-depth study, the investigators found survey method suitable to analyze the growth and status of open access chemistry journals. To fulfill the objectives laid down above, the data was collected from online directory of open access journals i.e. DOAJ. On the subject of chemistry has listed 184 journals across 37 countries. The data were extracted/ imported from the website in excel format and analysis was carried out on the basis of different parameters viz. subject coverage, year, country of origin, publisher, language, format and Indian contribution to OA journals.

5. Results and Discussions

To assess the contribution of open access journals in Chemistry appeared in DOAJ, The parameters such as Subject coverage, Year wise growth of Journals, Country

wise distribution, Publisher wise distribution, Language wise distribution, etc. have been discussed one by one in detail. Each of the broad categories for the better understanding and analysis of the results have been further divided into sub-categories based on the collected data, and several findings and discussions discussed below have been drawn.

6. Subject Coverage

The Subject-wise distribution of journals shown in table-1 have been categorized into different sub-categories viz. general chemistry, organic chemistry, bio chemistry, analytical chemistry, physical & theoretical chemistry, and inorganic chemistry. Of these sub-categories, Organic Chemistry contributes majority that is 57 (30.97%) to the DOAJ while General chemistry contributes 55 (29.89%) journals. On the other hand, bio chemistry has got 46 (25%) journals while analytical chemistry possesses 15 journals. While physical & theoretical chemistry has got 7 journals. On the other hand, inorganic chemistry has got 4 (2.2%) journals.

Table: 1 subject coverage of chemistry journals

Subject	No. of Journals	Percentage
General chemistry	55	29.89%
Organic chemistry	57	30.98%
Bio chemistry	46	25.00%
Analytical chemistry	15	8.15%
Physical &Theoretical chemistry	7	3.80%
Inorganic chemistry	4	2.17%
Total	184	100%

7. Growth of Journals

It is found from the table 2 that, year wise growth of the journals in the DOAJ, maximum 34 (18.47%) of the Journals added in 2013, as 27 (14.67%) journals added in the year of 2011. In 2010 and 2008 years 22 (11.95%) and 19 (10.32%) journals were added respectively. In the year 2004, 2005, 2006, 2007, 2009, 2012, and 2015, there were 9, 10, 3, 10, 14, 17, and 1 journals added accordingly. It may be noted in the year of 2014 no single journals were added.

Table-2 Growth of Journals

Year	No. of Journals (Year-wise)	Percentage
2002	3	1.63%
2003	15	8.15%
2004	9	4.89%
2005	10	5.43%
2006	3	1.63%
2007	10	5.43%
2008	19	10.33%
2009	14	7.61%
2010	22	11.96%
2011	27	14.67%
2012	17	9.24%
2013	34	18.48%
2015	1	0.54%
Total	**184**	**100%**

8. Country-Wise Journals

The country-wise distribution of open access journals, 37 countries around the world are contributing their chemistry journals in DOAJ. The leading countries in Open Access publishing are India with 26 (14.13%) contribution followed by Egypt with 26 (14.13%) and United States with 22 (11.95%) contribution. On the other hand, United Kingdom is producing 15 (8.15%) while as Switzerland and Germany share the equal contribution i.e. 11 (5.97%) journals. And Brazil is producing 6 (3.26) journals and Turkey with 5 (2.71%) contribution. South Korea, Serbia, New Zealand and Japan are next in place with 4 (2.17%) journals each. This is followed by the countries like Ukraine, Romania, Poland, Nigeria, Islamic Republic of Iran, and Croatia contribute 3 (1.63%) journals each. The countries such as Russian federation, Pakistan, Mexico, Indonesia, Czech Republic, Canada, Argentina which contribute a nominal 2 (1.08%) journals in chemistry field to DOAJ. A very minute contribution of 1 journal each comes from countries like Venezuela, Bolivarian Republic of, Slovenia, Peru, Netherland, Morocco, Macedonia the former Yugoslavia Republic, Italy, Hungary, Greece, Ethiopia, Colombia, China, Chile, Bulgaria.

Table-3 Country Wide Distribution of journals

Rank	Country	Frequency	Percentage
1	India	26	14.13%
2	Egypt	26	14.13%
3	United States	22	11.96%
4	United Kingdom	15	8.15%
5	Switzerland	11	5.98%
6	Germany	11	5.98%
7	Brazil	6	3.26%
8	Turkey	5	2.72%
9	South Korea	4	2.17%
10	Serbia	4	2.17%
11	New Zealand	4	2.17%
12	Japan	4	2.17%
13	Ukraine	3	1.63%
14	Romania	3	1.63%
15	Poland	3	1.63%
16	Nigeria	3	1.63%
17	Islamic Republic of Iran	3	1.63%
18	Croatia	3	1.63%
19	Russian Federation	2	1.09%
20	Pakistan	2	1.09%
21	Mexico	2	1.09%
22	Indonesia	2	1.09%
23	Czech Republic	2	1.09%
24	Canada	2	1.09%
25	Argentina	2	1.09%
26	Other countries who have contributed to only one journal (Venezuela, Bolivarian Republic of, Slovenia, Peru ,Netherlands, Morocco, Macedonia the former, Yugoslavia Republic, Italy, Hungary, Greece, Ethiopia, Colombia, China, Chile, Bulgaria)	14	7.61%
	Total	184	100%

9. Publisher-Wise Distribution of Journals

In this table the attempt has been made to find out the publisher wise contribution of Open Access journals in Chemistry that have appeared in DOAJ. Against this background, 184 journals were published by 96 (52.17%) publishers with independent/commercial publishers occupying the top position. This is followed by the academic institutions which are placed second with 36 (19.56%) journals. The Association/societies publish about 32 (17.39%) journals in chemistry whereas 20 (11.11%) journals are published by libraries which are less in number as compared to other contributing categories in DOAJ.

Table- 4 Publisher wise of distribution of the Journals

Body of publisher	No. of journals	percentage
Independent/Commercial publishers	96	52.17%
Academic institutions publishers	36	19.57%
Association/societies publishers	32	17.39%
Libraries publishers	20	10.87%
Total	184	100%

10. Language Wise Distribution of Journals

The Language wise distribution, the data shown in Table-5 reveals that English with 162 (81.81%) out of 184 journals is the most popular language of the total open access journals in chemistry field that have appeared in DOAJ. However, Spanish language with 9 (4.54%) journals is next popular language. This is followed by the Portuguese with 6 journals constituting 3.03% of the total open access journals in chemistry, Russian languages with 3 journals constituting 1.51%. This is followed by the Ukrainian, Serbian, Korean, French languages that constitutes 2 journals each and contribute about 1.01% each in open access journals in chemistry. Other countries languages including Turkish, Slovak, Romanian, Polish, Japanese, Indonesian, German, Czech, Croatian and Chinese have contributed only one journal in chemistry field in DOAJ.

Table-5 Language Wise Distribution of Journals

Language	No. of Journals	Percentage
English	162	81.81%
Spanish	9	4.54%
Portuguese	6	3.03%
Russian	3	1.51%
Ukrainian	2	1.01%
Serbian	2	1.01%
Korean	2	1.01%
French	2	1.01%
Other languages in which only one journal is published (Turkish, Solvac, Romanian, Polish,, Japanese, Indonesian, German, Czech, Croatian, Chinese)	10	5.05%

Note: Some of the journals are available in multiple languages

11. Format of Open Access Journals

It is observed from the study that, publishing pattern of Open Access journals. In this regard, the table-6 examines that, 94 (51.09%) of the journals available in DOAJ are accessible in online or e-format only whereas the rest of them i.e. 90 (48.91%) are published both in print as well as in online format.

Table-6 Format of Open Access Journals

Format	No. of Journals	Percentage
Both Print and Online	90	48.91
Online Only	94	51.09
Total	184	100

12. Indian Contribution

Regarding Indian contribution, out of the total number of 184 journals from Chemistry discipline in DOAJ, 26 journals are contributed from India. Of these 26 journals, 1 journal is from analytical chemistry, 1 from organic chemistry and the rest 24 belongs to chemistry general. On contrary, the publisher-wise

categorization indicates that International Journal of Analytical and Bio analytical Chemistry is published by Universal Research Publications whereas Indian Journal of Chemistry : Section B, a journal in Organic and Medicinal Chemistry is being published from NISCAIR along with Indian Journal of Chemistry : A, which publishes papers in synthetic and structural inorganic chemistry, bio-inorganic chemistry, inorganic reaction mechanisms, solid state chemistry, thermodynamics, spectroscopy, theoretical and quantum chemistry, nuclear chemistry, polymers, catalysis and analytical chemistry. The Journal of Chemical Sciences and Proceedings of Indian Academy of Sciences: Chemical Sciences are published by Indian Academy of Sciences, Bangalore. While as the American Chemical Science Journal and International Research Journal of Pure and Applied Chemistry are published by Science domain International.

The other journals as mentioned elsewhere in the paper are published by different publishers. The findings further reveal that all the journals published from India appear in English language only. It may be pointed out here that the Proceedings of Indian Academy of Sciences: Chemical Sciences is reported to be the oldest Indian journal on DOAJ that has started publishing since 2005.

Table-7 Indian Contributions to OA Journals

Name of Journal	Publisher	Subject	Starting Year	Language
Journal of Chemical Sciences	Indian Academy of Sciences	Chemistry (General	2005	English
Advanced Materials Letter	VBRI Press	Chemistry (General)	2010	English
American Chemical Science Journal	Science domain International	Chemistry (General)	2012	English
Annaien der Chemischen Forschung	Ingenious Knowledge Solutions	Chemistry (General)	2013	English
Carbon :Science and Technology	Applied Science Innovations Pvt Ltd	Chemistry (General)	2008	English
Chemical Science Review and Letter	Aufau Periodicals	Chemistry (General)	2013	English
Chemical Science Transaction	www publication(p) India	Chemistry (General)	2013	English

Der Chemica Sinica	Pelagia Research Library	Chemistry (General)	2010	English
Heterocyclic Letter	Raman Publications	Chemistry (General)	2012	English
Indian Journal of Chemistry: A	NISCAIR	Chemistry (General)	2008	English
Indian Journal of Biochemistry & Biophysics	Horizon Research Publishing corporation	Bio-chemisry	2008	English
Indian Journal of Chemistry: Section B	NISCAIR	Organic Chemistry	2008	English
International journal of chemical science	Sadguru Publications	Chemistry (General)	2011	English
International Jounal of Research in Chemistry and Enviroment	International Journal of Research in Chemistry and Environment	Chemistry (General)	2011	English
International Journal of Biochemistry Research & Review	Science Domain International	Bio-chemisry	2012	English
International Journal of Analytical and Bioanalytical Chemistry	Universal Research Publications	Analytical Chemistry	2011	English
International journal of Chemistry and Pharmaceutical Science	International Journal of Chemistry and Pharmaceutical Sciences	Chemistry (General)	2013	English
International Journal of Chemistry Research	Academic Sciences	Chemistry (General)	2010	English
International Journal of Green and Herbal Chemistry	Scientific and Academic Publications	Chemistry (General)	2013	English
International Journal of Research	Sure Shot Post Online Pulishing(SSPOP)	Chemistry (General)	2010	English
International Research Journal of Chemistry	International Research Journal of Chemistry	Chemistry (General)	2013	English

International Research Journal of Pure and Applied Chemistry	Science domain International	Chemistry (General)	2012	English
Journal of Applicable Chemistry	St. Mary's College of B. Pharmacy	Chemistry (General)	2013	English
Journal of Natural Products	Journal of Natural products	Chemistry (General)	2010	English
Oriental Journal Of Chemistry	Oriental Scientific Publishing	Chemistry (General)	2012	English
Rasayan Journal of Chemistry	Rasayan Journal of Chemistry	Chemistry (General)	2009	English
Reserch and Reviews: Journal of chemistry	Shastri Educational Trust	Chemistry (General)	2013	English

13. Conclusion

The emergence of electronic information resources has radically rejuvenated the status of all the libraries and information centers across the world during the last decade. There has been a speedy urge of the user community to get more and more information online. The study found that Independent/ commercial publishers as the leading publishers of open access journals in DOAJ. Interestingly, India is not behind in this direction as it contributes a number of journals in open access format in primer directories of open access across the world. Appreciably, it shares around 26 open access journals in chemistry discipline to DOAJ and is placed second only after Egypt in producing chemistry open access journals. Further, NISCAIR (National Institute of Science Communication and Information Resource) and Indian Academy of Science also contribute two journals each in DOAJ. The study, however, suggests that more open access journals are likely to come up in near future with the efforts and initiatives taken by the academic and research institutions of the country.

This study also highlights that efforts should be taken at national level to encourage open access publishing in the country by realizing the remarkable potential of open access journals. Furthermore, the study recommended that the entire academic and research institutes should pool their efforts together and try to highlight their pioneering work and research output across the world by providing an open access to their content so that the knowledge is promptly disseminated to the society at large for its overall growth and development. Significantly, such

initiatives would resolve the issues of accessibility, visibility, paucity of funds and escalating prices for subscribing journals in print format.

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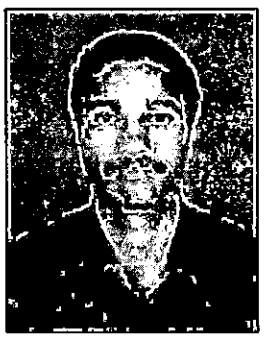
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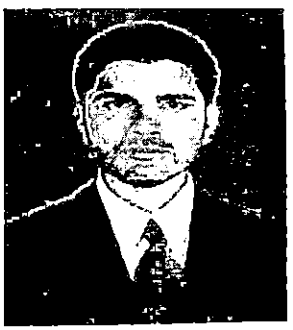
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AWARENESS AND USE OF E-JOURNALS IN TECHNOLOGICAL AND AGRICULTURAL UNIVERSITIES OF PUNJAB, HARYANA, CHANDIGARH AND DELHI

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Abstract: This paper highlights the awareness and use of electronic journals (e-Journals) in a few north Indian Agricultural and Technological universities of Punjab, Haryana, Chandigarh and Delhi. Data was collected through a well structured questionnaire and interview method from the UG, PG, Research scholars and teachers. It was found that the actual difference of awareness of engineering professionals (71.16 percent) and agricultural (64.38 percent) professionals was statistically not significant and they had broadly same level of awareness of e-journals. Use of e-journals in Engineering universities (59.26 percent) and Agricultural universities (54.90 percent) was also not significantly different which means the professionals of engineering and agricultural universities made similar use of e-journals.

1. INTRODUCTION

After the advent of Internet, e-resources have flourished in an astonishing way and have become the focus of research and development institutions in recent years. E-journals are important figure of e-resources as they play important role in scholarly communication. E-journals are available or accessible to multiple users at their desktops simultaneously with the support of required technology. Various researchers are getting more and more benefits by accessing required information from e-journals. Thus, e-journals have unsurprisingly proved a very beneficial and well liked tool for the scholarly community of every university for locating their desired information. Kacherki and Thombare (2010) have rightly said that "Journals in a library play vital role in distributing nascent facts and primary information to users. They publish articles and papers on recent research and development, particularly in the ever changing fields of management, science, and technology. Advent of electronic journals (e-journals) during recent years has given librarians a powerful new resource to support learning and research".

Indian Academic Libraries are subscribing foreign and Indian print journals in a very effective way weather they are purchased through a vendor or through

different publishers. But, there is still a very much need to subscribe only online journals/e-journals keeping in mind the competitive environment under the umbrella of ICT.

Many people have defined e-journals in different way. Gupta, V (2008) has very rightly defined print and e-journal as "A Journal is a periodical, especially one containing scholarly articles or disseminating current information on research and development in a particular subject fields. The work is done by an electronic media; it may be called an e-journal".

2. NEED OF THE STUDY

Indian universities are spending a huge amount of money on subscription of print and e-resources for the user community. The present study was conducted to know the awareness, preference and use of print and electronic journals in a few **Technical** (Engineering and Agricultural) universities.

3. SCOPE OF THE STUDY

The scope of the present study covers user awareness and use of e-journals in technical universities in Haryana, Punjab, Chandigarh and Delhi. The universities which fall under these states are:

Technological or Engineering Universities

- Indian Institute of Technology, New Delhi
- Punjab Engineering College, Chandigarh
- Thapar Institute of Engineering & Technology, Patiala
- National Institute of Technology, Jalandhar
- National Institute of Technology, Kurukshetra

Agricultural Universities

- Indian Agricultural Research Institute, New Delhi.
- Punjab Agricultural University, Ludhiana.
- Ch. Charan Singh Haryana Agricultural University, Hisar.

- National Dairy Research Institute, Karnal.

It was decided to include a total number of ten university libraries for the present work but out of these ten universities, one technical university named 'Punjab Technical University' did not have its own academic campus and central library so, it was decided to study only nine universities.

4. OBJECTIVES

The main objective of the study is to know the awareness and use of e-journals in engineering and agricultural universities of Haryana, Punjab, Chandigarh and Delhi. Within this broad objective, the study is specifically intended to:

- Know the user awareness of e-journals;
- Sources of awareness of e-journals
- Identify the user preference for format of journals;
- Assess the use of e-journals; and
- Ascertain the level of satisfaction of users with e-journals

5. METHODOLOGY

The well structured questionnaires were administered to teachers, research scholars and students of different universities in 2009-10. Visits of libraries, departments and hostels were conducted for taking response through the questionnaires. For filling up the questionnaire from teachers concerned head of the departments were consulted in most of the universities while in the case of research scholars and students, questionnaires were randomly distributed in departments, hostels and libraries. During this survey discussions were made randomly. Despite all efforts all the respondents did not answer all questions in the questionnaire. In all 684 usable questionnaires were available for further analysis. Thus the present study is based on the response provided by 684 respondents in both type of universities. The response of user information collected about various aspects related to awareness and use of e-journals by students and faculty was categorized, codified and recorded in SPSS package (16.0 versions). For drawing inferences, chi square (χ^2) was used. This test was used with .05 level of confidence.

6. AWARENESS OF E-JOURNALS

Analysis and interpretation of the data related to awareness of e-journals in technical universities has been presented in following tables (table 1-3). This aspect includes awareness of e-journals, status wise awareness of e-journals and sources of awareness of e-journals..

Table. 1 Awareness of e-journals

Awareness	Engineering N (%)	Agricultural N (%)	Total N (%)	χ^2, d.f
Yes	269 (71.16)	197 (64.38)	466 (68.13)	3.585, 1
No	109 (28.84)	109 (35.62)	218 (31.87)	
Total	378 (100.00)	306 (100.00)	684 (100.00)	

Table 1 shows the awareness of e-journals among engineering and agricultural professionals. Out of a total of 684 respondents, only 466 responded to this question. The respondents who left this question blank were considered to be the unaware of e-journals as they also left other questions related to use of e-journals unanswered. In engineering universities, 71.16 percent respondents were aware of e-journals and 28.84 percent were not aware of them. In agricultural universities 64.38 percent respondents were aware of e-journals and 35.62 percent were not. Overall, in technical universities, more than half the respondents (68.13 percent) were aware of e-journals while 31.87 percent were not aware at all.

When this response was statistically tested, it was not found to be significantly different. Thus it can be said that the level of awareness among respondents of engineering and agricultural universities was similar.

Table. 2 Status wise awareness of e-journals

Status	Engineering N (%)	Agriculture N (%)	Total N (%)	χ^2 d.f.
UG	72 (48.00)	22 (44.00)	94 (47.00)	61.965*
PG	100 (78.74)	34 (32.38)	134 (57.76)	
RS	59 (98.34)	66 (98.51)	125 (98.43)	
Faculty	38 (92.68)	75 (89.28)	113 (90.40)	
Total	269 (71.16)	197 (64.37)	466 (68.13)	

Table 2 shows the status wise awareness of e-journals in technical universities. It is clear from the above table that almost all the research scholars in both type of univer-

sities (98.34 percent in engineering and 98.51 percent in agriculture) were aware of e-journals, followed by faculty members (92.68 percent in engineering and 89.43 percent in agriculture). More than three fourth PG students (78.74 percent) in engineering and only 32.38 percent in agricultural universities were aware while less than half the number of UG students in both type of universities (48.00 percent in engineering and 44.00 percent in agriculture) were aware of e-journals. When the response was statistically tested, it was found significantly different thereby indicating that awareness of different category of respondents in both type of universities was not same.

Table. 3 Sources of awareness of e-journals

Sources	Engineering N=254 N (%)		Agriculture N=182 N (%)		Total N=436 N (%)		χ^2, d.f
	Y	N	Y	N	Y	N	
Internet/ Intranet	142 (55.90)	112 (44.10)	86 (47.25)	96 (52.75)	228 (52.29)	208 (47.71)	3.182 1
Web Newsletter / Newsletter	139 (54.72)	115 (45.28)	84 (46.15)	98 (53.85)	223 (51.15)	213 (48.85)	3.117 1
Colleague Reference	106 (41.73)	148 (58.27)	69 (37.91)	113 (62.09)	175 (40.14)	261 (59.86)	0.644 1
Students	102 (40.16)	152 (59.84)	67 (36.81)	115 (63.19)	169 (38.76)	267 (61.24)	0.500 1
Librarian Guidance	85 (33.46)	169 (66.54)	78 (42.86)	104 (57.14)	163 (37.38)	273 (62.62)	3.996* 1
Print Journals/ magazine	84 (33.07)	170 (66.93)	60 (32.97)	122 (67.03)	144 (33.03)	292 (66.97)	0.001 1
Workshop Seminar	78 (30.71)	176 (69.29)	43 (23.63)	139 (76.37)	121 (27.75)	315 (72.25)	2.652 1

Table 3 shows the different sources from which users became aware of e-journals. In engineering universities, more respondents (55.90 percent) became aware of e-journals through Internet/Intranet than in the agricultural universities (47.25 percent). 54.72 percent respondents in engineering universities came to know about e-journals through Web Newsletter/Newsletters which was also more than the agricultural university libraries (46.15 percent). Similarly, more engineering respondents (41.73 percent) came to know about e-journals through their colleagues than the agricultural respondents (37.91 percent). Response of both the universities regarding awareness of e-journals through other sources like Students, Print journals/ Magazines and Workshops Seminar etc. was also on similar pattern where engineering respondents used these services more than agricultural respondents. A little more number of agricultural respondents (42.86 percent) became aware of e-journals under Librarian guidance than the engineering respondents (33.46 percent). Overall, in technical university libraries, two important sources of awareness of e-journals were Internet/Intranet (52.29 percent) and Web/ Newsletter (51.15 percent) followed by Colleague reference (40.14 percent), Students (38.76 percent), Librarian guidance (37.38 percent), Print Journals/ Magazines (33.03 percent) and Workshops Seminars (27.75 percent). It is also clear from the above table that majority of users have become aware of e-journals by using internet/intranet in agricultural as well as in engineering universities, while least number of users through librarian guidance and workshops & seminars.

When the responses for different sources-Internet/ intranet, Web/Newsletter, Colleague reference, Student, Print Journals/ Magazines and Workshops Seminars were statistically tested they were not found significantly to be different. Thus it can be said that respondents of both the universities used theses sources to become aware of e-journals more or less in similar way. But when the response for the librarian's guidance was statistically tested this was found significantly different indicating that the respondents used this sources differently to become aware of e-journals.

7. USE OF E-JOURNALS

Analysis and interpretation of the data related to use of e-journals in technical universities has been presented in following tables (table 4-10).

Table. 4 Use of e-journals in technical universities

Use	Engineering N (%)	Agriculture N (%)	Total N (%)	χ^2
Yes	224 (59.26)	168 (54.90)	392 (57.31)	1.312
No	154 (40.74)	138 (45.10)	292 (42.69)	

Table 4 shows the number of users and non users of e-journals. In engineering universities 59.26 percent respondents were using e-journals and 40.74 percent did not use them. In agricultural universities 54.90 percent respondents were using e-journals and 45.10 percent did not use them. Thus, almost same number of respondents in engineering universities and agricultural universities made use of e-journals. Overall, in technical universities, more than half the respondents (57.31 percent) used e-journals while 42.69 percent did not make use of these sources. When the response was statistically tested, it was found significantly not different thereby indicating towards the similar use of e-journals in both type of universities.

Table. 5 Status wise use of e-journals

Status	Engineering N (%)	Agriculture N (%)	Total N (%)	χ^2, d.f
UG	50 (33.33)	9 (18.00)	59 (29.50)	
PG	80 (62.99)	24 (22.86)	104 (44.83)	
RS	57 (95.00)	65 (97.01)	122 (96.06)	62.626*, 3
Faculty	37 (90.24)	70 (83.33)	107 (85.60)	
Total	224 (100.00)	168 (100.00)	392 (100.00)	

Table 5 shows the status wise use of e-journals in technical universities. It is clear from the above table that research scholars in both type of universities (95.00 percent in engineering and 97.01 percent in agriculture) used e-journals the most followed by faculty members (90.24 percent in engineering and 83.33 percent in agriculture). More than half of the PG students (62.99 percent) in engineering and only 22.86 percent PG students in agricultural universities made use of e-journals. Relatively small number of

UG students in both type of universities (33.33 percent in engineering and 18.00 percent in agriculture) used e-journals. When the responses were statistically tested, it was found significantly different thereby indicating towards the different use of e-journals among different categories of users.

Table 6 Place of accessing e-journals

Place	**Engineering N=223 N (%)**		Agriculture N=168 N (%)		Total N=391 N (%)		χ^2, d.f
	Y	N	Y	N	Y	N	
Campus library	111 (49.78)	112 (50.22)	123 (73.21)	45 (26.79)	234 (59.85)	157 (40.15)	21.905*, 1
Teacher/ Researchers' room	71 (31.84)	152 (68.16)	49 (29.17)	119 (70.83)	120 (30.69)	271 (69.31)	0.322 1
Hostel	59 (26.46)	164 (73.54)	30 (17.86)	138 (82.14)	89 (22.76)	302 (77.24)	4.031*, 1
Dept lab	63 (28.25)	160 (71.75)	22 (13.09)	146 (86.91)	85 (21.74)	306 (78.26)	12.936*, 1
Dept library	26 (11.66)	197 (88.34)	34 (20.24)	134 (79.76)	60 (15.35)	331 (84.65)	5.428*, 1
Cyber café	18 (8.07)	205 (91.93)	10 (5.95)	158 (94.05)	28 (7.16)	363 (92.84)	0.647, 1
Other places	7 (3.14)	216 (96.85)	11 (6.59)	157 (93.41)	18 (4.63)	371 (94.88)	2.535, 1

Table 6 shows the places where e-journals were being used by respondents. Out of total 392 respondents who used e-journals, 391 respondents responded to this question. In agricultural universities three fourths of respondents (73.21 percent) and in engineering universities half the respondents (49.77 percent) accessed e-journals at campus library, whereas almost same number of respondents in engineering universities (31.84 percent) and agricultural universities (29.16 percent) accessed e-journals from teachers'/ researchers' room. More respondents at engineering universities (26.46 percent) ac-

cessed e journals at their hostels than the agricultural universities (17.86 percent). More respondents at engineering universities (28.25 percent) accessed e-journals at departmental labs than the agricultural universities (13.09 percent) while more respondents in agricultural universities (20.24 percent) accessed e-journals at departmental libraries than engineering universities (11.66 percent). On the other hand almost same number of respondents in engineering universities and agricultural universities accessed e-journals from cyber cafe and other places . Overall, in technical university libraries more respondents accessed e-journals at campus library (59.85 percent) followed by teachers /researchers room (30.69 percent), hostel (22.76 percent), departmental lab (21.74 percent), departmental library (15.35 percent), cyber café (7.16 percent) and other places (4.63 percent).

When the responses for campus library, hostel, departmental lab, departmental library were statistically tested, they were found significantly different thus indicating that engineering and agricultural professionals differed in the use of these places for accessing e-journals while the responses for teachers'/researchers' room, cyber cafe and other places were significantly not different thus indicating similar use of these places for accessing e-journals.

The reason for less use of campus library by engineering respondents is that the access to internet/intranet was provided in faculty cabins, labs, and hostels in all the engineering universities. And so, they did not feel more need to visit the campus library to access e-journals. On the other hand, access to internet/intranet was not given in hostels in most of the agricultural universities. Among four agricultural universities, only IARI had given internet/intranet access to the hostels.

Table 7 Purpose of using e-journals

Purpose	Engineering N (%)		Agriculture N (%)		Total N (%)		χ^2, d.f
	Y	N	Y	N	Y	N	
Research Work	105 (46.87)	119 (53.12)	145 (86.31)	23 (13.69)	250 (63.77)	142 (36.22)	64.620*, 1
Current Awareness	104 (46.43)	120 (53.57)	80 (47.62)	88 (52.38)	184 (46.94)	208 (53.06)	0.090, 1
Writing Papers	89 (39.73)	135 (60.27)	86 (51.19)	82 (48.81)	175 (44.64)	217 (55.36)	5.444*, 1
Preparing notes	72 (32.14)	152 (67.86)	57 (33.93)	111 (66.07)	129 (32.91)	263 (67.09)	0.162, 1

Teaching	27 (12.05)	197 (87.95)	49 (29.17)	119 (70.83)	76 (19.39)	316 (80.61)	17.989*, 1

Table 7 shows the different purposes of users in using e-journals. In agricultural universities, more respondents (86.31 percent) made use of e-journals for their research work than the respondents in engineering universities (46.87 percent). Similarly, more agricultural respondents (51.19 percent) made use of e-journals for the purpose of writing research papers than engineering respondents (39.73 percent). On the similar pattern, more teachers at agricultural universities (29.17 percent) made use of e-journals for teaching purpose than engineering universities (12.05 percent). Use of e-journals for Current Awareness and Preparing notes was almost same in both types of universities. Overall, in technical universities e-journals were primarily used for the purpose of conducting research work (63.77 percent) followed by current awareness (46.94 percent), writing papers (44.64 percent), preparing notes (32.91 percent) and teaching (19.39 percent).

When the responses for the purposes of research work, writing papers and teaching were statistically tested, they were found significantly different indicating that respondents of

engineering and agricultural universities differ in using e-journals for these purposes while the responses for Current Awareness Service and Preparing notes were not found significantly different thereby, indicating that respondents of engineering and agricultural universities use e-journals for these purposes broadly in similar way.

It is necessary to point out here that more agricultural respondents used e-journals for research work, writing papers and teaching than engineering respondents the difference here may be due to more strength of faculty members and research scholars in agricultural universities than the engineering universities. It is clearly reflected from above table that majority of respondents are using e-journals for doing their research work in agricultural as well as in engineering universities.

Table 8 Comparison of period of use of print and e-journals

Research journals	Engineering universities	Agricultural universities
Print journals	1-2 years (22.77 percent)	More than 5 year (42.86 percent)
e-journals	1-2 years (37.50 percent)	1-2 years (26.95 percent)

Table 8 shows the modal cells and their frequencies for period of use of print and e-journals in engineering and agricultural universities. For respondents in engineering universities modal value falls in the category of 1-2 years for both print and e-journals. The modal value of response of agricultural universities falls in the category of more than 5 years for print journals and 1-2 years for e-journals.

It is clear from the table that larger number of respondents of engineering universities and a comparatively small number of respondents of agricultural universities were using print journals for 1-2 years while in agricultural universities respondents were using print journals for more than 5 years. On the other hand the maximum use of e-journals was being made in both the universities for last 1-2 years. The longer period of use of print journals in agricultural universities is mainly due to faculty with vast experience forming large group of respondents.

Table 9

Access mode of e-journals

Access Modes	**Engineering N=220** N (%)		**Agriculture N=167** N (%)		**Total N=387** N (%)		χ^2, d.f
	Y	N	Y	N	Y	N	
Library/ Consortia portal	146 (66.36)	74 (33.64)	109 (65.27)	58 (34.73)	255 (65.89)	132 (34.11)	0.051, 1
Search Engine	113 (51.36)	107 (48.64)	81 (48.50)	86 (51.50)	194 (50.13)	193 (49.87)	0.250, 1

Publisher Website	53 (24.09)	167 (75.91)	42 (25.15)	125 (74.85)	95 (24.55)	292 (75.45)	0.046, 1
CD ROM Database	05 (2.27)	215 (97.72)	49 (29.34)	118 (70.66)	54 (13.95)	333 (86.05)	57.935*, 1

Table 9 shows different access modes of e-journals like library/ consortia portal, publisher website, search engines and CD ROM databases being used by respondents. Out of total 392 respondents 387 responded to this question. Use of e-journals through library/ consortia portal was most preferred mode for both engineering (66.36) and agricultural universities (65.27). The second preferred mode was search engine in both the universities (51.36 percent in engineering and 48.50 percent in agriculture). Almost every fourth respondent in both the universities (24.09 percent in engineering and 25.15 percent in agricultural) used publisher website for accessing e-journals. Significantly more number of respondents in agricultural universities (29.34 percent) used CD ROM databases for the same purpose while in engineering universities the response was only 2.27 percent. Higher use of CD-ROM in agricultural universities is due to the reason that all agricultural universities subscribe theses databases and provide them through intranet.

When the responses for different access modes were tested statistically no significant difference was found in the use of library/ consortia portal, publisher website and search engines. However the response on the use of CDROM databases was significantly different and agricultural universities were using these databases more than engineering universities.

Modern databases continue the heritage of indexing and abstracting sources in scholarly world. Researchers the world over use different subject specific databases. The new developments in ICT have made databases quite versatile. Some of the bibliographic databases have become full text databases while others provide links to full text databases. Major publishers have developed their own collections of journals with access mechanism similar to these databases. All the respondents used one or more databases. They were requested to specify the name of databases they were aware and use for their education and research activities. Table 6.33 lists all the databases and publishers' websites mentioned by respondents. Although some users did not responded to this ques-

tion. The larger number of respondents in engineering universities used Science Direct (108) followed by IEEE (80) and in agricultural universities CAB/CABI (93) and AGRICOLA (68) were the most used databases. Ce Direct and IEEE, other databases mentioned by 10 or more respondents in engineering universities were: Springer (39), ACM (19), Elsevier (14), ASME (13), ASCE (12), Emerald (11) and Tailor & Frances (10). Total 11 databases were mentioned by respondents of agricultural universities. Besides CAB and AGRICOLA other databases mentioned by agricultural universities respondents with more than ten frequency were: Science Direct (21), PubMed/ Medline (20), AGRIS (17), Winspires' databases (15), DOAJ (14), J-gate (12) and Biological Abstracts (11).

Table 10 Comparison of change in use of articles in print and e- format

Research articles	Engineering universities	**Agricultural universities**
Print articles	Decreased (51.16 percent)	Decreased (75.00 percent)
e- articles	Increased (60.77 percent)	Increased (70.34 percent)

Table 10 shows the modal cells and their frequencies of reading print and e-articles in engineering and agricultural universities during last one year. For respondents in engineering universities modal value falls in the category of decrease in print journals and increase in e-journals. The modal value of response of agricultural universities falls in the similar category of decrease in print journals and increase in e-journals. However, in both the cases trend was more intense in agricultural universities.

Table 11 Satisfaction level of respondents

Satisfaction level	Engineering N=224 N (%)	**Agriculture N=167 N (%)**	**Total N=392 N(%)**	χ^2
Fully Satisfied	79 (35.27)	69 (41.32)	148 (37.85)	2.017, 3
Partially Satisfied	130 (58.03)	85 (50.90)	215 (54.99)	
Least Satisfied	11 (4.91)	10 (5.99)	21 (5.37)	
Not satisfied	4 (1.78)	3 (1.79)	7 (1.79)	
Total	224 (100.00)	167 (100.00)	391 (100.00)	

Table 11 shows the level of satisfaction of respondents in using e-journals. Out of 392 respondents 391 responded to this question. In agricultural universities more respondents (41.32 percent) were fully satisfied with use of e-journals than the respondents in engineering universities (35.27 percent). More respondents in engineering universities (58.03 percent) were partially satisfied with use of e-journals than the respondents in agricultural universities (50.90 percent). Almost same number of respondents in agricultural universities (5.99 percent) and engineering universities (4.91 percent) were least satisfied with use of e-journals. Whereas, a small number of engineering universities respondents (1.78 percent) and agricultural universities respondents (1.79 percent) were not satisfied while making use of e-journals.

When this response was statistically tested, it was found significantly not different thereby indicating that respondents of engineering and agricultural universities have almost same satisfaction levels with use of e-journals.

8. CONCLUSION

A few years back, e-journals were not so much popular as they are at this time. Earlier, they were being subscribed in small number of libraries but now they are made available in most of the libraries through various modes. But still, there is a lot of variation in the availability of e-journals in different university libraries and their awareness and use among user community of different universities. Therefore it is necessary to know how much population in different type of universities is really aware of e-journals. The people who are aware of and use these special kind of e- resources are they really satisfied with use of e-journals and if not what are the reasons behind that, so that, they could be solved and use of e-journals could be promoted. In the present study an effort has been made to know the awareness and use of e-journals among the user community of two different groups of universities i.e. engineering and agricultural universities.

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Best Practices at Vijayanagara sri Krishnadevaraya University Central Library Ballari

Shanmukhappa.K

Abstract: The paper mentions the Best practices carried out at Best Practices at Vijayanagara Sri Krishnadevaraya University Library to increase the reading habits among the users, to create awareness and involve the students in collection development activities. The goal, process and impact of each practice are explained.

Keywords: Central Library, Best Practices, CD-ROM Databases, Sri Krishnadevaraya

1. Introduction:

Library plays a very important role in any institution as it fulfills the needs of users. It is the library which creates congenial atmosphere to increase our knowledge. Library is a knowledge center which has rich information resources stored in different ways both in print and electronic form. Internet is network of networks, it provides seamless access to wide variety of information by not limited to a particular subject or language. Electronic resources like CD-ROM databases, Open sources materials, Online books, online research works, online databases, online journals, OPAC and internet etc. are slowly replacing the importance and usage of print media. Electronic resources have exploded in popularity and use.

Library and information centers are pivotal hubs for every institution for its developments. The contribution made by libraries for growth of its parent organizational is always significant and notable. Depending upon the collection, type, nature and size libraries fall into several different categories like academic, national, public, digital, virtual etc. in spite of several differences the prime objective of each library is to provide the right information to the right user at the right time. The successful achievements of this goal depend upon the practice of providing quality of services adapted by the library manager.

The enable innovation in teaching, and they increase timelines in research as well as increase discovery and creation of new fields of inquiry.

Electronic resources play a prominent role in facilitating access to accurate, timely and relevant information to the users and they become part of the library resources. The main objectives of any library are to cope with the challenges of

providing its use community with increased access to knowledge in any form at anytime distance. Academic library must decide what focus they take in collecting materials since no single library can supply everything. When there are particular areas of specialization in academic libraries these are often referred to as niche collections.

2. Vijayanagara Sri Krishnadevaraya University (VSKU) :

Vijayanagara Sri Krishnadevaraya University is a new university established in 2010 by the Governement of Karnataka at Ballari district though the Karnataka State Universities Act, 2000. It has benn named after Krishnadevaraya former emperon of the Vijayanagara Empire. Vijayanagara Sri Krishnadevaraya University (VSKU) is a State University. It is an affiliating university with about 100 affiliated colleges offering both undergraduate and postgraduate programs. The university covers the districts of Ballari and Koppal. The region under the jurisction of the university is considered economically and educationally backward compared to national and state average. Hence, the university endeavors to embark on innovative means of higher education in order to make it both quantitative and affordable.

VSKU has three graduate campuses. The main campus, "Jnana Sagara" is located at Vinayaka Nagar, Ballari. The main campus, spread over an area of about 100 acres, houses all the key administrative departments of the university as well as post graduate departments. The second campus "Jnana Sarovara" is located at Nandihalli in Sandur Taluka of Ballari District. This lush green campus has 10 post graduate courses with adequate hostel facilities for boys and girls as well as accommodation to faculty. A new campus has come up in Koppal this year.

3. Vijayanagara Sri Krishnadevaraya University Central Library:

Vijayanagara Sri Krishnadevaraya University Central Library has a collection of 19500 documents. It is kept open 12 hours a day. The library is fully supported by IT infrastructure. The library has been equipped with the latest software packages, CDs, Videos, Indian and International journals; magazines and research reports relating to management, science & technology, law and allied subjects. We subscribe to 16 International Journals and 25 National Journals. Access is also enabled to 5000+ Journals through the IEEE database. We also subscribe to 30 Indian Business Magazines and 5 International Business Magazines.

4. What is Best Practice?

A best practice is a method or technique that has consistently shown results superior to those achieved with other means, and that is used as a benchmark.

Hence, best practice is a course of action which is repeated at regular intervals an always gives extraordinary results. It is a value added standard practice which illustrate the quality of the services. A best practice may be an innovative, policy, program, process that created positives impact of the institution and solves the problems.

Vijayanagara Sri Krishnadevaraya University Central Library is expected to support the objectives of the University. Thus the basic function of Vijayanagara Sri Krishnadevaraya University Central Library is to assist its parent body to carry out its programs. Apart from this the main goals of VSKU Central Library:

- To encourage and motivate students to participate in various intercollegiate and completion and appear for various competitive exams.
- Conducting national book week on 14th to 18th of November of every year
- Conducting book exhibition every quarterly and participating different vendors and publishers Under the best users of the library for the year 5 students have been identified and awarded with Entrepreneurial motivational DVDs worth of Rs.1000/- cash prize
- Collection and preservation of knowledge
- To purchase latest publication books and journals
- To provide reference & reading material

Vijayanagara Sri Krishnadevaraya University Central Library is heart of the campus and its temple of learning. The mission of the library is to fulfill the goals of the university by providing qualitative services. The library is practicing to provide various services which are getting overwhelming responses every time and are put in the category of best practices by Library Advisory committee (LAC) of Vijayanagara Sri Krishnadevaraya University Central Library. Following are few best practices conducted every year to inculcate reading habits in students, to improve their performance and involve students in collection development. There is a Library Advisory Committee (LAC) which holds meeting at regular intervals to contribute and ensure the smooth functioning of the library.

5. Inter Library Loan :

Inter Library Loan is the process by which a library requests material from, or lends material to, another library. The purpose is to obtain upon request of library user, material not available in the user's local library; the scope is intended to regulate the exchange of material between libraries.

6. Rules for Inter Library Loan :

- Under this scheme IBS libraries will transact the documents from one library to another.
- Before transacting the documents, librarians should observe the price of the publication; low priced editions need not be transacted; instead such documents could be procured.
- Rare/out of print publications should not transaction. Only scanned document or photocopy of the document should be arranged.
- Compared to book price, if courier charges are more, transactions are not encouraged.
- Requesting library is responsible for borrowed material (damaged/lost).
- Requesting library is responsible for handling charges of borrowed material.
- All borrowed material is subject to recall. The requesting library should respond immediately if supplying library recalls an item.

7. User Orientation Programmes :

The goal of this program is create awareness on library resources, services and facilities among new students to ensure optimum use. This is the orientation program to refresher who has joined the college during recent academic year. Instruction and presentation on use of catalogue, Web OPAC, familiarization with collection, types of resources available and range of services is highlighted. Information on rules and library enrollment membership is provided. The program starts with power point presentation followed by library tour in groups to familiarize students with all sections of the library.

8. Book Bank Scheme:

On the recommendation of Department Faculty, students are provided texts books and other reading material for the whole academic section till the exams. The main objective of this scheme is to provide text books and required study material to very poor and needy students free of cost for the exams. If any need arise to find out notes apart from books is fulfilled through using net search and other possible ways.

9. User Feedback:

This practice helps in collection development and to understand the needs of the students. During the year 2013-14, there was great demand by the students to develop a special section for competitive exams books, which was built and received overwhelming response by the students.To collect user inputs about the library services and collection, a questionnaire feedback is taken by s stunts. Depending upon the responses, required actions are taken by LAC committee to improve the functioning of library.

10. Best User of the Library:

The library every year gives best user of the Library on the annual day function. This award was introduced to increase use of reading material and services by the staff and students. This competition has increased enthusiasm to visit the library more and spends more time to read and win the award. So far 150 students have been identified and awarded. Who gives door services, quick respond, and supplies latest edition books with maximum books with low price and give maximum discount for those vendors our This practice helps in collection development and to understand the needs of the students. During the year 2015-16, there was great demand by the students to develop a special section for competitive exams books, which was built and received overwhelming response by the students. Library will provide best vendor certificate.

11. E-Library facility :

As the internet has become the prime need of modern life today. The library is providing internet services through E-library facility to the students. The aim behind this service is to avail the online resources to the college students, researchers and faculty members. This service is receiving great response from students of

12. Special Deposit Scheme (SDS) :

The goal of this practice is

- To provide the facility of VSKU central library to outsiders and ex-students
- To ensure optimal use of collection and services
- To serve the community near the institution
- To generate additional financial resources.

NJYKRC library is providing these services to the community people, researchers and ex students at affordable costs. Members of SDS have benefitted in getting reading facilities in nearby area, researcher and ex students could successfully use the competitive exam books for NET, Railway and Banking etc.

13. Suggestion Box:

If the students wish to give any suggestion or complaint regarding functions of the library a suggestion box maintained near the circular counter, to obtain the responses of students apart from the formally structured questionnaire. This helps in evaluating the regular and new services.

Academic libraries play important role in enhancing the quality of academic and research environment in the institution.. Vijayanagara Sri Krishnadevaraya University Central Library has practiced few best practices in this direction and always receives positive feedback from the students and other users.

14. Earn and Learn Scheme :

- "Earn & Learn" Scheme is implemented in the library for the PG & Research Scholars. Under this scheme students have been identified and they supposed to work in the library honorarium will be paid to those students.

15. Objective of the Vijayanagara Sri Krishnadevaraya University Central Library:

The objective of this paper is to explore E-resources and services to the users of Vijayanagara Sri Krishnadevaraya University Central Library. More precisely Such as;

- Book Lending Service
- Inter Library Loan / Document delivery service (through DELNET)
- Resource Cell for Competitive Examinations
- Displaying newspaper clippings on the notice board periodically.
- Career/Employment Information/services
- Reference Service
- Referral Service
- Serials Service
- User Awareness Service
- Information literacy groups
- Open access and Web OPAC
- Access and Issue of CD-ROMs
- New arrivals display / Online new arrivals service
- Book Exhibitions / Book shop visits
- Overnight issues and overnight studies
- Organizing books talks
- Conducting user surveys periodically
- Compiling question papers of university and college exams
- Communication of current awareness to different user groups
- Developing of website/web page for the library including all the services and necessary services
- Book exhibition and developing of e-deliveries
- To explore the use and purpose of electronic resources.
- To know the different types of e-resources and services available in the Library
- To find out the awareness and use of library resources by the readers.
- To find out the type of information sources used by the readers.
- To ascertain users opinion regarding usefulness and adequacy of information sources and services.

- To find out the major electronic resources accessed by the users
- To determine the level of satisfaction among the users of e-resources
- To identify the methods that the readers of the library adopt to locate the required information sources.
- To identify the problems and constraints facing by the users while using Electronic resources.
- To help the administrator of the library in preparing an enrichment program for better use of the library and facilitates generator
- To know the preferred form of the electronic resources by the users Reprography Service
- News paper clipping service

16. Conclusion:

Best Practice is a course of action which reveals the standard of an institution. Vijayanagara Sri Krishnadevaraya University Central Library being big unit always keep on making efforts to satisfy the needs of its users. The best practices described in the paper above are only the initiatives. The library has a vision to go long in this direction and strive for more than best for users and achieve the mission the institution

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Best Practices in Academic Libraries

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Abstract: To build up a library is to create a life. It's never just a random collection of books. How wonderfully said by 'Carlos Maria Dominguez'[1]. Yes, it is true that library is not just a mere collection of books but it helps to create life. The journey of libraries from beginning till now has drastically changed. Today as the days have changed it has become inevitable for libraries to provide their best service not only from within the walls but also extending their services out of the walls. To make it happen libraries have adopted the best practices which are advised by NAAC, this paper presents some of the 'Best Practices' that can be adopted by the academic libraries to improve the quality of the service they provide.

Keywords: Best practices, Academic Libraries, NAAC library guidelines.

1. Introduction:

First let us know what is a Library?

According to 'Cambridge University', "Library is a building room or organization that has a collection, especially books, for people to read or borrow usually without payment".[2]

Thus its work is to satisfy the users. To satisfy its user it has to provide better services. To provide better services it has to change itself according to the changing scenario. Thus today schools and college libraries are undergoing through the process of adopting the 'best practices' to ensure the best service to its user.

2. Best Practices

Definition: 1. ODLIS (Online Dictionary of Library and Information Science) describes as " in the application of theory to real life situations, procedures that, when properly applied consistently yield superior results and are therefore used as reference points in evaluating the effectiveness of alternative methods of accomplishing the same task. Best Practices are identified by examining empirical evidence of success".

2. Concise Oxford English Dictionary describes as best practices as "quality of most excellent or desirable type or most appropriate, advantageous, highly improved, outstanding par excellence services are the customary are expected procedure or way of doing something that is usual or expected way in a particular organization or situation, guidelines for good practices in this process of developing best practices we take action rather than good ideas and we improve our skill".[3]

From the above definition best practices means, it is a method or technique used to improve the current work flow of an organization to obtain its objective effectively and with pre determined standards.

3. NAAC Best Practices for library and Information Center:-

UGC and NAAC are playing an important role in providing guidelines to improve the overall quality of higher education in the country. NAAC has developed the set of best practices for the library and Information Centers.

The best practices are divided into four main categories viz,

- Management and Administration of Library
- Collection and Service
- Extent of use of services
- Use of information technology in libraries[4]

A. Management and Administration of Library- It is the basic and core element which helps the users to gain knowledge in an academic institution. It works hard on setting the goals and policies, its stock verification, development of manpower, development of basic infrastructure, budgeting and reporting. Regular commencement of meetings, discussions on providing quality services to the user, employing skilled and qualified staff, providing new technologies are few best practices that can be adopted under this title.

- Other best practices that can be included in this are:-

- Observation of other library practices by institutional visits.
- In – service programmes
- Staff promotional practices
- Maintenance of service areas
- Special deposits scheme
- Student internship programme
- Student participative programme
- Earn while learn programme[5]

B. Collection and Service- Best practice include a well defined collection development and management policies that ensure all the users get right information at the right time. It is the work of library to provide appropriate services to the different requirements of different user groups such as students, teachers and researchers.

- Today users demand well focused information retrieval system where they can extract any information at any time and at any place. To provide such service libraries need to inter connect themselves so that they can lead to new solutions and new services.
- Listed below are some of the best practices under this category
- Compact storage of less used collection
- Collection development in different formats
- Library book exhibition
- Extended library opening hours
- Extended hours of services[5]

C. Extent of use of services- For a library it is very much necessary to add new skills and approaches. With the traditional services it is not possible to maintain the quality of information services. Hence new ideas and plans have to be formulated to enhance the use of services.

- Some of the best practices that can be followed in enhancing the use of services in libraries are outlined below:-
- User education
- Initiation to fresher

- Preparatory course for students project
- Library use statistics
- Library best user award
- User feedback practice through suggestion boxes
- Information aids
- Course module on Library and information service[5]

D. Use of information technology in libraries- In this global world services of libraries need to reach the user desktop and it is possible by the use of information technology. Today IT has become an integral part of a library which has affected the activities of libraries.

- In this age of rapidly changing technology IT in libraries is no longer a matter of choice but a matter of survival. Thus the academic libraries have to be updated regularly so that it benefits the end users by fulfilling their requirements.
- Listed below are some of the best practices under this category
- Online information retrieval
- Free browsing / downloading unit
- Library home page for information dissemination
- Dynamic library website
- 24/7 Access to e-resources
- Digital access to all internal documents[5]

Other than these four main best practices that has been mentioned above there are other general best practices which can be conducted in routine in library they are:-

- Regular library advisory committee meeting
- Binding of books and periodical volumes
- Inclusive of library information in prospects and college websites
- Intercom facilities for easy communication among various departments
- Pasting of barcode, spine label and stamping in a definite place on the books
- Question sets of previous examinations

- Library calendar of activity and events
- Use of pesticides for keeping away book worm and damage of books
- Display of various library chart
- Keeping the library premises neat and clean.[5]

4. Why best practices in academic libraries?

This is the question that arises in everyone's mind. The answer to it is the following point's i.e.

- To execute the five laws of library science
- To magnetize and meet the user demand
- To maximize the utilization of library
- To identify the needs of the users[5]

5. Conclusion:-

The best practices make libraries to be more efficient in their work and also to improve its quality. With the help of IT libraries can hold out all the requirements of the user. With best practices libraries get new dimensions which help to reach its goal and also create its own image in the mind of students and society.

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Career Guidance to the Users: An Innovative Library Practices

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Abstract: Choosing a right career is a crucial task in the modern world as multidisciplinary professional paths are available in today's job market. There is a need to make an awareness among the college students about the different array of paths available to them to make a right choice. Career guidance and counsellingprograms in higher educational institutions aim to provide assistance and advice to students to make them more and better informed in their future educational and career choices.This paper highlights the role of libraries in providing career guidance to college students. An attempt is made in this paper is to focus the resources, activities, and benefits of career guidance services in Govt. first-grade college library, Hiriadka. The suggestion given by faculty members and students were also discussed.

Keywords: Career Guidance, Services, Suggestion, College Library, Career Development, Library Resources

1. INTRODUCTION:

According to Mark Twain, "There is no security in life, only opportunity." Choosing a career is a problem. It's about so much more than deciding what you will do to make a living. Once a person enters into the adulthood he has to make a choice about his career. At present, there is greater need to provide career guidance services in the college libraries. Career guidance at college level helps students to select subjects of specialization which assist them in choosing their right career. Career guidance helps students to understand their goals and aspirations, their identity, helps them make informed decisions, commit to activities, and manage changes in their career whether they are planned or not. Therefore, choosing a career means more than just getting and working at a job. Choosing the right career can be a very daunting task especially in a world, which offers an array of paths, all of which seem to be leading to a golden goal. Like, the famous adage goes, if you choose the job you love, you don't have to work a single day in your life. According to Sinz," It is crucial for colleges to offer career guidance aimed to help students make more informed and consequently better educational and career choices."As a quality career resource center, the library can play a significant role in guiding and directing students in making more suitable career options. Thus, govt. First-

grade college library, Hiriadka has made a point to an extent the services to meet the particular career needs of college students.

2. CAREER GUIDANCE: MEANING AND DEFINITION:

The concept of career guidance has been widely used since the early seventies, although only lately it has been insisted on a comprehensive approach to managing career during the entire lifetime. Career guidance is a process by which students become aware of the world of work, explore career options, and prepare for post-secondary opportunities. It is a comprehensive, developmental program designed to assist students in making and implementing informed educational and occupational choices. A career guidance and counselling program develops an individual's competencies in self-knowledge, educational and occupational exploration, and career planning.

Akinade (2012) defines guidance and counselling as a process of helping an individual become acutely aware of himself and the ways in which he is responding to the influences of his environment. It further assists him to establish some personal meaning for this behaviour and to develop and classify a set of goals and values for future behaviour.

The EU Council of Ministers' Resolution on Lifelong Learning from 2004, defines career guidance as a series of activities that train individuals of any age, at any moment of their lives, to identify their own abilities, competencies and interests, to make decisions that affect their education, work, and other areas where they might gain and apply abilities and competencies.

The definition of career guidance by OECD and the World Bank: "Career guidance refers to services and activities intended to assist individuals, of any age and at any point throughout their life, to make educational, training and occupational choices and to manage their career. Such services may be found in schools, universities, and colleges, in training institutions, in public employment services, in the workplace, in the voluntary or community sector, and in the private sector. The activities may take place on an individual or group basis and may be face-to-face or at a distance (including help lines and web-based services). They include tools, counselling interviews, career education programs (to help individuals develop their self-awareness, opportunity awareness, and career management skills), taster programs (to sample option before choosing them), work search programs, and transition services."

As a quality career resource centre, the library can take pride in the development and well-being of its users. It is necessary to provide career information literacy to the graduates so that they will be equipped with the knowledge about how to

seek, evaluate and select career information and this may lead to better decision making for the quality of their future life.

3. AIMS AND OBJECTIVES OF CAREER GUIDANCE PROGRAMME

Odu (2004) stated that the main aim of guidance and counselling is to assist the student to develop physically, mentally, emotionally, morally and educationally to cope with the learning situations within and outside the college environment.

The objectives are as follows:

- To help students to organize knowledge about themselves by identifying skills, interests and aptitudes.
- To provide information about further course prerequisites, financial aid, academic planning, entrance examinations, etc
- To provide information about specific occupations, career planning, conducting a job search, etc.
- To assist students in the development of skills necessary for decision-making, problem-solving, career and life planning.
- To help students develop the skills of self-study, self-analysis and self-understanding.
- To assist students in the process of developing and acquiring skills in problem solving and decision-making
- To develop in students an awareness of opportunities in the personal, social opportunities and vocational areas by providing them with appropriate, useful information.

4. CAREER DEVELOPMENT PROGRAMME IN COLLEGE LIBRARIES

Career development doesn't end there. After you choose a profession, you must then get the required education and training, apply for and find employment, and ultimately advance in your career. Career development is important in higher education because it helps the students to have a clear idea of career objectives, perusing their academic goals, getting career-related work experience and find employment in chosen fields.

In an academic institution, the library is the focal point where staff and students are energized and empowered with knowledge. Libraries ought to extend their support in all spheres of knowledge and by providing career information in the library. It will be helping the users to have an aim in their lives. A quality career service can help the students/graduates to find out their interests and abilities and to attain their dream job in the society. As a quality career resource centre, the library can take pride in the development and well-being of its users. To achieve this, library staff should strive and adapt according to the signs of the time. It is necessary to provide career information literacy to the graduates so that they will be equipped with the knowledge about how to seek, evaluate and select career information and this may lead to better decision making for the quality of their future life. Career development doesn't end there. After you choose a profession, you must then get the required education and training, apply for and find employment, and ultimately advance in your career.

5. CAREER GUIDANCE SERVICES PROVIDED BY COLLEGE LIBRARIES

Though college and university libraries play only a partial role in providing career information, they are an underused resource. Cooperation between college librarians and career development professionals can strengthen available career information and enhance access, make career development professionals better counsellors, and extend relevant library services to their clientele (Paula Quenoy 2003)

Libraries in higher educational institutions are providing career information to the students but still there is a need to stretch out these services in libraries to reach out and guide the students in their career related needs. The Status of Career Guidance in College Libraries of India after Independence several commissions, committees have been established for improvement of higher education in the country. The career guidance cell in college libraries plays a vital role in providing career information.

- **Career Decision Making:**

The career guidance cell will subsequently help students to decide what academic major will help them to meet their goals.

- **Career Exploration:**

Career services offices usually maintain libraries that contain career-related information. Most maintain websites that direct you to that information online. The career guidance cell should also have a database of alumni who are willing to

discuss their careers with current students.

- **Resume Writing / Cover Letter Writing:**

They often conduct workshops and provide one-on-one sessions during which they critique resumes and cover letters.

- **Job Interview Preparation:**

Career guidance cell usually sponsor workshops to help students learn how to present their self well on a job interview. They sometimes provide mock interviewing sessions where students can practice their skills.

- **On-Campus Recruiting:**

Career guidance cell maintains job listings. They also post part-time job openings for current students. Some also alert students to internship opportunities, although that is sometimes handled by a separate department. Career guidance cell host job fairs during which employers visit the campus to recruit students who are about to graduate.

- **Credential Management:**

Career guidance cell sometimes maintains student files containing letters of recommendation from faculty. They can then forward these letters to potential employers and graduate schools upon the student's request. There is often a mailing charge for sending out these letters.

- **Career Management System:**

Students can access a college's career management system or job portal to look at employment and internship listings, register for workshops and schedule appointments with counsellors and on-campus recruiters. They can also upload resumes into a searchable database which employers can then use to recruit applicants.

- Support and motivation:

A career counsellor also provides essential support and boosts the morale of a student by understanding the kind of requirements. Building the motivational level of a student is necessary for long-term success. In addition to this, career counselling also teaches how to expand your network which in turn enhances emotional support.

6. Carrier Guidance at Govt. First Grade College(Gfgc) Library, Hiriadka, Karnataka

TheGovernment First Grade College in Hiriadka, Udupi District was founded to meet the aspirations of higher education of the rural and economically disadvantaged students of the district. The college is managed by the Department of Collegiate Education, Government of Karnataka and affiliated to Mangalore University Mangalagangotri. At present, the college offers B. A., B. B. M., B. Sc., and B. Com courses to the students. Regarding results, the college has done well over the years, and in a short span of 09 years, we have secured 03 Ranks at the Mangalore University Level Examinations. Being situated away from the hustle and bustle of the city the college provides an ideal environment for the pursuit of learning.

The college library started functioning in 2006 to promote and support the teaching and learning needs of the college. It aims to provide the right information to the right person at the right time. The library resources comprise general collections, valuable source books, rare books, encyclopaedias, dictionaries of various subjects, books related to personality development, and general knowledge books, career guidance books, etc. The library subscribes 15 journals, 45 magazines, and seven dailies.

7. Career guidance resources available in GFGC library, Hiriadka

The library has to maintain the basic collection of career information sources in print as well on the Web. Further the collections have to be updated daily with the help of current affairs sources like newspapers and magazines. The library has to maintain ready reference files with career information for easy dissemination. Books, journals, magazines of career information items are added every year. There are a good number of career-related titles which are of general interest. More than 200 Books like career guidance and personality development, career guidance and counselling, how to face interviews, tips to interviews, how to write resume, communicative skills development, super brain power, general studies, NET/SLET exams, CAT/ICET/AUCET, GMAT, IAS, KAS, PDO, bank special officers Exam, RRB etc. are useful collection about career.

Library receives over 60 periodicals in print. In that, 15 periodicals are related to career guidance information. Some of them as follows

- Employment News

- Guide
- Competition Refresher
- UdyogaVarthe
- SpardhaSpoorthi
- SpardhaChanakya
- G.K Today etc

8. Career guidance activities in GFGC Library

The library has a rich collection of books and journals, which gives information about various careers opportunities and higher education courses. These resources help the students to prepare for various competitive examinations such as NET/SLET, MBA, FDA, IAS, KAS, etc.

- Career guidance books are displayed on display rack and later issued to students
- During the period of display, students are encouraged to consult these resources and reserve them for later borrowing
- The information regarding career has to be filed and motivate students to go through this file.
- The library extended the support of giving Career guidance information regarding various competitive exams like NET/SLET, MBA, FDA, IAS, KAS, bank exams, etc. and encouraged student to apply for the exam
- Motivate students to prepare for their competitive exams and providing proper material for preparing their exams
- One day training program is also organized by the library for the benefit of the final year students to gain awareness about their exams
- College library provide current awareness service and newspaper clipping service for the benefit of users
- Library displays important career related websites in the notice board regularly

- Library subscribe various career related periodicals, which helps students to prepare for their exams
- Guidance in the use of information resources and services, help in locating required documents.
- The library is organizing career literature exhibition, career conferences and spot employment to final year students, old students of the college.
- Organize seminars on interview skills, personality development, communication skills, leadership skill, resume writing, cover letter writing, etc.
- To assist students in the development of skills necessary for decision-making, problem-solving, career and life planning.
- The library inviteresource person in the field of career guidance and counseling to deliver the talk on the importance of career guidance activities.
- Career guidance cell in the library with relevant resources help students choose the right career.

9. Impact of the career guidance program

- This has significantly improved the overall awareness about the career guidance activities in the library
- Book exhibition and display of new arrivals create awareness about library resources
- Many students successfully cleared various competitive examinations like NET, SLET, IPS, KAS, FDA, SDA AND bank exams
- Innovative services of the libraries are appreciated by the principal, staff and students of the college
- The students visit the library has been increased remarkably
- Students find it very useful to know about the higher education courses like M.Com, MBA, MCA, M.A, MSc, etc

10. DISCUSSION

Some discussions have been made here for management, faculty, and librarian, whose coordinated efforts will lead to the effective performance of career guidance programs.

11. Challenges for the librarian

The librarian, as a career development expert, helps the students in choosing a right and suitable career with the help of various tools that are available in the library. He has to understand the needs and behaviour of their users and the point of interactions with the library services. A separate fund is required as the regular budget is not enough. Strong support from faculty and govt. Is very important to practice this. It is also important from the student's side to extend their co-operation. Inadequate fund for organizing conferences and seminars regarding career guidance.

12. Response from the participant and their suggestions

- Career guidance activates appreciated by students
- 47% of the final year students using career guidance resources available in the library
- Students suggested that there should be a separate section for career guidance information so that they can utilize the library more effectively
- To improve the library facility and increase the seating capacity of the library
- Internet service have to be available for searching different web-sites of courses/jobs, to participate in on-line interviews and tests, sending application, bio-data, etc. via e-mail
- A well-equipped Xerox facility is necessary
- Suggested to increase the adequate number of books and periodicals that related to career information
- Suggested that important notifications of govt. Jobs are brought to the notice of students

13. Support from the faculty and government

- College management must make the librarian part of the career guidance cell as its secretary or convener, which will make him/her to take active part in the career guidance activity of the college
- It is necessary to include at least one teaching staff from each subject field in the career guidance cell.
- The government should support guidance and counselling practically by providing and making funds available for all the services in guidance and counselling.
- Suggested to increase the number of books and periodicals related to career information
- Guidance and counselling should be made an integral part of the college program and therefore supported by all concerned.
- A well-equipped reprography facility is necessary.
- Reading room and spacious library with internet facilities.

14. How we can improve this in coming days

Create email address of final year students and important govt. notifications are send by mail.

A well-equipped reference section help the students to prepare for their career exams.Provide free internet facilities to the students.Every month career information guidance will be given to final year students to know about different career opportunities.Collect feedback from the students about career guidance to improve the existing services and resources of the library.

15. CONCLUSION

In the era of electronic information, a librarian has to play different roles as a maintainer, interpreter, trainer, enabler, liaison and advisor." As a quality career resource centre, the library can take pride in the development and well-being of its users. It is extremely important for college library to offer career guidance aimed to help students make more informed and consequently better educational and career choices.Thus, Career guidance is one of the innovative best practice

followed by GFGC library, Hiriadka to provide scholarly information to its users for their better future.

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Career Prospects and Job Satisfaction in Library and Information Science: A Study

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Abstract: *Today there are a number of career prospects in Library and Information Science including corporate sectors and the qualified professionals are employed in various libraries and information Centers of national and international repute in various government, public and private sectors. Trained library professionals can find opportunities for employment both as teacher and as a Librarian. The study attempts to identify the choice of Librarianship as a career; its satisfaction and evaluate the perceptions that affect the job satisfaction based on research survey conducted in Gulbarga and Yadgir district of Hyderabad Karnataka region covering working library professionals. Results reported and conclude with a remark to include Library and Information Science as one of the growing subject on par excellence with other subjects and efforts be made to improve the image of existing libraries and market the prospects of LIS courses to attract the incumbents.*

Keywords: LIS Education, Career Aspirations, LIS Employability, Trends in LIS

1. CAREER PROSPECTS IN LIBRARY AND INFORMATION SCIENCE

Library and Information Science is a noble profession and needs to be marketed to the graduates. Awareness of the LIS course is not, at times, easily determined because voluminous profession arises. It should be stressed that librarianship as a profession deals with human knowledge, with the organization of and access to this knowledge, an area that today stands in the forefront of technological development. Librarianship and information studies are an entire world, complex and rich, in which everyone can find interest. This will motivate them to choose the LIS course. Further, it is very much essential to study about the librarians who working in the institutions of higher education that

what extent they have satisfied with their nature of work, supervisory responsibilities, benefits and rewards. Further, it is very much necessary to know the perception of society towards the library professions and their conditions and status.

The career in library includes areas like library and information systems management, classification/cataloguing systems, bibliography, documentation, preservation and conservation of manuscript, collection management, information systems and technology, research methodology, computer applications, reference, statistics and management, information processing, archives management, indexing, library planning, etc. Library science is constantly evolving, incorporating new topics like database management, information architecture and knowledge management, among others. It is an interesting subject and provides a great opportunity to have the knowledge of wide variety of information sources (Singh, 2013)

Trained personnel in this field can get employment opportunities in wide areas like Public and Government libraries, Universities, professional and other academic institutions, news and broadcasting agencies (Radio, newspaper and Television channels), corporate/ private libraries (Wipro, Infosys, TCS etc.), special libraries (DRDO, NAL etc.) and Contact Libraries (British Library, American central Library etc.) meant for special categories of people. They also can be employed in museum, galleries, archives, and information and documentation centers. They can also aspire to get a job in private publishing houses and other private companies handling with voluminous information. With the requisite, it is possible to choose the kind of library to suit one's interest and background. In Librarianship, designations could be Librarian, Documentation Officer, Assistant Librarian, Deputy Librarian, Scientist (Library Science/ Documentation), Library and Information Officer, Knowledge Manager/ Officer, Information Executive, Director/Head of Library Services, Information Officer, and Information Analyst etc.

Allyson Ard et al., (2006) seek to communicate the career motivations of MLIS students by reporting the results of a survey conducted at the University of Alabama's School of Library and Information Studies. Library administrators and others responsible for hiring information professionals will want to hear the library students' reasons for entering the field, their salary expectations, geographic preferences, perceptions of the job market, and interest in various subfields. However, all librarians should seek to learn more about students' career motivations and professional interests so that they can recruit more people to the profession and accommodate the needs of new colleagues. Taking into account the next generation's career motivations and professional beliefs will empower all librarians particularly those in reference to

boost recruitment by making LIS a more visible and attractive field for prospects. Thus, the present study touches upon one important aspect i.e. career perceptions and job satisfaction of library and information science professionals in Gulbarga and Yadgir districts of Hyderabad Karnataka.

2. OBJECTIVES OF THE STUDY

In the Indian context, perceptions of the public image of librarians of course slowly changing especially after the 6th Pay Commission and looking at the job prospects not only in education sector but even in corporate setup as well. In order to determine the reality, investigator has undertaken this study to determine the career perceptions about Library and information Science professionals mainly to

- Determine the sources of satisfaction and dissatisfaction of Library and Information Science as a career among Librarians;
- Evaluate the perceptions affecting Job Satisfaction with respect to Recognition and salary of the library professionals.

3. METHODOLOGY

Survey method using questionnaire tool has been adopted for collecting the responses from the working librarians working in Pre-University and Degree, Colleges and Engineering and Medical Colleges including school librarians to determine the library science Career Perceptions. The present study is restricted to Gulbarga (now known as Kalaburagi) and Yadgir district Hyderabad Karnataka region. The study populations covered from Bidar district covering 108 librarians.

4. RESULTS & DISCUSSION

Level of Satisfaction for choosing librarianship as a career is shown in Table 3. 52.8% of the respondents strongly agree that their main sources of satisfaction for choosing librarianship as a career are recognition of accomplishment by supervisors and Job security. Similarly 41.7% and 45.4% of respondents strongly agree that their main sources of satisfaction for choosing librarianship as a career are Suitability of working environment and Opportunities to use their ability in work.

Table 1: Level of Satisfaction for choosing librarianship as a career

Sources of satisfaction	Strongly agree (5)	4	3	2	Strongly disagree (1)	Mean
Recognition of accomplishment by supervisors	57 (52.8%)	28 (25.9%)	9 (8.3%)	16 (14.8%)	3 (2%)	3.93
Job security	57 (52.8%)	17 (15.7%)	16 (14.8%)	5 (4.6%)	13 (12.0%)	4.27
Relationship with coworkers and users	2 (1.9%)	4 (3.7%)	18 (16.7%)	23 (21.3%)	61 (56.5%)	3.42
Reasonable salaries	39 (36.1%)	15 (13.9%)	25 (23.1%)	10 (9.3%)	19 (17.6%)	3.33
Opportunities for promotion	36 (33.3%)	18 (16.7%)	22 (20.4%)	10 (9.3%)	22 (20.4%)	3.68
Suitability of working environment	45 (41.7%)	16 (14.8%)	26 (24.1%)	9 (8.3%)	12 (11.1%)	3.97
Opportunities to use my ability in my work	49 (45.4%)	29 (26.9%)	18 (16.7%)	2 (1.9%)	10 (9.3%)	3.21
Better status in the society	40 (37.0%)	10 (9.3%)	14 (13.0%)	21 (19.4%)	23 (21.3%)	3.35
Tension-less job	41 (38.0%)	12 (11.1%)	22 (20.4%)	10 (9.3%)	23 (21.3%)	4.17

However more than 20 percent of respondents strongly disagree pertaining to their level of satisfaction towards Opportunities for promotion (20.4%) and better status in the society (21.3%). As far as librarianship as a tension-less job, 38% of respondents strongly agree and 21.3% strongly disagree to this statement.

As per the mean values, the main four factors of Satisfaction for choosing librarianship as a career are Job security (X=4.27), Tension-less job (X=4.17), Suitability of working environment (X=3.97) and Recognition of accomplishment by supervisors (X=3.93).

Table 2: Factors affecting the public image of librarianship

Factors	Strongly agree (5)	4	3	2	Strongly disagree (1)	Mean
People are not aware about the library science profession and its importance	63 (58.3%)	21 (19.4%)	10 (9.3%)	7 (6.5%)	7 (6.5%)	3.6
Poor quality of existing libraries	47 (43.5%)	16 (14.8%)	20 (18.5%)	5 (4.6)	20 (18.5%)	3.44
Not much high profile profession when compared to others	47 (43.5%)	11 (10.2%)	18 (16.7%)	6 (5.6%)	26 (24.1%)	3.54
Low prestige and social status of librarians	50 (46.3%	16 (14.8%)	10 (9.3%)	6 (5.6)	26 (24.1%)	3.27
Not much distinction between professional and clerical work	41 (38.0%)	14 (13.0%)	17 (15.7%)	5 (4.6%)	31 (28.7%)	3.72

It is found from the table 2 that, respondents strongly agree that the factors affecting the public image of librarianship are People are not aware about the library science profession and its importance (58.3%), low prestige and social status of librarians (46.3%), Poor quality of existing libraries (43.5%), not much high profile profession when compared to others (43.5%) and not much distinction between professional and clerical work (38%). As per the mean values obtained against each factor found that the main factors affecting the public image of librarianship are Not much distinction between professional and clerical work (X=3.72), People are not aware about the library science profession and its importance (X=3.6) and then Not much high profile profession when compared to others (3.54).

Table 3 shows the extent of recognition received in library profession. It is found from the table that more than half of the respondent library professionals agree very much to feel proud of library profession (56.5%) and 251% of them agree moderately. Similarly 41.7% of the respondents agree very much opined that they do receive good recognition for their good job and 24.1% agree to this statement moderately.

Table 3: Job Satisfaction - Recognition

Opinion about	Strongly Disagree 1	Disagree Slightly 2	Agree Slightly 3	Agree Moderately 4	Agree very much 5	Mean
When I do good job, I do receive recognition	12 (11.1%)	4 (3.7%)	20 (18.5%)	27 (25.0%)	45 (41.7%)	4.2
I am proud of my library profession	5 (4.6%)	8 (7.4%)	8 (7.4%)	26 (24.1%)	61 (56.5%)	3.3
Library Profession has better recognition as compared to other profession	18 (16.7%)	12 (11.1%)	22 (20.4%)	32 (29.6%)	24 (22.2%)	2.56
Users of library are never satisfied	35 (32.4%)	20 (18.5%)	26 (24.1%)	11 (10.2%)	16 (14.8%)	2.93
I Presume Library Profession is thank less job	46 (42.6%)	4 (3.7%)	8 (7.4%)	12 (11.1%)	38 (35.2%)	3.64
I am involved in important Committees of college on various occasions	24 (22.2%)	2 (1.9%)	12 (11.1%)	21 (19.4%)	49 (45.4%)	3.7
There is an opportunity to show my talents	16 (14.8%)	7 (6.5%)	14 (13.0%)	27 (25.0%)	44 (40.7%)	3.71
Happiness in the job career improvement	17 (15.7%)	4 (3.7%)	18 (16.7%)	23 (21.3%)	46 (42.6%)	2.95

More than forty percent of respondents agree very much that they are involved in important Committees of college on various occasions (45.4%), opportunity to show their talents (40.7%) and feel happy in the job career improvement (42.6%). However just over 20 percent of the respondents slightly agree that Library

Profession has better recognition as compared to other profession (20.4%) and users of library are never satisfied (24.1%). 35.2% of respondents agree very much that Library Profession is thank less job.

As a whole that main factor for recognition to the respondents under study is when they do good job - do receive recognition (X=4.2), involved in important Committees of college on various occasions (X=3.7) and scope for showing talents (X=3.71). However the other factors which are least are Library Profession has better recognition as compared to other profession (X=2.56), Happiness in the job career improvement (X = 2.95) and Users of library are never satisfied (X=2.93).

Table 4: Job Satisfaction - Salary Benefits

Opinion about	Strongly Disagree 1	Disagree Slightly 2	Agree Slightly 3	Agree Moderately 4	Agree very much 5	Mean
I have been paid adequate salary	29 (26.6%)	8 (7.4%)	20 (18.5%)	11 (10.2%)	40 (37.0%)	3.28
I feel satisfied with my chances for salary increases every year	20 (18.5%)	20 (18.5%)	19 (17.6%)	8 (7.4%)	41 (38.0%)	3.37

It is found from the table 4 that only 37% of respondents agree very much that they have been paid adequate salary and so also 38% of respondents feel satisfied with my chances for salary increases every year. As per the mean values indicate that respondents are satisfied in between range three and four agreeing slightly about the salary benefits.

5. CONCLUSION

Librarians have to change the mindset of the society and themselves with their skills and innovations to build better image of librarianship. This also requires the librarians to be more creative and provide value added services that will result appreciation from users and they start visualizing library profession as very distinctive. Inclusion of LIS subjects at graduation level, marketing the prospects of LIS courses and more importantly improving the outlook of the existing libraries, would definitely change the perceptions of LIS and factors affecting job satisfaction should be ensured for better productivity and innovative services to the users.

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Collection Development Policies in Academic Libraries

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Abstract: *Collection development is the process of planning and building a useful and balanced collection of library materials over a period of years, based on an ongoing assessment of the information needs of the library's clientele, analysis of usage statistics, and demographic projections, normally constrained by budgetary limitations. Collection development includes the formulation of selection criteria, planning for resource sharing, and replacement of lost and damaged items, as well as routine selection and de-selection decisions. The study depicts the collection development policies for academic libraries pertaining to Books, Journals and e-Thesis and Dissertations.*

Keywords: Collection Development Policy, E-Tendering, Library Management

1. Introduction

Library is an integral part of university supporting academic and research pursuits of students, teachers and researchers. University Library has different units like Acquisition Section, Serials/ Periodical Unit, Technical Section, Maintenance, Circulation etc. The success of any library system is recognized not by its building nor by its staff or by its interior decoration, but by its collection. In fact the future generation will blame us or praise us for its collection. In a library the information available in all forms such as books, serials, electronic media etc., are all important as far as user is concerned. Any collection both in quantity and quality if not properly and constantly revised and updated will cease to be a live collection. Therefore the collection of the library should always be geared to the needs of

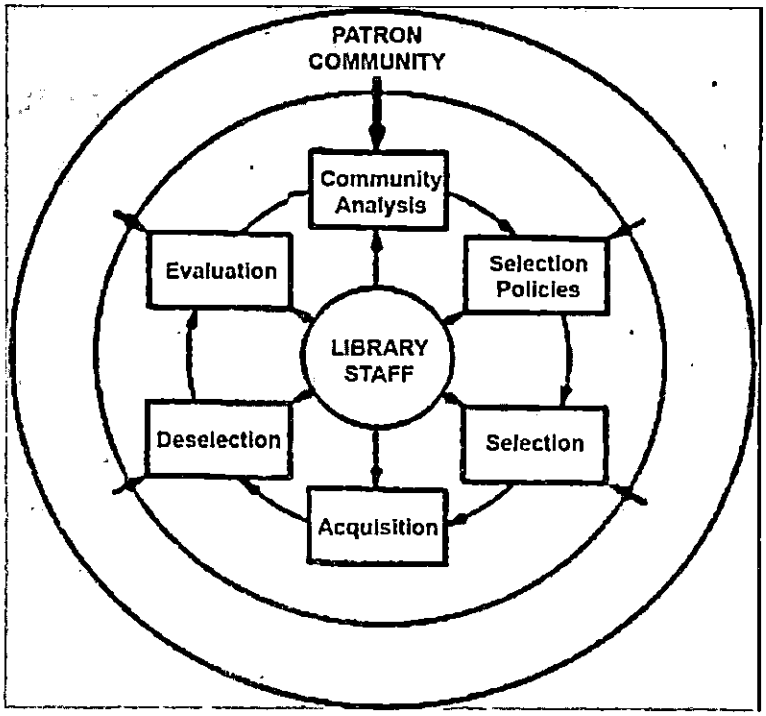
users it sets out to serve and be planned in accordance with well-defined policies and procedures.

In this changing landscape of collection development of various information sources and emergence of transparency act and also concept of e-tendering poses challenges for librarians to have a strong and documented collection development policies for books, Journals, E-Resources etc.

Reitz (2013) defines Collection Development Policy as:

`A formal written statement of the principles guiding a library's selection of materials, including the criteria used in making selection and de-selection decisions (fields covered, degrees of specialization, levels of difficulty, languages, formats, balance, etc.) and policies concerning gifts and exchanges. An unambiguously worded CDP can be very helpful in responding to challenges from pressure groups i.e. faculty and administration'.

The success of Collection development, depends on various elements viz., community analysis, need establishment, policy formulation, selection, acquisition, processing, organization, preservation, conservation, evaluation, weeding, resource sharing etc,. The Collection Development Policy model suggested by Evans, G.E. and Saponaro, M.Z. (2005 & 2012) is depicted below.



2. Literature Review

The existing studies on collection development particularly in the foreign and Indian context are highlighted. Mittal [1963] documented the problems involved in acquiring serials in Indian universities. Basu [1973] highlighted the practical problems of periodical acquisitions particularly non-receipt of issues due to mis-delivery and/or loss in transit. The problems faced by Indian librarians in acquiring current periodicals were discussed by Ghani [1977], Agarwal [1975], Basu [1975], Chopra [1977], Gidwani [1971], Kapoor [1972] and Shah [1976]. Bavakutty [1991] has observed that journals are acquired in Indian libraries through subscription from publisher, agents, Government agencies, learned societies, exchange and on gratis. Venkatesan and Krishnan [1979] felt that, direct method is better among various methods of acquisition of periodicals. DasGupta [1984] preferred agency system, as direct method has more problems compared to subscription through agency. Rosamma [1983] attempted a comparative cost benefit analysis of the two systems of subscription to periodicals (direct and subscription by agency) based on the experiences of Calicut University Library and Kerala University Library and observed that direct subscription system is more efficient and economical. Aldi and Tadasad (2012) studied the scientific serials developed from 2004 to 2008 in six universities in Karnataka and thereby analyzed the common serials in these universities to know the extent of duplication and also to suggest necessary need for consortia. The study reports that the number of scientific serials subscribed independently in these six universities accounts to less than forty percent.

Stuart Hunt (2017) explores theoretical approach to collection development and content strategy derived from literary theory to contextualise debates. It uses current examples from collection management within UK academic libraries. It suggests that collection development is not exclusively a library practitioner activity but needs to be considered within a wider context that takes account of multiple strands of collection selection and management. Collection development cannot be considered in isolation but alongside collection management and in relation to content strategy. The study by Ghalib Khan and Rubina Bhatti (2016) found that several factors have a direct bearing on the way in which collections are developed and managed in the academic libraries. These factors include goals of collection development and management policies and procedures, user needs, collection development policies (CDPs), collection development budgets, collection evaluation to determine the strength and weaknesses of various subjects in the collections, selection of reading materials, formats in which materials are selected, the issues of access versus ownership, cooperative collection development, resource-sharing programs and legal issues in collection

development and management.

Tony Horava and Michael Levine-Clark (2016) provided a snapshot of some major collections-related trends and issues in current academic libraries today. These include using collection development policies; demand-driven acquisition (DDA) models; big deals; using the collections budget; rationalizing legacy print collections; stewarding local digital collections; and demonstrating value. These results are quite current and will enable academic librarians engaged in collection development and management to compare their current policies and practices with what is presented here. The results provide a current snapshot of the ways in which selected libraries are coping with transformative challenges and a rapidly changing environment. Suzanne Mangrum and Mary Ellen Pozzebon (2005) finds that virtually all libraries do an excellent job of addressing the traditional elements of collection development. About half of the libraries mentioned electronic licensing issues in the policy, but most of those were general statements.

3. Collection Development Policies: A Plan of Action

Based on the experience of working in University Libraries, action plan in the process of building collection development policies for books, Journals/ Serials and Electronic Thesis and Dissertation (E-Tendering) checklist is highlighted blow. This is only guideline depending upon the feasibility, the procedures may be modified or updated.

4. Policies, Procedure and Procurement of Books

STEP-I (ALLOCATION/SANCTIONING THE FUND)

- Budget allocation- by the University
- Ascertain receipts in Non plan, plan and UGC head of account
- Proposals moved by the Library to utilize the funds
- Approval of the Library Advisory Committee to utilize the funds for books
- Obtain Administrative approval for the amount allotted for.

BOOKS

- To all P.G. Departments
- To all P.G. Centres
- SC/ST Book Bank (P.G. Depts + P.G. Centres) and

STEP-II (BOOK PROCUREMENT AND PROCESSING)

- After obtain administrative approval for the amount allotted P.G. Depts/P.G Centres initiates action to send the list of books for procurement to the Librarian GUG.
- Chairpersons of the Depts/OIC P.G. Centres send books list; selected books out of books received on approval basis from specific firm/s; Books to be procurement on standing order basis to the Librarian with recommendations of the Department Council Resolution Number and date.
- List scrutinized at books Ordering section in Library considering fund allotted to respective Department/PG. Centre, availability, demand, priority etc.,
- Supply Orders placed by the Librarian to the firms with a minimum of 15 discount or higher discount if offered to Educational Institutions. Terms of supply of books and conditions approved by the GOC/GFR. Exchange Rates for foreign origin books as per the GOC circulars issued from time to time.

5. Procedure for Procurement of Scientific Serials including e-journals

The Library must be conservative in adding periodicals whose cost may triple in three years and so careful consideration is important when making a request for a new subscription or renewal of scientific serials. The procedure for Development of Scientific Serials in an university setup is suggested as under:

6. STEP-I (SANCTIONING THE FUIND)

- Budget allocation-approved by syndicate/Academic Council
- Availability of funds ascertained depending on receipts in Non plan and UGC head of accounts.
- Proposals moved by the library to utilize the funds.
- Considering the funds available, proposal to allocate/sanction the amount for Books, Journals, SC/ST Book Bank moved by the Library
- Administrative sanction orders issued for the amount allotted for Books

- To all P.G. Departments
- To all P.G. Centres
- SC/ST Book Bank (P.G Depts+PG centres)

7. STEP-II (PROCUREMENT)

- Journals and Annuals recommended by the Departments
- List approved by the Library Advisory Committee.
- Sanction Order issued to the Librarian for the amount allocated towards the renewal of subscription of journals/ CDROMs etc.
- Advance payment to be made for subscribing Journals, CDROMs, Year-books, Serials, Annuals, J-GATE, e Journals etc.,
- Indian Journals subscribed directly from the Publishers as per GOC.
- Foreign journals, e journals procured through Distributors Subscripti9on Agents as per GOC/GFR terms and conditions and exchange rates approved from time to time.
- Journal subscription/renewal is continued until concerned Department recommends canceling the subscription.
- Secondary Journals, CDROMs Yearbooks, j GAYES JCCC, annuals etc are common to all departments.
- Action for subscription/renewal starts during September every year and subscription payment made normally by November-December.
- Bills/Invoices received from firms/Publishers for advance payment.
- After making necessary records based on the sanction the bills sent to Finance Branch to release payment through Bank Demand Draft.
- The Finance Section sends the Bank Drafts to the Librarian for making necessary entries and sends the draft to the concerned.
- On payment, receipt of journals watched and reminders sent at regular intervals for the gaps/non-receipt on completion of volume journals are bound.

8. Evaluation of Scientific Serials

A Serials Selection Committee comprising librarians and faculty members has to be constituted annually to review subscriptions in terms of general guidelines, increases and monetary fluctuation and binding. Departments, in collaboration with their respective librarians, must annually evaluate serials currently subscribed to and request, where necessary, cancellation in good time and all this has to be documented in collection development policy. The factors to be considered in evaluating development of scientific serials are

- Relevance refers to the extent to which the title supports the needs of faculty and scholars in an university learning, research and teaching programs
- Cost – cost effectiveness and discount structure and its utility as well.
- Quality with respect to authority of journal, its publisher, content, peer reviewed nature and currency of publication
- Format i.e. Print or electronic format or both has to be decided.

9. Procedure for E-Tendering of Electronic Thesis and Dissertations/ Software

- One should register e-procurement portal and should have key for uploading the e-tender contents. Then, prepare for
- Eligibility Criteria
- General Terms & Conditions
- Technical Bid Form
- Commercial Bid Form
- Evaluation Process
- Payment
- Checklist
- Technical score evaluation is very important in addition to the regular process of e-tendering to have better company. Some of the facets of such process which can be included comprising of score of 100 points are given below.

- ISO certification (27001:2005 certificate)
- Annual turnover
- Minimum Number of years of experience
- Similar project experience
- Min. 2 projects with total order value
- Detailed presentation - profile, experience, approach, methodology & timeline

10. Conclusion

It is needless to mention that the process of collection development has to be systematic and judicious, so as to maintain a balance between available resources, user needs and quality collection. This necessitates a planned approach and assumes significance in the light of economic recession and financial limitations as libraries are service- oriented institutions. Although the results indicated that half of the university libraries have written collection development policy, but it is not well documented in the comprehensive manner. Hence, the Library, in carrying out collection development activities should develop well documented policy to adhere to the principles expressed in the collection development policy. Especially for e-resources, one should be very careful and devise authenticated and well documented collection development policy.

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Collection Development: Strategies, Issues and Challenges

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Abstract: Now a days due to tremendous growth of Knowledge, every year Millions of Books, Journals, Conference Proceedings, Research papers are published. It is difficult task to manage Collection Development due to which arose the concept of collection development. Collection as defined by the Webster Dictionary is a "publication containing a variety of works i.e. Books, Journals, Conference Proceedings, Technical papers etc. ". However, in the connotations of library science, the term collection refers to book selection, library acquisition, building the collection development. Collection development is one of the most challenging and imaginative processes of library profession, where by library staff acquires a wide verity of documents to meet the demand of its users. "The steps involved in collection development include user's analysis, selection policies, acquisition policies, resources sharing, weeding and collection evaluation and management". Interaction between library staff and academic community is unavoidable at each of the above stages for an effective procedure of collection development process.

Keywords: Collection Development, Planning Strategies in libraries, Collection Development Policies E-resources

1. Introduction

Collection of print and e-resources Process plays dominant role in the libraries. Libraries have to assess user needs and have to select the relevant resources. An evolving concept of library collection management devised to answer changing reader demands on library a specialization in library Profession , it was born out of professional need to hire a specialist to identify and locate needed resources and make sure that the library was effective in getting the material it needed. Users do not simply need access to those books catalogued, preserved and available within an institution; they demand bibliographic access to materials outside the country, and often outside their specific knowledge. It is therefore within the province of

collection to manage these processes and continue to serve readers within such an extended framework. Collection development has always been the basic concern of all types of libraries with approaches in each library reflecting institutional goals, user needs and the library's role within the institution.

Planning and Decision Making

Objective of the Institutions

Quality of the Collections

Financial Resources

Collection Development

Publishers/ Book Sellers Catalogue

Book Reviews

Institutional Websites

E-Subscription Agencies

Library Networks/Consortia

Collection Analysis and Evaluation

User's Demand

Currency of Information

Usefulness of Collection

Cost-Benefit Analysis

Impact of IT on CD

Non-Print/ Electronic Resources

Microfilm, Microfiche, Video Cassettes,

Databases-Bibliographic/ Full Text

Internet Resources

Benefits of Electronic Resources

Equal and Remote Access

Better Quality of Services

Lower Cost and Less Time

Increasing User Demand

Eliminating Space Problem

Growth and Popularity of Internet and Digital Library

Internet Resources (E-books and E-Journals, Library Catalogues

Multimedia Resources (CD-DVD)

Access, Content and Cost

Librarians as Content Managers

Collection of Information

Organization of Information

Dissemination of Information

Collection Development to Content Development

Development of E-Resources

Reputation and Authority of the Publisher

Formats of the Available Contents

Access Facility

Currency of Information

Authenticity

Periodic Updating

Cost

CD-Strategies

Collection Development Policy

Evaluation of Collections

Weeding Out Policy

Library Networks/Consortia Membership

Financial Resources

Key Issues

CD Policy for College and University Libraries

UGC and NAAC Initiatives (Guidelines and Quality Indicators)

Usefulness of Library Networks/Consortia Membership

Ownership vs. Access

Challenges Ahead

Collection Development to Content Development

More and More Use of Multimedia Resources

Growth and Popularity of Digital Library

Developing Information Skills

Role of LIS Professionals in 21st Century

Redesigning Appropriate Strategies for Selection and Use of Emerging Technologies

Uploading rather than Down Loading

Review the Mandate or Mission of LICs in Emerging Scenario

Refocusing the Information Requirement of the Users

Revamping the Activities and Services by Using ICT

Best Practices

Developing Appropriate Physical (ICT Infrastructure),Human and Financial Resources)

Continuing Education Programmers

Information Literacy

Emphasis on Content Development

Access Facility and Compatibility

Timeliness and Relevance

Cost

Copyright/IPR

2. Conclusion

The advent of digital libraries at the turn of the twenty-first century has been mired with several aspects including the development of appropriate technologies, issues related to storage, rights management, and so on. Digital libraries, along with associated technologies and related issues, are still somewhat in infancy with very few fully established digital libraries the world over. The concept of digital libraries itself varies greatly with several known definitions. With digital library technologies maturing, storage capacities increasing and digital access improving, the focus needs to be crystallized on content for digital libraries. However, research

on digital libraries so far has focused on the containers and conduits rather than the contents. A recent review of digital libraries in India found that out of 63 studies, only two have discussed about content in comparatively greater details.

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College Library in ICT Era: Challenges and Solutions

Anila S. Bhardwaj

Abstract: In the present 'information age' information handling activity has become so prominent that a library is being called "Library and Information Centre". ICT is having a huge impact upon libraries and librarianship and it solve many problems of users related to their various information search. Library Plays Multi-dimensional role in the society and it is a warehouse of knowledge. It is just like a resource centre as well as mediator between information and users. In the present days scenario information and communication Technologies (ICT) have made a tremendous impact on the functions of the college libraries. The digital age has seen a definite change in the role of the library and services expected of it. In particular, users expect quick, one stop service to cover a range of needs. Present paper is the introduction to the role of college libraries and the impact of ICT on them in the present context and also the challenges faced by the college libraries with knowledge about best practices in library environment and use of ICT in library services.

Keywords ICT, College Libraries, Book Exhibition, E-resources, Library Software

1. Introduction

The library is the primary and significant requirement for any educational institution it is the centre of any academic setting. Libraries supplement the instructional work of classroom and carry forward the ideas of education. Real education can only be achieved through the libraries. Thus the libraries are the providers of informal education, guiding the learners to search vast range of material available the role of college library is to support the teaching, learning and various other day-to –day activities. The libraries are gradually brought recognized for their academic services and they are occupying prominent position in educational programmes, through the World.

2. Functions and Objectives of College Library

Library plays a very important role in the growth and development of the society and it is an organization having a properly organized collection of reading material and other

sources of information.

- To introduce students and teachers to vast resources of knowledge.
- To guide the students and teachers to make proper use of their leisure time.
- To promote and create reading habit.
- To help the students to develop critical thinking, judgments and appreciation of reading materials.
- To shape the career of young student by providing right information.
- To provide latest collection of the text books, course related materials and Journals on print and electronic media.
- To maintain good collection of reference books, magazines, newspapers and Internet facility to provide wider access to information.
- To train the students in the use of library catalogue, reference sources, and net based Information access.

3. Role of College Libraries in ICT era

The library is the center of knowledge, major source of information for different type of users. Each and every library has the best innovative ways and practices, which make your library perfect and users friendly and epicenters of attraction of students. Library is the major support for the entire range of academic activities on an educational campus.

College library is the pulsating heart which is to quicken every activity which goes on upon the campus, it is the easily accessible mentor to which every alumnus should look for guidance and it is a beacon light whose rays should illuminate more and more the path of those leaders of men who are entrusted with the conservation of equality of opportunity and the solution of problems of civilization that assessment a greater and ever increasing degree of complexity. The library organizing the library resources in a systematic way, but also feeds the intellect of the students, encourage the researchers of the faculty and thus serve the teaching and research needs of the faculty.

The areas where best practices can be adopted and implemented in a library and information environment are: -

* Library organization and management

* Usage of library services

* Automation and use of technology

4. Challenges faced by college library

* Explosive growth of Information and documents

* Increased cost of document and information materials.

* Increase in user's information needs

* New role of the librarian and grater responsibilities

* Latest techniques and concept in handling of Information.

* New electronics information environment.

* Creation of databases and its security.

* Marketing of library and information services.

The library and information center of an institution play a central role in facilitating dissemination and creation of new knowledge. In the present learning environment, the library and information center are learning resource has taken up increasingly more academic space and time in the life of the user. Thus it is time to identify and adopt the new ways that will lead library and information center to improve their process and activities, there by optimizing the resource utilization and delivering high quality, and value added services to their users.

5. Best Practice Adopted in college library

* Books exhibition program

* Making of a pathfinder to the library.

* Developed of a webpage for the library.

* Computerization of library with standard automation software.

* Inclusion of sufficient information about the library and resources in the college magazine.

* Arranged information literacy programme for college students and Staff.

* Provide the current awareness service to user.

* Current content services of journals. Sending scanned content page of journals to users, this service is save the time of the user and also increases the utilization.

* Provide Internet facility to all user.

* Displaying new arrivals and circulating a list of these arrivals to all academic departments.

* Organizing book talks by authors and readers.

* Instituting annual 'Best user award' for students.

* Conducting user survey's periodically.

* Establishing linkage with other library and avail free services.

* Staff users meet organizing student and library staff round tables, with faculties coordinators.

* Creation of digital repositories for articles publications thesis, dissertations, seminars/ conference papers, course ware etc.

* Development of electronic environment of the campus and encouragement to e-deliveries.

*Building a network between the college libraries so that they can share required information.

*Developing virtual presence conducting exhibitions, demonstrations lecture on current issues, audio visual clippings and graphs.

6. ICT requirement for Accessing Electronic Resources

For accessing the electronic resources a minimum level of hardware and software are required.

* **Hardware Requirement** Most e-resources subscribed by the consortium are web based, subscribing institution should have a full feature and configured system with high speed internet connectivity to get better access to e-resources.

Most publishers prefer to make their e-resources accessible on campus network of subscribing institutions on dedicated IP addresses/range of IP address. Subscribing institutions should have campus network spread over their entire campus so as to maximize the usage of electronic resources.

Moreover, institutions subscribing to e-resources should have sufficient number of PCs so that faculty, researchers and students get easily access the available e-resources.

* **Minimum Software Requirement** Most electronic resources offered through the consortium requires an internet enabled multimedia PC equipped with an internet browser like internet explorer or Netscape navigator as their clients. With the availability of sufficient software e-resources can be accessible easily.

* **Internet Connectivity** Institutions should have 528 kbps (preferably 2 mbps or more) connectivity to internet for improved access of electronic resources depending upon the total population of users.

E-resource Management Tools and Techniques

*** Library website/Portal**

Majority of libraries delivering E-resources through their website/ portal. The library professional are creating list of the Journal Titles with URLs and organising e-resources according to alphabetical and/or subject wise for easy access. It is considered trouble-free tools for the library professionals and as well as library users.

*** Library OPAC (On line Public Access Catalogue)**

This is a tool which offers a single platform /gateway for the access of all the available libraryresources. The users can access information regarding all the print as well as electronic resources through the OPAC. Few libraries also develop a database related to article indexing, and it can also be accessed through OPAC.

*** Library management software**

It is observed that the various software available in the market for the e-resource management like ERMSS, Libsys,Troodon, Netlib etc. These software facilitate to management all kind of information related the e-resources.

7. Role of the LIS Professionals in the Changing Environment

Emergence of Information and Communication Technologies (ICT) offers lot of opportunities to redefine how information are communicated to the users wherever they are. As information systems increase in complexity and new resources like digital resources or electronic resources continue to spring up, librarians are becoming indispensable counselors in the electronic environment. They are called upon to assist users in identifying,

evaluating sources, and to serve as true advisors and teachers rather than storekeeper of collections.

Librarians need to see themselves and their libraries as providing bridges to the past and gateways to the future. They should aim to provide the following services to the users:

* Develop knowledge resources focused on patron's needs;

* Organize information resources in print and non-print considering the changing needs;

* Provide Human and technologically moderate access to information;

* Design and develop innovative library services;

* Build strong Network for effective dissemination of information;

* Provide continuing education and training; and

8. Conclusion

Best practices is the way for enhancing the existing function and help in effective implementation or use of the process. The best practices is an attitude, an approach of a philosophy based on the desire for continuous learning and improvement use of technology is designing and delivering the information products and services is always made good results.

Automation of all in-house operations in academic libraries with bar coding user identifies and Web-OPAC facilities is a best practice in totality of library services. Hence adopting new techniques and tools in imparting users education may be of best practices in extent of use of library services.

9. Author's Suggestions

Based on the findings of the study and experience of the author the following suggestions are put forward to improve the best services in the library:

1. Proper infrastructure in the library are also required for the use of internet and e-resources.

2. Existing staff should be deputed for extensive hands on computer training in the libraries not only for the computed application but also for the basic hardware and software training so that most of the technical problems will be solved including the major technical problems of daily routine which will no longer be headache on the part of library administration, thereby making library independent of such minor problems.

3. Instead of only giving the user education programmed in the session starting period, it should be held at least thrice a year because there is a need to create more awareness of the e-resources among the users.

4. There should be one permanent staff member to help the users to maximize the use of all the e- resources available in the library.

5. Software should have multi lingual support system and integrated for effective searching.

6. The UGC should allocate more funds/grant for modernization of these libraries as per new electronic era.

7. The level of computers access and internet connections in the libraries revealed a need for improvement with regard to connecting to a campus network, as internet use is maximized by availability of networks.

8. Library should increase the number of computer systems and these systems should be of latest available configuration.

9. Library should increase the data speed of internet connectivity.

10. College libraries should purchase more e-resources related to the syllabus so the students and faculty can get the more information in a minimum time.

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Embedded Librarianship: Way forward for information enabled world

Choudhary, Pravin Kr., Shokeen, Ashu & Choudhary, Prabhat Kr

Abstract: The information culture is changing be it processing, products or service request from users. The information suppliers and their products lines are also tempting the user communities to switch over to alternate world of information channel. The job market of Library and information professionals are continuously been encroached by different users. The recent study and news from national news channel mentioned that job of librarianship is further going to be diminished in coming six years time. Now the point in context is the need to explore the embedded librarianship concept and best practices in order to revive the very basis of Library and Librarianship. The present paper dwells in the relevance and status, building blocks and best practices of embedded librarianship. It also discusses new role and responsibility of professional as embedded librarian. The new opportunities for embedded librarianship are also discussed.

Keywords : Embedded Librarianship, Information Enabled World, Librarianship

1. Introduction

The term embedded librarian was coined by Barbara Dewey in 2004. Many researchers have defined the embedded librarian. They defined an embedded librarian as librarian activities. The most comprehensive of such definition was given by Shumaker & Tally 2009. It focussed "on the need of one or more specific groups, building relationship with these groups, deploying a deep understanding of their work and providing information services that are highly customized and targeted to their greatest need".

The term embedded librarianship is also used to describe the work of an academic librarian who participates in an academic course on an ongoing basis, teaching information literacy skills; work of librarians in a research institute; or corporation whose offices are moved to their customer groups, so that they can work more closely with the members of those groups. Embedded librarianship takes a librarian out of the context of the traditional library and places him/her in 'on-site' setting or situation that enables close coordination and collaboration with researchers or teaching faculty.

The use of IT enabled system and services is furthering the scope of embedded librarianship. It is also challenging the traditional information services and opening new ways to serve the client. Embedded Librarianship is an expanding trend and a term used to cover a range of initiatives and service concepts. The development

of new digital information resources and related economic and administrative changes have made embedded librarianship critically important to librarians and information professionals.

2. How and where are Librarian Embedded

One of the highly popular model of Embedded Librarianship is embedded in the institutional course management system(CMS). Embedded in the CMS require comfort with the technology and with the pedagogical principle of online learning environments.

Librarians working with upper divisions often involve in-depth participation in short-term projects, aiding the team in their searches, literature review, grant preparation, data curation or other specialised information aspects of the project.

Some librarians are embedded in departments as liaison. They often work as a finders of information, organisers of information, and taxonomy creators. Embedded within departments, provided in-depth knowledge of the users of library services, along with potential isolation from other librarian. It involves a high degree of specialised, co-location and shared responsibility.

This is generally takes the form of asynchronous visits from the librarian to course discussion boards along with embedded supplemental material (i.e. podcasts, slide shows, videos, worksheets) for research projects. The benefit of embedded approach are obvious in the huge growth of online learning in higher education as the traditional one-shot library. Another benefit is that when a librarian answers questions and delivers tips in an online discussion board, all of the students in class can benefit from the information at the point of need.

3. Embedded Librarianships : building blocks

The idea behind embedded librarianship model is to enable librarians to demonstrate their expertise as information specialists and to apply this expertise in ways that will have direct and deep impact on the research, teaching, or other work being done. Through embedded librarianship, librarian move from a supporting role into partnership with their clientele, enabling librarians to develop stronger connections and relationships with those they serve.

Regardless of the nature of the embedded librarian model employed and the type of research activities librarian seek to engage in, becoming an embedded librarian can be challenging prospect. Removing yourself from the comfort and

familiarity of the traditional library context into an environment with new context into an unfamiliar environment with new responsibilities, although rewarding, can be a daunting task initially.

There are four keys to embedded librarianship as given by David Shumaker:

- Build strong relationship with members of specific information user group.
- Focus on understanding their work and information needs.
- Share their goals and actively contribute to the achievement of those goals.
- Become an integral and indispensable member of the group.

These building blocks are interrelated and need to be addressed in precisely that order; skipping any steps cannot flourish for embedded librarianship support from the organisation's leadership is critical. It is one the strategy for strengthening and refocusing the library's presence within an organisation and demonstrating librarians' added value.

4. Strategic consideration for the Embedded Librarian

- Become team player: An embedded librarian need to have an understanding of how the team will operate and perform its duties. This includes knowing what your roles and responsibilities also understand the roles of the other team members.
- Getting support from organisation and colleagues: working directly with clientele outside of the library is a change for the embedded librarian. To be successful embedded librarian need to solicit the understanding and approval of library administration and your colleagues. It is required to make them understand that embedded yourself in team outside of traditional boundaries of the library is not taking away day job, but so much as redefine it expanding the influence of the libraries.
- Generating Entrepreneurial Mindset: To be successful as embedded librarian depends how your ability to become entrepreneurial in your work as librarian. The characteristics of entrepreneurial mindset require you to become proactive in identifying and pursuing opportunities, through attending university seminars and talking with speakers for example, and being able to "sell yourself" and what you can contribute as a librarian towards new knowledge-based practices or products.
- Accept Risk: Remember that risk is necessary for change. To understand what your and your organisation's risk tolerance is will be an important activity and could directly impact your effectiveness.

- Linking Library science to other disciplines: A key component of becoming an embedded librarian is being able to explain your knowledge, skills and expertise to others in ways that are relevant and meaningful to them and their situation. This is time taking task and may take much time, effort and repetition.
- Developing Trusted Relationships: At basic level , the embedded librarianship model rests on the interplay of talking and listening with users that you serve. The primary objectives behind talking/ listening/teaching/ learning are to construct an understanding of researcher needs and librarian capabilities and to build trusted relationships.
- Move away from your comfort zone: Embedded librarianship requires that you leave the relative comfort and safety of the traditional environment and venture into unfamiliar territory. In navigating these uncharted waters, do not be afraid to ask for help when you need it. It also helps to develop a network of trusted colleagues to confer with when things are uncertain. The changing nature of research in the 21st century means that faculty are also confronting new and unfamiliar situations themselves.
- Think Out of the Box: At this point we recognise the need to re-examine librarian roles at our institutions and adapt our work to a new age of research and scholarship. The goof planning is important but actions taken by you and your library in pursuing opportunities for embedding librarian will count more than words.

5. Implementing and Embedded Project: best Practices

Careful collaboration and thoughtful implementation plan is required while building an embedded instruction program.

- Working with known partners and with small pilot projects is a smart way to start the project.
- Establishing partnerships with other campus stakeholders will also benefit a new embedded project.
- When developing the embedded project, it is a good idea to take a snapshot of your campus needs and goals. The academic mission and institutional priorities of your institution should guide your planning efforts.

6. Tasks and Duties of Embedded Librarian:

A survey conducted by "3 Greeks and Law Blog" earlier this year, respondents identified the following tasks and duties of embedded librarians:

- Research
- Product assessment and recommendation
- Cost effective research education
- Analysis and summarization of research findings
- Development of contribution to current awareness streams
- Research project management (schedules, checklists, calendars, best practices, etc.)
- Competitive intelligence
- Knowledge management and
- Database development/Management.

7. New Opportunities for Embedding Librarianship:

With rise of research studies following new opportunities are coming up for embedded librarianship.

- New Learning objects: The rise of online video and free screen casting tools are driving the creation of many more learning objects by librarian.
- Social Networks appeal to course instructors: as a way to create online learning communities where students spend times. Librarians are embedded in environment like Twitter, Facebook, Class Wikis and more.
- Supplemental synchronous instruction and reference interaction in asynchronous learning environment is gaining traction as well. The tool like Google voice are being used by embedded Librarianship to provide personal access via phone and text, setting office hours to govern their availability and cloaking their telephone numbers.

8. Conclusion:

The role of Embedded Librarianship continues to evolve to keep pace with changes in organisational changes & strategies and librarian continue to seek out new ways to create value for the firms. As embedded projects move forward, it brings lessons and improvements and revisions to your approach. Embedded librarianship is one way to help the library remain and be perceived as relevant, further strengthening librarians' positions as key players within the organisation The growth of online learning and the ease of creating learning objects make this

a great time to experiment with embedded librarianship at your institution.

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Energy Efficient Green Buildings: a Move to Embrace Nature

Dr. Dharam Kumar & Dr. Pardeep Rai

The Library as defined by Dr. S R Ranganathan is the combination of three elements i.e. Books, Users and Staff. Primarily it seems alright but later the library scientists added forth element 'building' as essential component of library. The building is considered an integral part of any social, cultural, religious and educational institution. It is a body which serves as medium of transformation of absract thoughts into physical form. The nature is the most beautiful gift to the mankind. The Human body is made of basic five elements i.e. fire, earth, water, air and space. Our survival and quality of life depends on a healthy natural environment. Like human body the buildings also have a kind of balance of basic five elements, if this balance is disturbed in any form it creates havoc on those who occupy it. It becomes the eternal source of diseases and difficulties.

The libraries are lifelong learning centres for people of all ages in local communities. They are not onlly store house of knowledge, but are also important information resources for raising awareness about social, religious and environmental issues.

The great library buildings are the outcome of architectural excellence. They have the best combination of systems of air, water, heat and space. Thus architecture is the process and product of designing and constructing bulildings. It works with a certain indefinable combination of design quality and external circumstances may become cultural symbols and/ or be considered works of art. The definition of Architecure is disputed and the people have defined it in their own. Some call it ' the art and science, or the action and process, of designing and constructing buildings'. The others say that ' the expression of thought in building' or 'a group or body of buildings in a particular style'.

On the basis of specific ways of buildings, characterised by the features such as form, method of construction, materials and regional character it may be classified into the following categories: Modern Architecture, Post modern Architecture, Deconstructivism and Brutalism. The scope of architecture may be subdivided on the basis of purpose and origin as Religious, Responsive, Sustainable and Vernacular architecture.

The Sustainable architecture or Green Architecture is architecture that seeks to minimise the negative environmental impact of buildings by efficiency and

Windows are placed to maximise the input of heat-creating light while minimising the loss of heat through glass, which is a poor insulator. In the northern part of the world the large number of windows are placed to collect the direct sunlight. The north-facing windows are avoided. The windows with double or triple glazed insulated windows with gas filled spaces and low emissivity coatings, provide much better insulation than single pane windows. The solar shading device is used to prevent the excessive heat so that the cooling need may be decreased. Some trees and vegitation are also planted to have a balance of heat and cold in the building. The techniques of keeping the building hot or cold depends on the climatic conditions the building in cold zone requires the heat management and in hot zone requires the methods consuming less and less energy to keep the cool temperature in side the building.

6. Renewable Energy Generation :-

Solar Energy : The solar energy can be produced by the installation of photo voltaic solar panels. The Electrical output of a solar panel is dependent on orientation, efficiency, latitude and climate. The solar gain may vary even at the same latitude. The typical efficiency for commercial available PV panels range from 4% to 28%. The solar panels can produce adequate energy if aligned within 30 degree of south. In summer and winter the PV panels are positioned at different angles to get the maximum energy output accordingly.

Wind Energy : The use of wind turbines is also very popular means of energy production. The under size wind turbines are somehow costly rather than the larger wind turbines relative to the amount of energy they produce. Wind turbines begin operating when winds reach 8 mph, achieve energy production capacity at speeds of 32 - 37 mph and they are shut off to avoid damage at speed exceeding 55 mph. The energy potential of a wind turbine is proportional to the square of the length of its blades and to the cube of the speed at which its blades spin. The small wind turbine can be installed at the roof top of the building. It can generate 25% of required electricity of a domestic household. The wind turbine are usually 7 feet (2 meter) to 25 feet (8 meter) in diameter and produce electricity at a rate of 900 to 10, 000 watts at their tested speed.

Solar Water Heating: Solar water heaters, also called solar domestic hot water systems, can be cost effective way to generate hot water. The solar water heaters are of lower capacity and higher capacity. In higher capacity solar water heater almost 80 to 100 gallons hot water can be produced. In these water heaters the flat Plat and Evacuated tube techniques are used to heat the water. The evacuated-tube technique is more effective than the flat plat technique.

7. Sustainable Building Materials:-

The following recycled sustainable building material can be used in the building construction, these are blown - in fiber glass insulation, sustainable harvested wood, Trass Linoleum, sheep wool, panels made from paper flakes, baked earth, clay, wood fibre plates, stone and bamboo etc. The sustainable architecture also incorporates the use of recycled or second hand materials. The attempt is made to retrofit old structures to serve new needs, it avoids the un neccessary creation and consumption of new goods.

Lower Volatile Organic Compounds are used for insulation in the building rather than the other insulation material which may contain toxic materials such as formaldehyde. These low emitting material is healthier to the occupants of the buildings rather than the Volatile Organic Compounds which may cause sick building syndrome type symptoms and sensory irritation. The standards for sustainable building material is still debatable and in-consistent with the LEED certification. The builders, architects are giving importance to the energy efficiency and the insulation of building helps to save the enrgy and makes the comfortable indoor environment in the building.

The Insulation is rated in terms of thermal resistance called ***R-value*** which indicates the resistance to heat flow. The higher the R-value, the greater the insulating effectiveness. The R-value of thermal insulation depends on the type of material, its thickness and its density. R-value is the reciprocal of the time rate of heat flow through a unit area induced by a unit temperature difference between two defined surfaces of material or construction under steady-state conditions. R-value is expressed in *m2 K/W.*

U-factor is the heat transmission in unit time through unit area of a material or construction and the boundary air films, induced by unit temperature difference between the environments on each side U-value is expressed in *W/m2 K.* The relationship between R-value and U-factor is assumed inverse but is may not be true always.

The typical U values of walls & roof materials and common insulation material are given below:-

Material	U-value (W/m2K)	Thickness (mm)
RCC Walls	1.95	225
AAC Blocks	0.67	230
Concrete Roof	2.5 – 3.0	150
Extruded Polystyrene (XPS)	0.028	60

Glass Wool stuffing	0.25	150
Expanded Polystyrene (EPS)	0.30	100
Air (Still)	0.20	30

Source: IGBC Bulletin: Building Insulation, April 2008.

8. Waste Management:-

The waste in the form of useless materials from household or industry because of construction and demolition debris or agricultural by products may be utilised to construct the buildings. The Sustainable architecture focuses on site use of Waste management by incorporating things such as grey water system for gardening and composting toilets to reduce sewage etc.. These systems may reduce the large waste into a small amount of packaging waste.

9. Building Placement or Location:

The sustainable architecture generally this aspect of locating buildings in the mixed zones. In urbanised environment the mixed use zone may be used to avoid the unnecessary energy consumption for transportation. The people may reach into these buildings by public transport, bicycle or even by foot.

Certification Programmes for Green Building:-

BREEM: BREEM stands for Building Research Establishment's Environmental Assessment Method, developed in UK in 1990s is one of the earliest building environmental assessment methods. It covers building types of Office, homes, industrial Units and schools. As per the points earned by the building it gives rating as 'Pass', 'Good', 'Very Good' or 'Excellent'. Under BREEM these points are checked for rating, they are Management (Waste Management, Pollution Minmization), Health and Comfort (adequate ventilation, humidification, energy efficient lighting etc..), Energy Savings, Transport Facility, Water consumption, Use of Material in Building, Land Use, Ecology and Pollution (on-site treatment, renewable energy sources etc..)

CASBEE: CASBEE stands for Comprehensive Assessment System for Building Environmental Efficiency, developed in Japan in 2001. This method is based on the life cycle of the building and includes pre - design, new construction, existing buildings and renovation. CASBEE method distinguishes environmental load form environmental quality and building performance. Under CASBEE the points for evaluation and certification are divided into two groups known as Building Environmental Quality and Performance and Building Environmental Loadings.

Green Building Tool: GB Tool was developed in 1998 by International Framework Committee for the Green Building Challenge. It is an International project in which more than twenty five countries are involved. The assessment criteria is based on local benchmarks of typical practice and scale is used for score, if the building is below typical practice it is given -1 or +1 to +5 for representing good to very high performance. The major points of criteria are Resource Consumption, Environmental Loadings, Indoor Environmental Quality, Energy Consumption and Site Selection.

LEED: It stands for Leadership in Energy and Environmental Design, developed and piloted in United States in 1998. It is a consensus-based building rating system based on the use of existing building technology. The following key components are checked under the LEED system: Sustainable Site, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality and Innovation and Design Process (Professionals and Innovative strategies for Sustainable Design). The LEED gives rating to the buildings in four levels. These are Certified, **Silver, Gold** and **Platinum** on the scores of 40 – 49, 50 – 59, 60 – 69 and 80+. It is world wide popular and Indian agency IGBC (Indian Green Building Council) has adapted the LEED system and has launched the Indian version of LEED rating system.

HK-BEAM: It stands for the Hong Kong Building Environmental Assessment Method. It is voluntary scheme launched in December 1996. It is based on life cycle impact of building in holistic view. HK – BEAM integrates the assessment of many key aspects of building performance including Hygiene, (Health, Comfort amenity), Land Use, (site impacts and transport), Use of Materials, (recycling and waste management), water Quality, (conservation and recycling), energy Efficiency, (conservation and management).

GRIHA: It stands for Green Rating for Integral Habitat Assessment, developed by TERI for measuring and rating building's environmental performance in the varied climate and building practices. This tool rates the building on its qualitative and quantitative assessment criteria on the degree of 'Greenness'. GRIHA tries to strike a balance between the established practices and emerging concepts both nationally and internationally. The GRIHA is a five star rating system which emphases on passive solar techniques for optimising indoor visual and thermal comfort. The building is assessed on its predicted performance over its entire life cycle from inception through operation.

COSTFORD: Centre of Science and Technology for Rural Development is a non profit organisation in Kerala, established in 1985. It focuses on improvement

of housing and made significant gains in providing alternative philosophy and techniques for providing cost – effective, energy efficient and more appropriate housing for all groups in the society. Similarly, ***Habitat Technology Group*** established in 1987 is totally committed to the concept of green and human architecture. It also works as nodal agency to carry out green buildings assessment in Kerala.

10. Green Library Buildings:-

- Anythink Brighton, Brighton, U.S. – First Carbon – positive library in USA.
- Ballard Branch Seattle Public Library, U.S. – Green roo, conserve rain water, use solar panels, sky light lited, recycled carpet.
- Blair Library, Fayettevile Public Library, U.S. - First building in the state of Arkansas to register for LEED certification, with green features.
- Bozeman Public Library, Bozeman, U. S. - Utilises daylight, recycled green materials received LEED Silver Certificate.
- Eden Prairie Library, Eden Prairie, U. S. Natural gas fuel to create power and heating on-site.
- Crowfoot Branch Calgary Public Library, Calgary, Canada, Incorporates daylight and energy harvesting, Uses of recycled material.
- Spanish Peaks Library, Walsenburg, UK, Uses Geothermal system for heating and cooling. Recipient of Stephen H Richard Award in 2010.
- Helensiki – Germany – Green roof and solar powered library.
- Kanazawa, Japan, Spacious and natural light filled library.
- National Library Singapore, Singapore, First green library for Kids.

11. Indian Scenario:-

In India the energy efficient buildings are being constructed in the cities and the number of buildings is increasing at very fast speed. IGBC in its efforts to develop Green Building rating systems for various building types has launched five new green building rating systems covering Existing MRTS, Healthcare facilities, Data Centres, Villages and Railway Stations. Dholera is the first green city of India and Mawlynnong (Meghalaya), Tilpat (Haryana), Mori-Moripodu (Andhra Pradesh), Punsari (Gujrat) and Bhond (Haryana) have been categorised as Green Villages in India by IGBC. The Siddhivinayak Temple and one mosque are green in green building category.

As per the data made available by M/s Saint Gobain Glass, Ltd., LEED 'GOLD'certified buildings in India are as follows:-

Delhi	-	3
Chandigarh	-	3
Chennai	-	21
Hyderabad	-	5
Bangalore	-	8
Uttar Pradesh	-	8
Visakhapatnam	-	1
Kochi	-	2
Coimbatore	-	1
Pune	-	5
Mumbai	-	5
Surat	-	1
Kolkata	-	5
Bhubneshwar	-	2
Ahmedabad	-	1

The Green buildings or energy efficient library buildings are very few. The existing university library buildings have been evaluated as per criteria fixed by IGBC or LEED and the library buildings of Karnataka University, Dharwad, Panjab University, Chandigarh, University of Delhi, Delhi are considered to be energy efficient library buildings because of their features of lighting, hot and Cool system and indoor air quality.

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Functioning of Rural Public Libraries in Bidar District: A Study of User's Perspectives

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Abstract: Public libraries are the standing testimonies of living democracies. They are by the people, for the people and of the people. The study reports the perception of the users of **five rural public libraries of Bidar District.** Questionnaires were distributed to 20 library users of each of the five randomly selected rural public libraries of Bidar District. The purpose was to undermine their perception of the functioning of rural public libraries. The study reveals that : 77 are male respondents and 23 are female respondents; most of the respondents, visiting the rural public library, belong to the age group 16-25; most of rural public library users possess SSLC qualification; the majority of users of rural public libraries in Bidar district visit the library once a week; primary purpose of the respondents in visiting the library is to read newspaper; the library professionals working in these rural public libraries are really helpful and they help the users frequently in all times of need; 29 respondents rated the quality of reference service of the rural public libraries as excellent, 40 of them as good, 25 of them as Just Ok; majority of the users of these rural public libraries are well satisfied with the performance of the circulation desks; most of the respondents feel that their libraries should support life-long learning; 27 respondents expressed that their level of satisfaction on library services was excellent followed by 47 respondents rating the satisfaction level as good; The top most reason for not having used the library last year was the time-constraints faced by the respondents. It is suggested that books for more competitive exams should be made available along with sufficient number of computers, internet facility and furniture for the readers.

Keyewords: Public libraries, Bidar Distrct, reference service, circulation desks, library staff, rural libraries, user's perception

1. INTRODUCTION

The public library as it is understood today is a multi-purpose informative, educative and cultural agency and is considered to be an intellectual power-house, which strives to fulfil and meet the educational, cultural and informational needs of the public by providing documents containing information relating to their fields of specialization, activities, professions and occupations. It makes them aware of the economic, social, cultural and political developments that take place around them and is also considered to be an institution for recreational value for a positive use of their leisure time. Public Library is generally defined as an institution of social life the community towards fruitful use of leisure time. Its sustains and raises the standards of public and social conduct. It is a most powerful instrument for sustaining the desire to learn.

2. OBJECTIVES

- To show gender, age, marital status and academic qualification-wise distribution of respondents.
- To find out the frequency of library visits by the respondents
- To trace out the purposes of visiting library by the respondents
- To list out the reason for not having used the library
- To evaluate the quality of library services, functioning of circulation desk and helpfulness of library staff
- To elicit the level of satisfaction of the respondents on the functioning of rural public libraries.

3. METHODOLOGY

A total of 100 respondents are randomly selected for the study. 20 respondents are selected from each of the following five public libraries of Bidar District.

Humnabad Public Library Branch, **Bhalki** Public Library Branch, **Aurada** Public Library Branch, **Basavakalyan** Public Library Branch and **Bidar** Public Library Branch.

The data was collected from the respondents with the help of a structured questionnaire. The collected data was analysed and presented in the form of tables and interpretations.

4. DATA ANALYSIS AND INTERPRETATION

Gender-wise distribution of respondents

S.No.	Gender	No.of respondents
01	Male	77
02	Female	23
Total		100

Table 1 shows the gender wise distribution of the respondents. 77 are male respondents and 23 are female respondents. It shows that male respondents are more than the female respondents in the present study.

Age –wise distribution of respondents

S.N o.	Age (in Ranges)	No.of respondents
01	Below 15 years	09
02	16 – 25	35
03	26 – 45	31
04	Above 45	25
Total		100

The above table 2 represents the age-wise distribution of the respondents. 09 respondents belong to below 15 age group, 35 respondents are in 16-25 age group followed 31 respondents in 26-45 age group and 25 respondents are above 45 age group. Thus, most of the respondents, visiting the rural public library, belong to the age group 16-25.

Marital status of the respondents

S.No.	Marital Status	No.of respondents
01	Married	54
02	unmarried	46
Total		100

Table 3 describes the marital status of the respondents. In this study 54 respondents are married and the remaining 46 respondents are unmarried. Thus majority of the respondents of our study are married people.

Academic qualification of the respondents

S.No.	Academic qualification	No.of respondents
01	SSLC	37
02	HSC	17
03	UG	31
04	PG	13
05	MPHIL	01
06	PhD	01
Total		100

It can be easily understood from the above table 4 that 37 respondents possess SSLC qualification, followed by 17 respondents who possess HSC and 31 respondents who are undergraduates. 13 respondents are post graduates. The respondents with research qualification are the least. Thus, most of rural public library users possess SSLC qualification.

Frequency of library usage

S.No.	Frequency	No.of respondents
01	Once a week	64
02	Once in every three weeks	17
03	Once a month	08
04	Once in every six months	06
05	Once a year	05
Total		100

From the above table, it is evident that 64 respondents visit the library once a week followed by 17 respondents who visit the library every three weeks. 8 respondents visit the library only once a month. Thus, the majority of users of rural public libraries in Bidar district visit the library once a week.

Primary purpose of using the library

S.No.	Purpose of using library	No.of responses	Percentage
01	Reading Newspaper	82	45
02	Employment News	42	23
03	Preparing for competitive exams	13	07

04	Entertainment	34	19
05	others	12	06
Total		**183**	**100**

It is clear from the above the table depicting the purpose of using library, 45 % of the respondents visits the library for reading the newspaper followed by 23 % of the respondents for getting information on Employment opportunities. While 07 % of the respondents use the library for preparing themselves for various competitive exams, 19 % of the respondents come to library to gather some entertainment news. Thus, primary purpose of the respondents in visiting the library is to read newspaper-thus seeking information in current affairs has been the main motive behind their visits.

Helpfulness of library staff

S.No.	Help is rendered	No.of respondents
01	Frequently	51
02	Sometimes	35
03	Hardly ever	07
04	Never	07
Total		100

It is transparent from the above table that 51 respondents get help frequently from library staff and 35 respondents get help from them only sometimes. 07 respondents each get help hardly ever or never from the library staff. So, the library professionals working in these rural public libraries are really helpful and they the users frequently in all times of need.

Quality of reference services

S.No.	Quality of reference services	No.of respondents
01	Excellent	29
02	Good	40
03	Just Ok	25
04	Poor	06
Total		**100**

It is shown in table 8 that 29 respondents rated the quality of reference service of the rural public libraries as excellent, 40 of them as good, 25 of them as Just Ok

and 06 of the respondents rated the quality of reference services as poor in their respective libraries.

Effectiveness of circulation desks

S.No.	Circulation desks	No.of respondents
01	Excellent	27
02	Good	47
03	Just Ok	20
04	Poor	06
Total		**100**

It is clear from the table 9 that 27 respondents are of the opinion that the circulation desk of their rural public library is working excellently well and 47 respondents felt that the working of circulation counter is good. While 20 respondents are Just Ok with the performance of circulation desks, 6 of them rated it as poor. Thus, majority of the users of these rural public libraries are well satisfied with the performance of the circulation desks.

Continuance of library services

S.No.	Library Services	No.of respondents
01	To promote reading	45
02	To support lifelong learning	47
03	To provide access to information via computers	08
Total		100

It can be easily understood from the above table that while 45 respondents like the library to continue their efforts to promote reading, 47 respondents wish that their library should support lifelong learning and 8 of the respondents desire that their libraries should provide access to information via computers. Hence most of the respondents feel that their libraries should support life-long learning.

Level of satisfaction of library services

S.No.	Satisfaction Level	No.of respondents
01	Excellent	27
02	Good	47
03	Satisfied	20
04	dissatisfied	06
Total		100

It makes it clear from table 11 that 27 respondents expressed that their level of satisfaction on library services was excellent followed by 47 respondents rating the satisfaction level as good. While 20 respondents are just satisfied with the level of library services being rendered, 06 respondents expressed their dis-satisfaction on the library services.

Reasons for not having used the library last year

S.NO.	Problems in using the library	No.of responses	Percentage
01	I didn't have time	55	28
02	The library hours were not convenient	23	11
03	I buy books and read them at home	51	26
04	I get the information I need from the Internet	25	12
05	The library is too far	13	06
06	The library is only for children	16	08
07	In the past I didn't find what I needed	08	04
08	The library would not have what I needed	07	03
09	I don't know where the library is	04	02
	Total	202	100

It is evident from the table 12 that while addressing on the reasons for not having used the library last years, 28 % of them expressed that they didn't have time and 11 % respondents feel that library hours were not convenient to them. 26 % of the respondents were reading own books and 12 % of the respondents are satisfied with the information they get from internet. The top most reason for not having used the library last year was the time-constraints faced by the respondents.

5. SUGGESTIONS

- The library should build their collection so as to possess materials suitable to people of all educational background.
- More books on competitive exams are to be procured for the libraries to attract more users.
- Frequency of library visits of different groups of library users is to be increased by various attractive library programmes and events.

- The library should plan for certain outreaching programmes to support lifelong learning of the local user's community.
- Adult education service is to be taken up by the libraries, as an extension activity, as desired by the local users.
- Furniture and lighting arrangement should be sufficient and attractive.
- More magazines may be added since 35 % of the users visit the library to read magazines.
- Internet connection may be provided in the library, with sufficient number of computers.

6. CONCLUSION

The Government should take all the necessary steps to strengthen the functioning of rural public libraries it terms of finance, staff and all other administrative support. In the light of penetration of ICT in library sector, it is suggested that the libraries may be automated using free and open source software; all the public libraries may be networked for resource sharing; internet service may be extended in the library; photocopy service may be introduced etc. The readers should build a positive notion about the functioning of these rural libraries and support their progress in all the possible ways and means. The library staff should provide a conducive and welcoming atmosphere in the library to attract and sustain the readers forever.

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How to satisfy the users: User survey in Tripura University

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Abstract: The way the general public and the user perceives library professional is of great concern for the library professionals. However this issues may be addressed by knowing the user better and making known to the users that library professional are there to help information seekers. The statement can be put in practical by doing user satisfaction survey in a regular interval. The study looks into user perception based on experience, satisfaction and expectation. It was found that user in Tripura university do not have a good impression on library professionals. The satisfaction level was considerably low. However the study shows that their expectation can be met by implementing some changes in particular areas such as, customer relation, enhancing professional ethics and better human resource management.

Keywords: User satisfaction, User survey, User perception, Tripura University

1. Introduction

There has been an upheaval in the world of Library lately. There is a question of the relevance of library existence from various angles. Nevertheless the library still exists and appears to have its relevance in the present age. The library started with the collection of clay tablets which carries important human history. Well the Royal Library of Alexandria was established in 300 BC. The oldest, still running, public library in the world is called La Bibliotheque National de France (National Library of France). It dates back to 1368, making it almost 650 years old.

Wherever there has been public reliance on documents through bureaucracy, law, religious practice, cultural expression and, later, commercial production, there have been libraries and archives to store, organise and make available those documents (Hanson 2014).

The way the general public or specific user groups perceive librarians' image has been of concern to library and information science (LIS) profession for decades now (Balling *et al.*, 2008; Bickley and Corrall, 2011; Fagan, 2003; Majid and Haider, 2008; Schuman,1990). It could be argued that LIS profession is worried with self-examination (Hillenbrand, 2005; Katz, 2003). However, the reasons why information professionals are so concerned with their image rely mainly on their need to win public support. This will, in turn, entail the survival and development

of information organizations, the implementing of change and reform, as well as their use and importance within a parent institution, and funding (Evjen and Audunson, 2009; Green, 1994; Harrif and Rowley, 2011; Majid and Haider, 2008; Schuman, 1990; Shaw, 2010).

Information professionals need to maintain the positive image that currently public library users obtain but also work on promoting further their service and user-oriented tasks and characteristics, as well as their leadership skills (Evgenia 2016). In this regards the examination of library professional appears to be a must. Regardless of their fear.

The use of library by the user community in general and reference sections particular is worrisome. The user's expectation is such that, a library staff should be like a search engine. The availability of alternative source for acquiring information through modern technology may be attributed for this phenomenon. The availability of information, the alternatives in provision of information and the public budget cuts raise further challenges for public libraries (Vakkari *et al.*, 2014) as well as to the academic libraries.

The emergence of information and communication technology (ICT) appear to have outplayed the significance of the library among the young adults. Indeed, it has brought about a paradigm shift in the way people look at libraries today. In these debates the library and library professional have been trying to establish its significance by evolving into a different form of a library. It appears that despite the innovative services the information organizations offer, the incorporation of technological advances and the new roles the information professionals have assumed, the misconceptions of the librarian's work persist (Vassilakaki and Moniarou-Papaconstantinou, 2014).

To keep up with the developmental pace of information and communication technology, the library fraternity has put themselves in a situation where they are competing with Google, Wikipedia, amazon etc. User satisfaction with regard to public library services has become a major concern in the current period (Joy and Idowu, 2014). Although academic library is not categorically mentioned in the study, the same applies for academic library too. Thus, the assessment of user satisfaction, irrespective of user categories, is seen as a vital issue in the contemporary literature related to public libraries. However, in these paper we will explore the student's perception, satisfaction, experience and expectation. The main aim of the study is to understand the user.

2. Significance of the study

The Tripura University (it was then, called as Calcutta university post graduate centre) central library was established 1976. However, it appears that user study have never been done before. Taking into consideration of the fact it will have huge impact on the library in particular. The study will also allow us to see the clear scenario of the user community which may later serve as a sample for further study.

Since library is a spending organization, it needs to substantiate the very existence and importance to the funding institution. We can measure the importance by user study which is translated into user satisfaction level.

If we take into consideration, the existence of a community library or public library which is funded by the community themselves, we may say the demand for library is directly proportional to the fund invested (according to supply and demand theory propounded by Alfred Marshall). Which means, as the demand for library grows the amount of money invested will also increase and vice-versa. That is why it is essential to have this study on user's perception and satisfaction.

3. Objectives of the study

To examine the users perception on library in Tripura University. To take note of the users experience and critically examine their Satisfaction and expectation. Thereby exploring the possible changes and improvement.

4. Research methodology

The research was carried out in Tripura University. Tripura University is a central university located in the northeast India. There are 35 departments which off post graduate degree, 52 colleges and universities are affiliated to the university at present. The library has 1150 members

In order to avoid personal biasness, unstructured interview and structured questionnaire method was employed for the collection of data, based on the Montana State Library guidelines (Montana State Library, 2010) and qualtrics survey technology (Scott M. smith). 240 students were interviewed in groups from three departments. Out of 200 questionnaire distributed to randomly selected participant, 180 responded, giving a response rate at 90%. According to the rules of thumb proposed by Roscoe (1975), a sample size larger than 30 and less than 500 is acceptable. Hence, the sample size of this study is in line with the above

criteria.

The respondent consist of 80 males and 100 females and approximately 80% were tribal. The data was analysed by using simple percentage and frequency counts.

5. Analysis and Finding

The question of how much the user community loves their library is of great concern today. Therefore some curious question were asked during the interview. For this matter the students were asked to respond based of their previous experience in order to cover maximum colleges in Tripura. 100% of them had visited a library at least once in their life time and 95% of them think that library is important. The 5% were not sure.

Out of 240 students, only 5% (i.e. 12 students) of them has come across a good library staff. 95% of them had a bad encounter with the library staffs directly or indirectly.

Table: 1 Frequency of respondent's use of the university library.

Gender	Once a year	Every 2-3 months	Every month	Every week	2-3 times a week	Daily	Do not use
Female	3(3%)	34(34%)	41(41%)	20(20%)	2(2%)	0(0%)	0(0%)
Male	4(5%)	20(25%)	39(48%)	17(21%)	0(0%)	0(0%)	0(0%)

It was found that majority (i.e. 41% female and 39% male) of the students attend the library once a month. There are huge percentage of students (34% female & 20% male) who visit library every 2-3 months, which means they do not use even once a month. 3% of female and 4% hardly visit the library. There were 20% female and 17% male visit the library every week. Only 2% students were found to be regularly using the library. It was found that no students visits library on daily basis. However, everyone used library once in a year. From the study is was found that female student are more frequent users compared to male students.

Table: 2 Users' satisfaction table

variables	Not satisfactory	Somewhat Satisfactory	Satisfactory	Very Satisfactory	excellent
Collection	34(18.8%)	80(44.4%)	40(22.2%)	15(8.3%)	11(6.1%)
Display of new arrivals	10(5.5%)	91(50.5%)	39(21.6%)	25(13.8%)	15(8.3%)
Lending and reference services	67(37.2%)	33(18.3%)	40(22.2%)	22(12.2%)	18(10%)
Shelf arrangement	50(27.7%)	100(55.5%)	12(6.6%)	18(10%)	0(0%)
Opening hours	113(62.7%)	40(22.2%)	17(9.4%)	7(3.8%)	3(1.6%)
Library environment	2(1.1%)	82(45.5%)	30(16.6)	51(28.3%)	15(8.3%)
E-library	120(66.6%)	25(13.8)	15(8.3%)	20(11.1%)	0(0%)
Over all I am satisfied with the library	111(61.6%)	40(22.2%)	9(5%)	12(6.6%)	8(4.4%)

The table 2 discusses the satisfactory level of the users on various services provided in the library. The table contain four level of satisfaction, where the first two sets may be considered as not satisfactory and last two categories may be considered as satisfactory whereas the middle may be called as neutral. On this basis we will consider the result not satisfactory and satisfactory.

It was found that 18.8% of the users were not satisfied with the collection where as 44.4% of them found somewhat satisfactory. 22.2% said that the collection was satisfactory and 8.3% finds it very good while 6.1% think that the collection was excellent. It may be concluded that the users did not have much complain regarding the collection.

The second variable in the table shows the satisfactory level of the display and new arrivals, it was found that 5.5% were not satisfied where as 50.5% finds it okay and 21.6% finds it satisfactory, 13.8% was very satisfied, 8.3% on the other hand found it excellent. The overall inclination is towards the not satisfactory side by this result it means that the user are not satisfied with the service.

Lending is the most sought after service in the library in the context of Tripura University. Whereas the reference service is found to be utilized by only 5 patrons in average, per day. However students use the lending section for reference

services. Therefore placing together of the two services was seen to be reasonable. In this service 37.2 % of the users were not at all satisfied and 18.3% of the not happy 22.2% said that it was satisfactory, 12.2% think that it is good and 10% found it very good. The service was found to have satisfied lesser population of the user community.

Shelf arrangement is one of the most important service provided in the library. Excellent shelf arrangement can enhance retrieval speed, thereby saving the time of the users as well as the library staff. Regarding shelf arrangement 27.2% said that it was not satisfactory, 55.5% was not so happy with the arrangement. Only 6.6% found it satisfactory, 10% think that it is very good. None found it excellent. Based on the response given by the users, it was clear that they were not satisfied with the shelf arrangement.

From the study it was found that the opening time of the library is not satisfactory to the user. 62.7% user were not at all happy with the timing and negligible users with 1.6% found it very convenient.

Library environment includes the sitting arrangement and convenience of studying. In spite of the poor furniture and less accommodation, only 1.1% were not satisfied with it. The majority of the user found it satisfactory

The library also provide electronical access to the e-resources available to the users through library from UGC or other subscribed by the university. The student have Wi-Fi connection in the library premises apart from that, there is an e-library centre in the library. The e-library plays a vital role for urban population since they cannot afford personal computer. Therefore students rely on the e-library for access to the online resources. In this section the users have great contention of unsatisfactory service. 66.6% of them said that it is not satisfactory.

The last variable examine the overall satisfactory level of the library users. It was found that 61.6% of the users were not satisfied with the overall performance of the library. 22.2% found it somewhat satisfactory which may be interpreted as consolation. 9% said that the performance of the library is satisfactory, 6.6% found it very satisfactory and 4.4% found the library services excellent.

6. Experience

The experience and expectation will allow us to examine the image of the library professionals. It will also give some clear idea on how the general public see the library professionals. Whereby the library professional may implement some adaptable changes in the future. The tables are important because library staff

and professionals are the mirror of the library. The user perception on library staff may adversely affect the image of the library as well as their interest to come to library. It is common that everyone wants to go the shop with approachable, kind and friendly shopkeeper.

They were also asked to use a term to define the library staff based on their experience. The following words were used by them as a synonyms for librarian. Using the terms they used we will try to rate the fondness and affinity to come to library. We will also be able to see the user perception regarding library staff or librarian.

Table: 3 *Users experience and observation of the library staff*

observation/experience	frequency	Percentage (%)
They are nice/good	12	6.6
They are Helpful	7	3.88
They are rough	3	1.66
They are Proud	1	0.55
They are not interactive	23	12.7
They are Busy	42	23.3
They are Old	1	0.55
They are Dull	15	8.33
They are Gloomy	13	7.22
They are Silent	40	22.22
They are Lazy	7	3.88
They are Boring	10	5.55
They are Selfish	1	0.55
They are Tough	1	0.55
No response	15	8.3
Total	180	100

The above table reveals that, the words used by the users to describe library professionals incline towards the negative side. Out of 14 most frequently used words only 10.4% words were positive. 87.9% of the words used indicates the unfavourable attitude towards the library professional. 8.3 % didn't respond to the question.

From this revelation we can conclude easily that, the users of Tripura university library do not have a good impression about the library professionals. Their

perception was found to be extremely bothering.

7. Expectation

The expectation of user can never be satisfied in this age of google, the expectation has sky rocketed. However there is no harm in knowing the expectation of the users. The awareness of their expectation can be a guide for innovation and ideas. Therefore it is essential to know their expectation and so that the gap between the staff and users may be bridged.

When asked what they expect the librarian of library staff to be. These are some of the characters they expect from the library staff.

Table: 4 users' expectation table

expectation	frequency	Percentage (%)
Should be Friendly	50	27.7
Should Smile	30	16.66
Should be Sweet	2	1.11
Should be Available	7	3.88
Should be Approachable	39	21.66
Should be Gentle	9	5
Should be Charming	1	0.55
Should be Cheerful	10	5.5
Should be Interactive	21	11.66
Should be Open	3	1.66
Should be Quick response when prompted	1	0.55
Should be Smart	2	1.11
Should Cheerful	4	2.22
Total	180	100

From the way they look at librarian it was certain that their expectation is inclined towards personality and communication. It was interesting to find out that the users expectation is not the good quality of information sources or services, rather it happened to be the personal characters of the library personnel. Staggering 27.7% of the users expect the library staff to be friendly, 21.6% want the library professionals to be approachable followed by 16.66% of the user who expect library staff to smile when approached. 11.66% wants the library

professionals to be more interactive. To my utter surprise, only 1.1% users expect the library staff to be smart and negligible 0.5% wanted the library staff to be quick in answering to queries. And that appears to have lightened the job of a library staff by far. However, to dig deeper into their expectation it demand a very high standard professional ethics.

From the above two tables, we can have three obvious conclusions, firstly, maximum of the patrons are not likely to interact with the library staff since they have wrong perception. Secondly, there is a weak relation between the staff and the users based on the terms they used to describe the library personnel. Lastly, the chance of the patrons visiting the library is comparatively low because of the fact that their expectation are not met. We cannot say that the patrons come to the library if they are treated properly. However the relationship between the staff and clientele may adversely affect the probability of visiting the library again.

8. Conclusion and suggestion

From the study we found out that the Users of Tripura University were not in favour of library services because 61.6% of the respondent were not satisfied with the overall performance of the library. It may be cited that services like lending and reference, e-library, working time of the library etc. need serious rectification.

If the above results have to be taken into consideration the user community do not have a good perception on the library personnel. Their misconception in spite of all the hard works by the library personnel may be due to lack of awareness. In this regards, instead of making excuses it may be important for the library authority to work on the relationship with the users. This issues may be addressed by enhancing the professionalism and improvement of professional ethics. This issues of perception pose a great challenge to the library existence, as the user demand is necessary for any type of library to sustain in the present scenario.

The study further revealed that the user's expectation was more on personnel's conduct rather than professional efficiency. This problem is rather practical and may be difficult to implement any dramatic change overnight. However, attempt can be made by improving the human resource management. Giving communication skill development courses and training may be recommended for library professional in general and personnel dealing with the customer directly, in particular.

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Information Literacy Awareness Towards Research Scholars-A Case Study of Karnataka State Women's University, Vijayapura

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Abstract: The study researches to find out the knowledge of Information Literacy concept among Research Scholars of Karnataka State Women's University, Vijayapura based on a survey of 96 users and emphasizes the relevance of Information Literacy programs in a University Library setup for better usage of resources.

Keywords: Information Literacy, University Library, research Scholars, Karnataka State Women's University, Vijayapura and Karnataka.

1. INTRODUCTION:

Information literacy is a key component in the improvement of the students as an independent learner. It also contributes to the ability of students to work self-assuredly with information and IT tools, and to develop necessary critical thinking skills. All these are essential attributes for the modern Research Scholars. The new graduate must not only have expert knowledge in their field, but also have a range of generic competencies required to participate in a place of work subject to constant change, the skills to continue learning throughout a professional life span.

Information literacy is no longer just a library issue. It is the critical campus wide issue for the twenty-first century, of keen importance to all educational stakeholders, including administrators, faculty, librarians, media and information technologists, assessment coordinators, faculty development directors, service learning specialists, student affairs personnel, and career development professionals. Broadly defined, information literacy is a set of abilities that allow a person to recognize when information is required and to effectively and efficiently act on that need.

A number of studies have been reported on Information Literacy Skills, Competencies, Standards, Policies, Models and on programs etc. These studies were piece meal general surveys. But it was observed that there is a lack of in depth studies to find out the Information Literacy of all categories of users as research

scholars in university environment. Hence, the present study was undertaken.

2. Information Literacy:

Information literacy is a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." Information literacy also is increasingly important in the contemporary environment of rapid technological change and proliferating information resources. Because of the escalating complexity of this environment, individuals are faced with diverse, abundant information choices-in their academic studies, in the workplace, and in their personal lives. Information is available through libraries, community resources, special interest organizations, media, and the Internet and increasingly, information comes to individuals in unfiltered formats, raising questions about its authenticity, validity and reliability.

Information literacy forms the basis for lifelong learning. It is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning. An information literate individual is able to:

- Determine the extent of information needed
- Access the needed information effectively and efficiently
- Evaluate information and its sources critically
- Incorporate selected information into one's knowledge base
- Use information effectively to accomplish a specific purpose
- Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally.

3. REVIEW OF LITERATURE:

Karisiddappa [2007] highlights the importance of information literacy and lifelong learning in effectively utilizing the e-governance initiatives undertaken in different parts of rural India and proposes possible programs and initiatives for implementation of information literacy and lifelong learning. **Chauhan and Murthy** [2006] provides an overview of the awareness programs initiated by INFLIBNET for information literacy throughout the country under UGC-Infonet: E-Journals consortium.

Joshi [2011] assessed information literacy competency of science, engineering and technology students of higher education institutions in Delhi. **Varalakshmi** [2007] advocated that effective implementation of information literacy programs is possible with efficient models of information literacy. **Sudhakar Gouda** [2006] has also emphasized the need for information literacy in higher education in India. **Chandra** [2006] discusses the role of information literacy for excellence

Ramakrishna and Valmiki conducted in KUVEMPU University to assess the computer literacy and information literacy of the post graduate students reveal that majority of the students lack awareness regarding the printed reference sources, highest percent of them do not possess the ability to identify the key concepts in the given information environment.

4. METHODOLOGY:

The present study is based on the survey method using a structured questionnaire and the scope of the present study is limited to the awareness of Information Literacy Concept among Research Scholars of Karnataka State Women's University, Vijayapura. The questionnaire has been devised keeping in view the objectives of the study. The questionnaire is divided into two parts, part one deals with background information and part two deals with Information Literacy awareness among research scholars of study population.

5. Analysis and interpretation of data:

Based on the data collected from 96 respondents an attempt has been made to analyze and interpret the data in terms of awareness of IL concept among Research Scholars.

Table: 1-Category

Category	Number	Percentage (%)
M Phil Scholars	25	26.04
Ph D Scholars	71	73.96
Total	96	100.0

From table 1, it can be observed that the study population comprises of 26.04 % of (N=25) M Phil scholars and 73.96 % of (N=71) Ph D Scholars.

Table: 2-Age

Age	Number	Percentage (%)
26-30	45	46.9
31-35	41	42.7
36 and Above	10	10.4
Total	96	100.0

Table 2 indicates the age wise distribution of the respondents which is grouped in three stages i.e., 26-30years, 31-35, 36 and above.46.9% (N=45) of the study population is between age group of 26-30 years. 42.7 %(N=41) from 31-35 years and 10.4 %(N=10) belongs to the group of 36 and above.

Table: 3-Faculty wise Distribution

Faculty	Number	Percentage (%)
Social Science	35	36.5
Science	20	20.8
Humanity	15	15.6
Commerce & Management	15	15.6
Education	11	11.5
Total	96	100.0

Table 3 indicates that 36.5 % of (N= 35) belong to faculty of Social science, 20.8% of (N=20) belong to Science faculty, 15.6% of (N=15) belong to Humanity, 15.6% of (N=15) belong to Commerce & Management faculty, and 11.5% of (N=11) belong to Education faculty.

Table: 4-Social Category

Social Category	Number	Percentage (%)
GM	45	47.0
OBC	26	27.0
SC/ST	25	26.0
Total	96	100.0

Table 4 indicates that 47 % of (N=45) respondents belong to GM category. 27 % of (N=26) belong to OBC and the remaining 26 % of (N=26) respondents belong to SC/ST category.

Table: 5- Domicile

Domicile	Number	Percentage (%)
Rural	46	43.0
Urban	50	57.0
Total	96	100.0

It can be shown from table-5 the 43.0% of (N=46) respondents are from Rural area, And 57.0% of (N=50) are from Urban area.

Table: 6- Languages Known

Language	Number	Percentage (%)
Kannada	93	96.9
English	87	90.6
Hindi	90	93.7
Marathi	40	41.7
Urdu	50	52.0
Telugu	06	6.25

From table-6 it is found that 96.9 % of (N=93) respondents known Kannada, 90.6% of (N=87) known English, and 93.7 % of (N=90) known Hindi. Marathi is known to 41.7 % of respondents (N=40), Urdu is known to 52 % of (N=50) and 6.25% of (N=6) known Telugu.

Table: 7- Stay

Stay	Number	Percentage (%)
Hostel	45	47.0
Home	26	27.0
Rented Room	25	26.0
Total	96	100.0

Table 7 indicates that 47 % of (N=45) Scholars stay in Hostel. 27 % of (N=26) stay in home and 26 % of (N=25) Scholars stay in Rented Rooms.

Table: 8- Nature of Research Scholars

Nature	Number	Percentage (%)
Full Time	64	66.7
Part Time	32	33.3
Total	96	100.0

From table-8 it can be shown that 66.7 % of (N=64) Research Scholars are working Full Time while 33.3 % of (N=32) Research Scholars are pursuing their work Part Time.

Table: 9-Usefulness of Library Orientation/User Education Programs

Usefulness	Number	Percentage (%)
Useful	96	100.0
Not Usefulness	0	0

A question was asked to the research scholars to know whether Library Orientation/ User Education programs are useful to them. It is evident from table-9 that every single respondent feels that Library orientation/User Education programs are Useful for them to utilize the Recourses.

Table: 10-Conceptualization of Information Literacy

Conceptualization	Number	Percentage (%)
User Education	96	100.0
Bibliographic Instruction	0	0
Retrieve Information with acute Technique	0	0

One of the objectives of the study was to know how users conceptualize the term Information Literacy. All the users feel that the concept of information literacy is related to user education.

Table: 11-Conceptualization of Information Literate Person

Information Literate	Number	Percentage (%)
Finds Information Effectively	57	59.4
Manages Information Generated	24	25.0
Critically Evaluates Information	11	11.4
Applies new Information	4	4.2
Total	96	100.0

It was intended to know how the user community conceptualize information literate person. From table-11 it can be observed that more than half of the user community feel that Information literate person is able to find effectively (59.4% N=57). Nearly one fourth of user community thinks that Information literate person can manage information generated. 11.4% of users opine that Information literate person critically evaluates information (N=11). A very small percentage of

users (4.2%, N=4) feel that Information literate applies new information.

Table: 12- Modes Preferred to learn Information Literacy Skills

Modes	Number	Percentage (%)
Class Discussions	48	50.0
Research Assignments	26	27.0
Computer assisted training	13	13.5
Group work/Peer review	9	9.3
Total	96	100.0

The study population was asked to indicate their preferred modes to learn IL skills and four alternatives were given to them. Table 12 indicates that more than half (50%, N=48) prefer to learn IL skills through Class Discussion.Method, More than one fourth of users (27%, N=26) prefer to learn IL skills through Research Assignments. More than thirteen percent of users (13.5%, N=13) prefer to learn IL skills through Computer assisted training, and 9.3 %(N=9) Prefer Group work/Peer review method to learn IL skills.

Table: 13-Purposes for Conducting Information Literacy Programs

Purposes	Number	Percentage (%)
Use of Printed Sources	40	41.6
Use of Electronic sources	95	99.0
Computers	90	93.7
Specific Application Sources	20	20.8
Online Databases	55	57.3
Internet	90	93.7
E-Mail	93	96.8
OPAC	70	72.9
Institutional Repository	90	93.7
In-house Databases	24	25.0
CD-ROM Databases	25	26.0
Digital Library	91	94.8

A question was asked to the respondents to indicate the purposes for which Information Literacy Programs need to be conducted. As many as 12 purposes were listed. It is found from Table 13 that IL programs are required to be organized for use of electronic sources (99%, N=95), e-mail (96.8%, N=93), Digital library

(94.8%, N=91). And More than ninety percent of the users also demand to organize IL programs to assist in the use of computers (93.7%, N=90), and OPAC (72.9%, N=70) Institutional repositories and Use of Internet and Use of on-line databases (57.3% of (N=55). Less than half of the user community also demands IL programs to facilitate the use of printed sources (41.6%, N= 40). 26.0% of users also demand IL programs to facilitate use of CD-ROM databases while 20.8% of users ask for IL programs on specific application sources.

Table: 14- Preferred Mode of imparting Information Literacy Programs

Information Literacy Programs	Number	Percentage (%)
Printed IL Instruction	67	69.8
Integrated in Course Curriculum	51	53.1
Online IL Instructions via university website	10	10.4
Online IL Instructions via Library website	7	7.2

From table-14 it can observed that the majority of the respondents preferred Printed Information Literacy Instructions (69.8%, N=67). Their second preferred mode for imparting IL instructions is through (53.1%, N=51) Integration of IL in Course Curriculum. 10.4% of (N=10) users feel that IL instructions must be carried out online through University website and a small percentage (7.2%, N=7) demand online IL instructions via library website.

6. SUMMARY OF FINDINGS:

- Research scholars feel that Library Orientation/User Education programs are useful to them.
- The user community is aware of the concept that Information Literacy is related User Education.
- A majority of the users conceptualize Information Literate person as a person who finds information effectively and efficiently.
- A majority of the user community prefers to learn IL skills through Class Discussions.
- IL programs are required to be organized for use of electronic sources, use of Internet and Digital library.

- A majority of the users prefer Printed Information Literacy Instructions and Integration of IL in Course Curriculum.

7. COCLUSIONS:

The importance of imparting information literacy programs to develop information literacy skills among the scholars cannot be ignored in the contemporary electronic environment. This has been recognized and accepted by majority of the scholars. The process of creating successful Information Literacy and Research Literacy program for research is long and complex. The primary steps for creating a programs are accepting the necessity of the program, utilizing the principles of learning, doing the research, collaborating with stakeholders, determining what methods work best for the institution's current circumstances, marketing the program, and then doing constant evaluation maintenance of the program.

Based on the findings of the study, it is quite clear that majority of the respondents indicated the usefulness of information literacy programs for optimization of library resources and services. However, more than half of the respondents under the study felt strongly the needs for Information Literacy (IL) skills in class discussions and hence, incorporation of IL should become a part of Curriculum at a graduate level irrespective of discipline. Further, regular imparting of information literacy programs by the librarian has been felt by majority of the respondents particularly for using electronic sources and hence, Library and Information science professionals should take initiatives in conducting information literacy programs in their organizations and update their knowledge by attending various Conferences, Seminars, Workshops, and job oriented training programs.

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Information Literacy Skills Towards Health and Family Welfare Programmes: With Special Reference to Women of Ballari District.

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Abstract: *This study attempts to explore the Information Literacy skills in accessing need of Health and Family welfare Programmes with special reference to women of urban and rural in Ballari District. The purpose of the study is to know the extent of Health literacy skills among the women. Further, the study reveals the various aspects of information need, Access to the needed information to accomplish a health promotion among women. In this paper an attempt has been made to highlight the women health Programmes initialed by central and state governments. Further, the study explores to find significance difference between rural and urban women awareness level in identifying and use of health information based on the findings, study also made some suggestions to improve the health Information Literacy system among women.*

Keywords: *Education, government health Programmes, health, information literacy, Women*

1. INTRODUCTION:

In twenty first century world has been an era of Information and its utilization. The social benefit of Information is better living. The need of Information plays an extremely important in the complex society. Information appearing is complicated to user, and it perceived that the Information Literacy, it is set of skills and knowledge that allows us to find, evaluate and use of the information we need, as well as to filter out the information we don't need.

Information Literacy Skills are necessary tools that help us successfully navigate the present and future landscape of information. Information affects every momentum of human life.

This momentum has led to Health Literacy. It is health promotion and to organize Health related Information for its better access by Health Programmes in real kind. The processing of Information Literacy Models application find Information how it gathered, analyzed, put in to manner of conductive to contemporary Health promotion

2. INFORMATION LITERACY:

Information is a difficult word to define. Webster dictionary mentioned Information as news, data, fact, intelligence or knowledge. Information Literacy is the process of knowing when and why information is required, where to find it, and how to evaluate, use and communicate it in an ethical way. It is the combination of all the skills (competencies) that are required for the effective and maximum use of information.

It is common to all disciplines, learn, how to learn in general illiterate and literate to all leaning environments, and to all level of life, it forms the basis of lifelong learning.'

3. REVIEW OF THE LITERATURE:

Literature review has identified been undertakento know pervious results and also present some new and unique dimensions of Information Literacy about Health and women. Several sources referred in Government publications, Newspapers, journals, books, Audio-visual and electronic sources and unpublished sources like Human sources, Theses, Reports have been referred to .

According to Satija (2013) emphasis should be on the Information Literacy, relation with knowledge, importance and functions of information, kind of information social and economic importance, role of information and as instrumental in empowering citizens in this complex and sophisticated social world.

Thaneshwar (2006) emphasizes on Health policy research as an emerging issue in India. It is relatively potential area for utility of Health system, especially after independence, resources and health education are scares and need focus

Subhas (2006) depicts the sex ratio and status of women in Indian culture, sex composition of human population is one of the basic demographic characteristics, It is important social indicator and it is support to health sector in females society in a society at a given point sex differentials in mortality, sex ratio at birth and sex

differential in population enumeration.

Unanimous (2013-14)Karnataka Health profile report provides statistical demography factors in Health and family welfare services in general to specific all factors of demographic on the basis of 2011 census stated. It is very basic and essential review.

Gabriel (2015) explained the facilities of the Government, among the Programmes Aroghya Bhagya stated health as wealth and how the government is very keen to ensure the benefits to all citizens. Especially for the first timers in the entire country, the state government has launched innovative Bike Ambulance Scheme in addition to 108 Ambulance service. In the society initiate to ensure quality medical treatment in urban and rural, people belonging to Above poverty line(APL) and Below poverty line (BPL) families to avail medical treatment in specialty emplaned hospitals Generic medicine sale and distribution of nitrification Anganawadis (Montessori)chosen. This article concludes the how does the Programmes performance in state understood.

After review of the literature made through LISA, LISTA, Emerald insight Health and family welfare, we find some gaps in Information Literacy. Health literacy has not been a subject of so serious discussion in India. It is indicated by the lack of literature on the subject. However debate on Information Literacy is ongoing . As of now the Information Literacy is emerging in all sectors with possible impacts on the women also. It will be good to have positive attitudes all along their life.

4. NEED OF THE STUDY:

The study was undertaken for the purpose of investing ability of identifies, locate, evaluate and effectively use of the information for the need and enhance their life. Through which contribute to society. It also contributes in the area of health sector. In the world, the Health and Family welfare is considered as important indicator in development and growth. To know the more accurate picture in Health sector reforms in India, Government implemented Health and Family welfare Services relatively late.

In Karnataka Potential relevance and utility of health and family welfare services is envisaged as an emerging issue for the health and service development. The perceptions are Women population engagement and utility of service, used for the Survival, growth and development in the life are fundamental for the future of family as well as society.

A woman is key factor to assist families in protect and maintain health and welfare. Information literacy skills and competence with respect to health and family welfare schemes among the Specifically Information literacy of women has not received much attention by researchers in the Indian context. Hence, an effort has been made in the present investigation, to explore the extent of Information Literacy Skills in accessing Government Health and Family Welfare Programmes .Also Investigate ability to identify, locate, evaluate and effectively usage of need of Health Information among Women Bellari District.

5. SCOPE AND LIMITATIONS OF THE STUDY:

The Present study was explorative in nature, mainly based on the Primary data collected from the sample respondents and the following limitation has been identified.

Accessed the health information need awareness and usage level and analyzed of existing popular health and family welfare programme schemes.

The study also explores to know the format and agents of information, sources and services and level of Information Literacy Skills. The target study population was women of urban and rural area of Ballari District.

6. OBJECTIVES OF THE STUDY:

The primary objective of the study is to determine the Information Literacy Level of women in accessing health and Family Welfare Programmes Information support to get best in Health Information.

The specific Objectives of the study are:

- To access the Health Information needs of women respondents under the study.
- To access the awareness level of women respondents with respect to various health and family welfare programs initiated by State and Central Governments.
- To find out the use level of health and family welfare programs among the respondents under the study.
- To identify the information literacy mechanism among the respondents.

- To give suggestions to improving the Information literacy skills among the women respondents.

7. RESEARCH METHODOLOGY:

For the present study, the Explorative Method of research was adopted to know the level of Information Literacy among Women about Health and Family Welfare Programme Schemes.

The Structured Questionnaire was used as a data collection tool from the target study population. The Structured Questionnaire has been designed on the topic, objectives and hypothesis of the study. Questionnaire basically covers personal characteristics, profile of respondents, Information Needs, services and Health Programmes of State and Central Government Schemes awareness, use level of Information and Level of Information Literacy skills among the respondents. The women of the Ballari District were the target population of the present study. The Stratified Sampling Method was used to deriving sample form the population.. Further, survey method of research (Women of seven talukas of Ballari District) was applied and collected the data on Information Literacy rate among the target population with respect to State and Central Gov. Health and Family Welfare Programmes Schemes.

Later the primary data so collected from the questionnaire has been analyzed and tabulated in the following section with help of excel and SPSS software.

8. ANALYSIS AND INTERPRETATION:

Personal characteristics profiles of respondents and their Need of Information about health and family welfare Programmes.

Table-1 Distribution of the sample and Response

Domicile	No of Distributed Questionnaires	Received	Percentage
Rural	50	48	48%
Urban	50	48	48%
Total	100	96	96%

The data in table 1- Shows the distribution of samples and response rates of the respondents under the study. A total of 100 structured questionnaires were designed and 50 questionnaires were distributed each for rural and urban. Out

of which 96 completely filled questionnaires were received with response rate of 96%. Further, among 81 literate respondents 15 illiterate respondents were interviewed and collected for the information for the study.

Table- 2 Age wise Distribution of Respondents

Age	No of Respondents	% age
21 to 30	28	29.2
31 to 40	42	43.8
41 to 50	10	10.4
51 to 60	14	14.6
Above 60	2	2.1
Total	**96**	**100.0**

`Data in table-2indicates in higher percentage (43.8%, N=42) of the respondents in the age group of 31-40 years. followed, by the those in the younger age group of 21-30, (29.2%, N=28).The representation of other age group is relatively lower with minimum number of respondents (14.6%, N=14), (10.4%, N=10) belongs to the age group of 41-50years and 51-60 years respectively, very few of respondents from older age group i.e. 60 years (2.1%, N=2). It indicates that the representation of older age group of the women very less in the study.

Table- 3 Educational qualification wise distribution of population

Education Level	No of Respondents	% age
Illiterate	15	15.6
Primary	33	34.4
High school	10	10.4
PUC	10	10.4
Graduation	22	22.9
PG	6	6.3
Total	**96**	**100.0**

The education level of women under the study as indicated in the table- 3 it is observed that higher percent (N=33, 34.4%) of the study population have primary education, followed by those have graduation (22.9%, N=22), and 15.6% (N=15) of the study population have been reported as illiterate, High school and PUC Education level respondents in third majority among the respondent (10.4%, N=10) each. While, (6.3%, N=6) very small portion of the study population have P.G. degree. It can be analyzed that majority of the population have low education status.

Table-4 Religion wise distribution of population

Religion	No of Respondents	% age
Hindu	80	83.3
Muslim	6	6.3
Christian	8	8.3
Jain	2	2.1
Total	**96**	**100.0**

Women respondents under the study have been categoried into different religion like Hindu, Muslim, Christian and Jain. It is found from table-4 the population comprises of 83.3 %,(N=80) of Hindu, 8.3%, (N=8) of Christian, 6.3%, (N=6) of Muslim and only 2.1%, (N=2) of Jain. It can be analyzed from the above discussion that, large majority of the population belongs to Hindu religion.

Table-5 Occupation wise distribution of study population

Occupation	No of Respondents	% age
Private	4	4.2
House maker	45	46.9
Agriculture	4	4.2
Labour	12	12.5
Self-employee	25	26.0
Government and Semi Government	6	6.3
Total	96	100.0

Table -5 give the picture of respondents occupation, House maker (46.9%, N=45) constitute a large proportion of study population. More than 26%, (N=25) of women are self-employed. Very small percentage (6.3%, N=6) of women are Government / Semi Government employees. Representation from Agriculture sector (4.2%, N=4) and Private sector (4.2%, N=4) are very less as compared to others. It can be analyzed that majority of the population are less educated. Hence, may be the reason for being house makers.

Table-6 Income wise Respondent distribution of study population

Income of respondent	No of Respondents	% age
Below 10000	59	61.5
10000 to 20000	17	17.7
20000 to 30000	12	12.5
50000 to 60000	2	2.1
Above 60000	6	6.25
Total	**96**	**100.0**

In Table-6, it can be observed that, large majority of the population (61.5%, N=59) have less than Rs.10000/- income. Significant number of (17.7%, N=17) of respondents women having income in between Rs.10000/- to 20000/-. Another 12.5% (N=12) of the women respondents have income in between Rs.20000/- to 30000/-. Hardly, 6.25% (N=6) of respondents have income of Rs. 60000/- and above Rs. 60000/-. It can be analyzed from above discussion that the annual income of the respondents is quit low. Since, majority of the respondents of women are house makers. However, they have indirectly contributed to the family income.

Table-7 Domicile representation of study population

Domicile	No of Respondents	% age
Rural	48	50.0
Urban	48	50.0
Total	**96**	**100.0**

It is observed from table-7that equal No of representation is given for each Urban and Rural area each with 50% of response.

Table-8 Social Status: Category wise distribution of study population

Social Status	No of Respondents	% age
GM	31	32.3
OBC	25	26.0
ST	11	11.5
SC	11	11.5
Minority	18	18.8
Total	96	100.0

The women respondents under the study have been divided into different social classes like, GM, OBC, SC/ST and Minority. It is observed from table-8 that the study population comprises of 32.3% (N=32) of GM, 26 %,(N=25) of OBC, 1.5% (N=11) of SC, 11.5% (N=11) of ST and 18.8% (N=18) of minority respectively. It can be analyzed with above analysis that majority of the population either belongs to GM or OBC.

Table-9 Language known by the respondents of the study population

Language	No of Respondents	% age
Kannada	96	100
English	8	8.3
Hindi	14	14.6

Telugu	14	14.6
Tamil	10	10.4
Urdu	10	10.4

Local language of Kannada happens to be the mother tongue, for the large majority of respondents (100%, N=96) followed by small number of respondents speaks Telugu and Tamil (14.6%, N=14) and still less number of respondents known English language (8.3%, N=8). Finally it can be concluded that mother tongue Kannada known by all the respondents.

Table-10 Marital status wise distribution of study population

Marital Status	No of Respondents	% age
Unmarried	20	20.8
Married	74	77.1
Widow	2	2.1
Divorce	0	0
Total	**96**	**100.0**

It can be analyzed from table-10 that greater majority of the study population (77.1%, N=74) under study are married and while, 20.8%, (N=20) of the respondents are unmarried. Very small proportion (2.1%, N=2) of the study population are widow. However, no cases have been reported from Divorce or separated cases.

Table-11 Type of family of respondents of study population

Type of family	No of Respondents	% age
Joint Family	49	51.0
Nuclear Family	47	49.0
Total	**96**	**100.0**

Table -11 shows type of family of the respondents. It is observed that 51 %(N=49) of respondents belong to Joint family system and remaining 49% (N=47) respondents are from Nuclear family. It is observed that equal representation is given for both joint and nuclear type of family.

Table- 12 Facility availed by respondent family under the study

Facility	No of Respondents	% age
APL Card	35	36.5
BPLCard	38	39.6
Anthyodaya	11	11.5
None of the above	12	12.5
Total	**96**	**100.0**

The respondents under the study were asked to know the facilities availed by the respondents from Government. It is observed that large majority of the study population (39.6%, N=38) have possesses BPL cards. While, 36.5%, (N=35) of the respondents have APL cards. However, 11.5% (N=11) of the respondents have Anthyodhaya cards. But it is surprisingly note that 12.5% (N=12) of the respondents do not have BPL, APL or Anthyodhaya cards. It can be concluded that majority of the study population either have APL card and BPL card.

Table-13 Opinion about Concept of Health

Health concept	No of Respondents	% age
State of complete Physical fitness	80	83.3%
Mental fitness	28	28.2%
Social wellbeing	28	28.2%
Above all	18	18.8%

To know the health concept understood by the respondents under the study, a question was asked about the meaning of health concept. The options have been listed out as shown in the table-14. It is observed that greater majority (83.3%, N=80) of the population understood health as a state of complete physical fitness. While, 28.2% (N=28) of the respondents opined as Mental fitness or Social Wellbeing. However, significant number of women respondents expressed health is Physical, Mental, and Social Fitness.

Table-14 Availability of Health Center in the Locality

About Hospital	No of Respondents	% age
Availability Health Center	73	76.0
Not availability Health Center	23	24.0
Total	**96**	100.0

Table -14 shows the availability of health center in their locality. Majority of the respondents (76.0%, N=73) under study opined that Health center is available in their locality. However, (23.0%, N=23) respondents felt that health center is not available in their locality.

Table-15 Opinion about Services of the Health Center

Opinion health services	No of Respondents	% age
Yes	69	71.9
No	27	28.1
Total	**96**	**100.0**

Table-15 reveals the respondent opinion regarding the health services provided by health center. It is found that as many as more than 71.9 %(N=69) respondents opined that health centers are provided health services. While, 28.1% (N=27) respondents felt that health centers does not provide health services. Hence, it can be concluded that majority of the health centers are providing Health services to the public.

Table- 16 Concept of Health Information Literacy

Conceptualization	No of Respondents	% age
Identifying the needed information	75	78.1%
Determine all possible sources	44	45.8%
Awareness and Accessibility	41	42.7%
Use of extracted information for their base knowledge	37	38.5%
Evaluate the info about Ethical use	39	40.6%

Respondents were asked about the information literacy concept in an order. It is observed from table 16 that Majority of the respondents have an ability to identify the needed information (78.1%, N=75). More than 45.8% (N=44) of the respondents have an ability to list out all the possible sources required for them. Another42.75 %(N=41) of the respondents have aware and accessible to needed information. While, 38.5% (N=37) of the respondents have an ability to use the extracted information for their base knowledge. Finally 40.6% (N=39) of the respondents have a ability to evaluate and use ethically the needed information. When we calculate the average percentage of Information Literacy skills and competency among the respondents, it is found to be 49.14%. Which indicates that the information literacy skill below 50% among the respondents under the study. It can be concluded that some efforts should be made to take some measures to enhance the health information literacy among women in the form of health education awareness programs/ Seminar/Conference/ Wall writings and Health Camps etc.

One of the main objectives of the study was to identify the type of information required by the women respondents under the study. The questions were asked in the five points liker scale in the range of very high preferred information too not all. As many as 18 were required health information have been listed out as shown the table -17. The mean scores have been calculated base on scale values multiplied with corresponding frequency and summed up the all product then divided by

Table-17 Type of Information required by the respondent

Sl.NO	Information	Need Priority					Total	Mean
		5 Very High	4 High	3 Moderate	2 Average	1 Not all		
1	General Health	69(71.9%)	10(10.4%)	---	---	17(17.7%)	402	4.188
2	Ensured nutritious food and essential health services	71(74.0%)	21(21.9%)	---	---	4(4.2%)	443	4.615
3	Health and various programs of Govt.	60(62.5%)	12(12.5%)	9(9.4%)	---	15(15.6%)	390	4.063
4	Information Sources	41(42.7%)	8(8.3%)	7(7.3%)	---	40(41.7%)	298	3.104
5	Services in health	72(75.0%)	9(9.4%)	---	---	15(15.6%)	411	4.281
6	Mother and Child health care	73(76.0%)	7(7.3%)	----	---	16(16.7%)	409	4.260
7	Family welfare	57(59.4%)	2(2.1%)	---	---	37(38.5%)	330	3.438
8	Rural health	62(64.6%)	---	---	---	34(35.4%)	344	3.583
9	Service facilities in Primary health Centre	69(71.9%)	7(7.3%)	---	---	20(20.8%)	393	4.094
10	Community Health Centre services	49(51.0%)	9(9.4%)	---	---	38(39.6%)	319	3.323
11	Donate blood	70(72.9%)	7(7.3%)	---	---	19(19.8%)	397	4.155
12	Health care of Elderly members of family	66(68.8%)	15(15.6%)	---	---	15(15.6%)	405	4.219
13	Adolescent Reproductive and Sexual Health.	65(67.7%)	11(11.5%)	2(2.1%)	---	18(18.8%)	393	4.094
14	Anemia	65(67.7%)	7(7.3%)	---	---	24(25.0%)	377	3.927
15	Organ Transplant	72(75.0%)	2(2.1%)	---	---	22(22.9%)	390	4.063
16	Reproductive Maternal Neonatal child Health	62(64.6%)	16(16.7%)	---	---	18(18.8%)	392	4.083
17	Iodine Deficiency Disorder	9(9.4%)	---	---	2(2.1%)	85(88.5%)	134	1.396
18	Water and Sanitation	86(89.6%)	---	---	---	10(10.4%)	440	4.583

sample size (n=96). It is observed from table-18 that Ensured nutritious food and essential health service (X_1=4.61), Water and Sanitation (X=4.58) services in health (X=4.28), Mother and Child health care(X=4.2) and Health care of Elderly members of family (X=4.219) are emerged as highly preferred health information among the respondents. While, General Health Information (X=4.188), Donate Blood Service, (X=4.155), Facilities in primary health Center (X=4.094), Adolescent Reproductive and Sexual Health (X=4.083) and Reproductive Maternal Neonatal Child Health are medium preferred required health information among the women respondents. However, Organ Transplant (X=4.063), Anemia (X=3.927), Family Welfare (X=3.583), Community Health Center (X=3.323), Information Sources (X=3.104) and Iodine Deficiency Disorder (X=1.396) are the least preferred health information for the respondents under study. It can be concluded that nutritious food and essential health service, Water and Sanitation and Mother and Child health care are the most preferred health information and Community Health Center, Iodine Deficiency Disorder are the least preferred information among the women respondents in Ballari district.

Table-18 Awareness of Health and family welfare Programmes

Answer	No of Respondents	% age
Yes	96	100%
No	0	00
Total	**96**	**100.0**

It is found from the table- 18 that all the respondents under the study are aware about Health and Family Welfare Programs initiated by State and Central government.

9. Extent of Awareness of Health and Family Welfare Programs

One of the main purposes of the study was to know the awareness level of health and family welfare programmes among the women respondents under the study. In this regard the question was asked in the five point scale in the range of most aware to not at aware. The mean scores have been calculated base on scale values multiplied with corresponding frequency and summed up the all product then divided by sample size (n=96). It is observed from table-22 that respondents are aware of Bhagyalaxmi scheme(X_1=4.84),Madilu(X_2=4.79), Family Planning Program(X_3=4.71), 108 ArogyaKavacha (X_4=4.67), ThayiBhagya (X_5=4.60),are emerged as highly aware of health and family welfare schemes among the respondents. While,Janani Suraksha yojane (X = 4.48), Prasooti Ariake (X=4.39), School Health Programe(X=3.92)are medium preferred aware of health information

among the women respondents. However,Vajpayee ArogyashreeYojane(X=3.58), Rastriya Balaswastayojane (X=3.30), Rajiv Gandhi ArogyaYojane (X=3.25), National rural health mission(X=3.14) andNational urban health mission(X=3.02) are the least aware of health and family welfare schemes among the respondents under study. It can be concluded that Bhagyalaxmi scheme, Madiluare are the most aware and National rural health mission, National urban health missionary the least aware information among the women respondents in Ballari district.

10. Extent of use of Health and Family Welfare Programs

It is about use of various health and family and welfare schemes used by the women respondents under the study. The question was asked in the five point scale in the range of very highly used to not at used. The mean scores have been calculated base on scale values multiplied with corresponding frequency and summed up the all product then divided by sample size (n=96). It is observed from table-23 that Family Planning Program (X=4.833), Madilu(X=4.792), Bhagyalaxmi scheme(X=4.771), 108 Arogyakavacha(X=4.688) and Thayibhagya(X=7.479), are most extensively used schemes by the respondents under study. While, Janani surakshayojane (X=4.458), School health program(X=3.959), Vajapeyi Arogyashreeyojane (X=3.545), are medium used schemes by the women However RashtriyaBalaswastaKaryakarma(X=3.479).

Rashtriya Balaswasta Karyakarma (X = 3.479). However, Rajivgandhi Arogyayojane (X = 3.146), National Health Mission (X = 3.094), Madilu and Rajivgandhi Arogyayojane, National urban health machine (X = 2.948) are the least used health and family welfare schemes by the respondents under study. It can be concluded that Family Planning Program Madilu and Bhagyalaxmi were the most extensively used health and family welfare schemes.

11. Major findings of the study:

- Higher percentage (43.8%, N=42) of the respondents in the age group of 31-40 years.
- Higher percent (N=33, 34.4%) of the population have primary education, followed by those have graduation (22.9%, N=22)
- The population comprises of 83.3 %,(N=80) of Hindu, 8.3%, (N=8) of Christian, 6.3%, (N=6) of Muslim and only 2.1%, (N=2) of Jain.

- House maker (46.9%, N=45) constitute a large proportion of population.
- Majority of the population (61.5%, N=59) have less than Rs.10000/- income
- The population comprises of 32.3% (N=32) of GM, 26%, (N=25) of OBC, 1.5% (N=11) of SC, 11.5% (N=11) of ST and 18.8% (N=18) of minority respectively.
- Of Kannada happens to be the mother tongue, for the large majority of respondents (100%, N=96)
- That greater majority of the population (77.1%, N=74) under study are married and while, 20.8%, (N=20) of the respondents are unmarried.
- Large majority of the population (39.6%, N=38) have possesses BPL cards. While, 36.5%, (N=35) of the respondents have APL cards.
- Greater majority (83.3%, N=80) of the population understood health as a state of complete physical fitness.
- Majority of the respondents have an ability to identify the needed information (78.1%, N=75). More than 45.8% (N=44) of the respondents have an ability to list out all the possible sources required for them.
- It is observed from table-18 that Ensured nutritious food and essential health service (X_1=4.61), Water and Sanitation (X=4.58) services in health (X=4.28), Mother and Child health care(X=4.2) and Health care of Elderly members of family (X=4.219) are highly preferred health information areas among the respondents.
- On an average, 49.14% of information literacy skill found among the respondents under the study.

12. RESPONDENTS REMARKS:

- Health and family welfare information is very much required
- Government should provide health education in rural area through mass media, like documentary film, street drama etc.
- Women's demanded simple mechanism, Just similar to Adhar, life time health card for ever to get benefit of health services

- Illiterate women suggested sign boards to be in pictorial in the hospitals to overcome language barrier.

13. CONCLUSION:

- Information is an important tool for the health. The present situation for women is more challenging to upgrade their knowledge and update their Information Literacy skills. Literacy skills to be extend for specially women to being in equity among the society about health. It is an indicator of development. It is basic need of Human life .Human resource is wealth of the nation to keeping in this view information role is pivotal in the development.
- The results of the study have highlighted many facets about the health information needs of women. The results also support the findings and observation of Chandra, Metaguda and Vijay, Naik A (2012) RathnaBandyopdhya (2009) Kumar, A (2005). In this article it is found that need of health information is felt more. Information Literacy among the rural women is more aware but in usage process difficulty they expressed. It makes clearly need of Literacy skills in a position of the prioritizing sector. Substantially high educated level urban women an economically strong, especially who have not so much aware and not interested to use the programmes, besides they expressed need of information.
- It is found to be 49.14%. Which indicates that the information literacy skill below 50% among the respondents under the study. It can be concluded that some efforts should be made to take some measures to enhance the health information literacy among women in the form of health education awareness programs Seminar, Conference, Wall writings and Health Camps.

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INVOLVEMENT OF USERS IN COLLECTION DEVELOPMENT PROCESS OF AGRICULTURAL UNIVERSITY LIBRARIES OF HARYANA, PUNJAB AND HIMACHAL PRADESH

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Abstract: This present study highlights the role and needs of users as key factor while planning collection development policy/process in a few north Indian agricultural and technological universities of Haryana, Punjab And Himachal Pradesh. Data was collected through a well structured questionnaire and interview method from the PG Students, Research Scholars and Faculty. It was found that in every agricultural university library; only faculty members recommend the reading material for library. Research scholars and PG students in a very small number recommends through their teachers as they are not given the privileges to recommend reading material for library. While recommending reading material, print selection tools are most used than electronic tools. Faculty members are provided more assistance of library staff than students while recommending reading material for purchase.

1. INTRODUCTION

As the quality of teaching and research of a university depends upon the quality of information services provided by its library to its user community, the aim of a university library should be to build an adequate and balanced collection to meet the ever changing needs and demands of the target audience. So that, the collection of library could satisfy teaching, research and other multifarious needs of the students and faculty members and help them to keep abreast of new developments in their field. Thus, collection development of a university library should be need based in term of quality and quantity.

Keeping in view of the limited funds available, increasing informational needs of user community and several lacunas existing, the collection development in libraries must be carefully and systematically planned in accordance with the mission, objective,

scope of university programmes.

2. NEED OF THE STUDY

In Indian Agricultural Universities, there is not any policy document framed for collection development. In collection development process of any university the User is considered the main factor as the all type of collection is developed for user community of any university. The present study has been conducted to understand the role and need of Users while framing collection development policy of any library.

3. OBJECTIVES

The proposed study on library collection development in the agricultural university libraries of Haryana, Punjab and Himachal Pradesh has been planned with the following objectives:

- To know involvement of users in selection process of reading material for development of collection of the Agricultural University Libraries.
- To assess the use of different type of selection tools available in print and electronic modes while recommending reading material.
- To know the users' frequency of purchase the recommended reading material
- To recognize the assistance of library staff to users in selection of reading material

4. SCOPE

The scope of the present study is limited to PG students, research scholars and faculty of Chaudhary CCS Haryana Agricultural University, Hisar (Haryana), National Dairy Research Institute, Karnal (Haryana), Punjab Agricultural University, Ludhiana (Punjab), Guru Angad Dev Veterinary & Animal Science University, Ludhiana (Punjab), CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur (Himachal Pradesh), Dr Yashwant Singh Parmar University of Horticulture & Forestry, Solan(Himachal Pradesh). Out of these 6 agricultural university only NDRI, Karnal is Deemed Agricultural University (DAU) rest of 5 universities are State Agricultural Universities.

5. METHODOLOGY

The data used in the present the study was collected through the survey conducted in 2011. Questionnaire method was used to collect the responses of the users regarding involvement of users in collection development process of a few selected agricultural university libraries of North India. For the statistical analysis of user data the software package "Statistical Package for Social Reviews (SPSS)"was used.

6. DATA ANALYSIS AND PRESENTATION

Collected data has been presented in tabular form and analysed using statistical techniques where required:

Table 1 Category wise response of users in agricultural universities

Category	Response received N (%)
M. Sc.	204 (78.76)
Ph. D	84 (92.31)
Faculty	226 (90.40)
Total	514 (85.67)

Table 1 shows the response of different category of users in agricultural university libraries. Overall, 85.67 (N=600) percent users responded to the questionnaire. Among all these respondents (N=514), maximum number of respondents were research scholars (92.31 percent) followed by faculty members (90.40 percent) while relatively a less number or a little more than three fourth of the PG students (78.76 percent) responded to the questionnaire.

Table 2 Users' recommendation of reading material

Frequency	Status			Total N (%)	χ^2, d.f.
	PG N (%)	RS N (%)	Faculty N (%)		
Always	9 (4.4)	12 (14.3)	37 (16.4)	58 (11.3)	1.502*, 8
Often	14 (6.9)	9 (10.7)	52 (23.0)	75 (14.6)	
Sometimes	25 (12.3)	23 (27.4)	81 (35.8)	129 (25.1)	
Rarely	42 (20.6)	20 (23.8)	41 (18.1)	103 (20.0)	
Never	114 (55.9)	20 (23.8)	15 (6.6)	149 (29.0)	
Total	204 (100.0)	84 (100.0)	226 (100.0)	514 (100.0)	

Table 2 shows the different frequencies of recommendations for reading material by different type of users of selected agricultural libraries. It is clear from the above table that more than half of the PG students (55.9 percent) never recommended reading material in libraries. Less than one fourth of PG students (20.6 percent) recommended rarely while a very few recommended always (4.4 percent) or often (6.9 percent).

More number of research scholars (27.4 percent) recommended reading material sometimes. While similar number of research scholars (23.8 percent) recommended rarely or never. A small number of research scholars recommended always (14.3 percent) or often (10.7 percent).

A large number of faculty (35.8 percent) in agricultural universities recommended reading material sometimes. Almost one fourth of faculty often recommended library material. While there was a very small number of faculty members (6.6 percent) who never recommended reading material in agricultural libraries.

It is apparent from the above table that among all category of users, more faculty mem-

bers recommended for library material. More number of faculty and research scholars recommended reading material sometimes while majority of PG students never recommended reading material in agricultural libraries. When response of first two scales is combined it becomes very clear that more faculty (39.4 percent) always or often recommended for reading material while 25 percent research scholars and only 10 percent PG students recommended for reading material always or often.

When the response was statistically tested it was found significantly different that indicates that different type of users recommended reading material differently. It is due to the reason that the faculty in agricultural university libraries were competent to recommend the needed reading material while PG students and research scholars had to convince their teachers to recommend their required reading material.

Table 3 Sources and selection tools used while recommending reading material

Sources and tools	Status (N=365)						Total N (%)		χ^2, d.f.
	PG N (%)		RS N (%)		Faculty N (%)				
	Yes	No	Yes	No	Yes	No	Yes	No	
In Print form									
Exhibitions/ Book fairs	36 (40.0)	54 (60.0)	40 (62.5)	24 (37.5)	136 (64.5)	75 (35.5)	212 (58.1)	153 (41.9)	16.119*, 2
Reviews	20 (22.2)	70 (77.8)	34 (53.1)	30 (46.9)	115 (54.5)	96 (45.5)	169 (46.3)	196 (53.7)	27.894*, 2
References cited in journals	23 (25.6)	67 (74.4)	30 (46.9)	34 (53.1)	97 (46.0)	114 (54.0)	150 (41.1)	215 (58.9)	11.934*, 2
Publishers catalogues	11 (12.2)	79 (87.8)	18 (28.1)	46 (71.9)	73 (34.6)	138 (65.4)	102 (27.9)	263 (72.1)	15.687*, 2
Distributor's stock list	7 (7.8)	83 (92.2)	13 (20.3)	51 (79.7)	75 (35.5)	136 (64.5)	95 (26.0)	270 (74.0)	26.582*, 2
Books received on approval	6 (6.7)	84 (93.3)	5 (7.8)	59 (92.2)	64 (30.3)	147 (69.7)	75 (20.5)	290 (79.5)	29.352*, 2
Subject bibliographies	6 (6.7)	84 (93.3)	12 (18.8)	37 (17.5)	37 (17.5)	174 (82.5)	55 (15.1)	310 (84.9)	6.645, 2
News papers	5 (5.6)	85 (94.4)	5 (7.8)	59 (92.2)	40 (19.0)	171 (81.0)	50 (13.7)	315 (86.3)	11.859*, 2

Books in Print	7 (7.8)	83 (92.2)	7 (10.9)	57 (89.1)	30 (14.2)	181 (85.8)	44 (12.1)	321 (87.9)	2.560, 2
Ulrich periodical directory	2 (2.2)	88 (97.8)	4 (6.2)	60 (93.8)	16 (7.6)	195 (92.4)	22 (6.0)	343 (94.0)	3.837, 2
Any other (Colleagues and friends)	8 (8.9)	82 (91.1)	9 (14.1)	55 (85.9)	4 (1.9)	207 (98.1)	21 (5.8)	344 (94.2)	15.571*, 2
In Electronic form									
Free hits on Internet	27 (30.0)	63 (70.0)	32 (50.0)	32 (50.0)	102 (48.3)	109 (51.7)	161 (44.1)	204 (55.9)	9.701, 2
Google books	24 (26.7)	66 (73.3)	19 (29.7)	45 (70.3)	42 (19.9)	169 (80.1)	85 (23.3)	280 (76.7)	3.394, 2
Amazon.com	7 (7.8)	83 (92.2)	19 (29.7)	45 (70.3)	32 (15.2)	179 (84.8)	58 (15.9)	307 (84.1)	13.630, 2
ISBN database.com	0 (0.0)	90 (100.0)	4 (6.2)	60 (93.8)	18 (8.5)	193 (91.5)	22 (6.0)	343 (94.0)	13.278*, 2
BooklistOnline.com	0 (0.0)	90 (100.0)	3 (4.7)	61 (95.3)	16 (7.6)	195 (92.4)	19 (5.2)	346 (94.8)	11.791*, 2

Table 3 shows the sources and selection tools used by users while recommending reading material. Out of total, 71.01 percent users responded to this question. Overall, among all the selection tools in print form to recommend reading material, more than half the users (58.1 percent) recommended library material through exhibition/book fairs followed by using reviews (46.3 percent), references cited in journals (41.1 percent), publishers catalogues (27.9 percent), distributor's stock list (26.0 percent), books received on approval (20.5 percent each), subject bibliographies (15.1 percent), newspapers (13.7 percent), Books in print (12.1 percent) and Ulrich periodical directory (6.0 percent).Another option "Any other" was also included in the questionnaire in which only 5.8 percent user responded for 'colleagues and friends'.

First three most used print selection sources or tools by PG students to recommend reading material were exhibitions/book fairs (40.0 percent), references cited in journals (25.6 percent) and reviews (22.2 percent). Research scholars and faculty mostly used exhibitions/fairs (62.5 percent research scholars and 64.5faculty), reviews (53.1 percent research scholars and 54.5 percent faculty) and references cited in journals (46.9 percent research scholars and 46.0 percent faculty).

Taking e-resources as tools to recommend reading material, overall among all the selection tools in electronic form to recommend reading material, free hits on Internet was used by most of the users (44.1 percent) followed by google books (23.3 percent), amazon.com (15.9 percent), ISBN database.com (6.0 percent) and booklistonline.com (5.2 percent). PG students mostly used free hits on Internet (30.0) and google books (26.7 percent). Research scholars' mostly used tools in e-format were free hits on Internet (50.0 percent) and google books as well as amazon.com (29.7 percent each) while mostly used electronic selection tools by faculty were free hits on internet (48.3 percent) distantly followed by google books(19.9) to recommend reading material for library. There were four more options included and they were British Library Catalogue, Library of Congress Catalogue, Book Wire and any other but these options were not responded by the users.

It is apparent from the above table that print selection tools were more used than electronic selection tools. In print selection tools exhibition/ book fairs, reviews and references cited in journals were mostly used by faculty and research scholars while PG students consulted colleagues and friends also to recommend reading material. In electronic selection tools, free hits on Internet and google books were most used for recommending reading material.

When the response of exhibitions/ book fairs, reviews, references cited in journals, publishers catalogues, distributor's stock list, books received on approval, newspapers, ISBNdatabase.com, booklistOnline and colleagues and friends was statistically tested they are found significantly different indicating that users had differently used these tools to recommend reading material. The difference may be due to the involvement of different category of users who had different levels of academic experience. The response of Books in Print, Ulrichs Periodical Directory, subject bibliographies, free hits on internet, googlebooks and amazon.com was found significantly not different indicating that they similarly used different selection tools to recommend reading material.

Table 4 Frequency of purchase the recommended reading material

Frequency	Status			Total N (%)	χ^2, d.f.
	PG N (%)	RS N (%)	Faculty N (%)		
Always	14 (15.6)	17 (26.6)	35 (16.6)	66 (18.1)	56.346*, 8
Often	15 (16.7)	13 (20.3)	45 (21.3)	73 (20.0)	
Sometimes	16 (17.8)	19 (29.7)	(95 (45.0)	130 (35.6)	
Rarely	30 (33.3)	3 (4.7)	27 (12.8)	60 (16.4)	
Never	15 (16.7)	12 (18.8)	9 (4.3)	36 (9.9)	
Total	90 (100.0)	64 (100.0)	211 (100.0)	365 (100.0)	

Table 4 shows the frequencies of purchase of reading material recommended by different type of users in agricultural libraries. It is clear from the above table that recommended reading material of more PG students (33.3 percent) was rarely purchased. Recommended reading material of 17.8 percent PG students was sometimes purchased followed by often purchased (16.7 percent). Almost similar number of PG students (15.6 percent) said that their recommended reading material was purchased always.

Recommended reading material of more research scholars (29.7 percent) was purchased sometimes while recommended documents of almost same number of research scholars (26.6 percent) were purchased always.18.8 percent of research scholars gave negative response to this question while a very small number (4.7 percent) said that their recommended reading material was rarely purchased. Reading material recommended by almost half of the faculty (45.0 percent) was purchased sometimes, followed by often (21.3 percent) and always (16.6 percent).

It is apparent from the above table that among all type of user categories, recommended reading material of more faculty members was purchased. When response of first three

frequencies is combined it becomes very clear that recommended reading material by a very good strength of faculty (82.9 percent) and research scholars (76.6 percent) while half of PG students was purchased always, often and some times. That indicates a positive response of users about the purchase of their required reading material by libraries.

When the response was statistically tested it was found significantly different that indicates that different type of users had responded differently regarding the purchase of their recommended reading material. It is again due to the reason that the faculty in agricultural university libraries were competent to recommend the needed reading material while PG students and research scholars had to convince their teachers to recommend their required reading material.

Table 5 Assistance of library staff in selection of reading material

Frequency	Status (N=359)			Total N (%)	χ^2, d.f.
	PG N (%)	RS N (%)	**Faculty N (%)**		
Always	9 (10.0)	12 (18.8)	69 (33.7)	90 (25.1)	55.228*, 8
Often	15 (16.7)	9 (14.1)	62 (30.2)	86 (24.0)	
Sometimes	20 (22.2)	15 (23.4)	39 (19.0)	74 (20.6)	
Rarely	32 (35.6)	15 (23.4)	22 (10.7)	69 (19.2)	
Never	14 (15.6)	13 (20.3)	13 (6.3)	40 (11.1)	
Total	90 (100.0)	64 (100.0)	205 (100.0)	359 (100.0)	

Table 5 shows the assistance of library staff in selection of reading material. Out of total respondents who recommended reading material for library (N=365)98.36 percent respondents (N=359) responded to this question.

More number of PG students (35.6 percent) had rarely been provided the assistance by library staff followed by sometimes (22.2 percent). Almost same numbers of research scholars were assisted by library staff sometimes or rarely (23.4 percent) whereas 33.7 percent faculty was always assisted by library staff followed by often (30.2 percent).

It is also apparent that almost half the PG students (48.9 percent) and more than half the research scholars (56.3 percent) were assisted at least sometimes by library staff. On the other hand, 63.9 percent faculty was assisted by library staff always or often.

When the response was statistically tested it was found significantly different that indicates that different type of users were assisted differently by library staff in selection of reading material. It may be due to the reason that the library staff could be biased towards the faculty because of their professional relations.

Table 6 Time lag between and recommendation and availability of reading material

Time lag	Status (N=329)			Total N (%)	χ^2, d.f.
	PG N (%)	RS N (%)	Faculty N (%)		
Within one month	5 (6.7)	2 (3.8)	6 (3.0)	13 (4.0)	
Within two months	8 (10.7)	4 (7.7)	34 (16.8)	46 (14.0)	
Within three months	12 (16.0)	13 (25.0)	51 (25.2)	76 (23.1)	
Within six month	20 (26.7)	17 (32.7)	70 (34.7)	107 (32.5)	16.615, 8
More than six months	30 (40.0)	16 (30.8)	42 (20.3)	88 (26.4)	
Total	75 (100.0)	52 (100.0)	202 (100.0)	329 (100.0)	

Table 6 shows the time lag between recommendation of reading material and its availability to users. Out of total respondents who recommended reading material for library (N=365), 90.14 percent respondents responded to this question.

Maximum number of PG students' recommended material was made available to them after a period of more than six months (40 percent) followed by within six months (26.7 percent). Recommended material of research scholars was available to them within six months (32.7 percent) nearly followed by more than six months (30.8 percent) while recommended material of faculty was available to them within six months(34.7 percent) followed by within two months (25.2 percent).

When the response was statistically tested it was found not significantly different that indicates that different type of users' recommended reading material was made available to them within almost similar duration.

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Key Role of Libraries and Library Professionals in the upliftment of individuals and society In the present scenariao

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Abstract: The prime objective of any library (school, college, university) is to meet the academic needs and requirements of the particular institution for which it is really created to serve. Libraries at primary level of education are concerned to pro-create an urge for reading habit that helps in building future career and libraries attached to institutions at higher level enable individuals to conduct research in the required academic discipline. Today libraries play a very important role in building the individuals and the society as it acts as leaders in knowledge management and they enable individual users in learning information handling skills that last through whole lifetime. Libraries aim to organize the resources available in a very systematic way and provide easy access and services that bring in vast changes in teaching, learning and information technology (IT) process. This paper aims to justify the key role of libraries and library professionals in the upliftment of individuals and the society in the present scenario.

Keywords: Libraries, Library Professionals, Individuals (Users), Society.

1. introduction:

Libraries attached to any educational systems today play a very important role as it enables to build individuals who work independently; it enables every individual to utilize any resources (Books, Equipment, and Computers etc.) available in library in a very systematic way. Libraries today support the necessary educational efforts by providing information, teaching resources and referral services. In order to make libraries more active and effective, initiatives are being taken by the library professionals to conduct educational classes or one-to-one tutor programs. Libraries today are not confined to just the educational centre's but also various efforts are being made to outreach the needs and requirements of other specific groups by providing and distributing the resource materials for those at institutions such as prisons, hospitals, rehabitation centers, and group homes(elderly and disabled) etc.

2. HISTORICAL BACKGROUND:

It is the human's quest for more and more knowledge everyday that has really led to enormous creation of information and thus in turn has led to accumulation of tremendous amount of information. The quest for knowledge however is not really a new concept but has taken place since the existence of dawn of civilization to the existing modern information age. The quest for knowledge since earlier days has never been satisfied at all and has never seen ending as it really has no bounds and limits. The hard earned knowledge and information of previous generation is very much valuable for the future and the entire mankind and hence thus is liable to be preserved by proper means. With the invention of paper, man earlier has been able to convey knowledge to others by writing books. But due to lack of proper means of preservation, many of the valuable manuscripts written by many wise men of the earlier times have been destroyed. However next with the invention of printing press process, it became easier to preserve knowledge of earlier times through the form of printed books. This led to larger and larger generation of books which in turn led to the need for preservation and dissemination of information, as a result led to establishment of more and more libraries for preservation and dissemination of information and knowledge. With vast advances happening in science and technology, information explosion has taken place and thus today information is recognized as a very vital source which needs to be preserved and needs to be disseminated in a proper way.

3. DEFINITIONS:

The term library has been derived from the Latin word 'liber' which means books. They act as agencies through which sources of information of accumulated knowledge and experiences are selected, acquired, organized, preserved and finally disseminated to those who are in very much need. Today Library is a collection of sources, resources, and services and structure in which it is housed; it is organized and maintained by a public body, an institution, or a private individual. Thus in general it can be said that library is a building that houses a collection of books and other materials.

- However an advanced definition of Library can be stated as follows:
- "Library is the heart of the institution in which artistic materials such as books, periodicals, news papers, magazines, pamphlets, prints, records and tapes etc. are kept for reading, reference or lending".

4. KEY ROLE OF LIBRARIES IN THE UPLIFTMENT OF INDIVIDUALS AND SOCIETY IN THE PRESENT SCENARIAO:

Libraries today have acquired greater importance in the civilized society for two main reasons namely education and academic research.

- Libraries aim to provide information, teaching resources and providing referral services.
- Libraries aim to cater the needs and requirements of thousands of individual users by providing required information/knowledge to right user in right time.
- Libraries aim to cater the educational, informative research and recreational needs of the users.
- Libraries act as essential tool as it helps in learning process at all levels of education.
- Libraries organize collection and provide access and services that incorporate valuable changes in teaching, learning and information technologies.
- Libraries aim to meet new challenges faced by the individual users by bringing great changes in services.
- Libraries aim to provide educational programmes or classes to users of the library.
- Libraries act as leaders in knowledge management.
- Traditional libraries containing printed documents are undergoing vast changes with advent of computers and telecommunication networks.
- Libraries are transforming into paperless libraries thus creating virtual library i.e. libraries without walls.
- Libraries today are more than a building as they enable collection of books and other material in a more advanced way with the usage of computers and internet.
- Internet facilities in libraries have opened up an avalanche of online and electronic resources for accessing documents on various fields of interest.

5. KEY ROLE OF LIBRARY PROFESSIONALS IN THE UPLIFTMENT OF INDIVIDUALS AND SOCIETY IN THE PRESENT SCENARIAO:

Today library professionals play a very important role in handling libraries and thus help in building relationship between the individual (user) and the resources. Literally in the present scenario library professionals:

- Aim at providing access to information.
- Providing resources available in library to its particular readers (users).
- Aim at providing instruction to individuals through information literacy programs.
- At school level, they perform the role of teachers, information technology specialists, and advocates for literacy.
- Act as managers and information experts.
- Are associated with collection development process.
- Provision and maintenance of information in various forms such as books, periodicals, newspapers, magazines, electronic resources, audio and video recording, maps, manuscripts, photographs and other graphic material etc.
- To provide information, teaching resources and providing referral services.
- Collection of books and other required material in a more advanced way with the usage of computers and internet.

6. CONCLUSION:

Thus from the above it is clear that libraries and library professionals play a key role in the development of the individuals and the society. It is necessary that the library professionals need to update their existing knowledge with new skills and techniques in order to meet the demands of users of library in providing information resources and services.

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Living With Libraries

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"Information, information everywhere,
Use it anywhere to make it useful somewhere"
-Bankapur

Abstract: {*Libraries in the Indian context are referred as Granthalaya, Pustaka Bhandara and Saraswathi Bhandar. It is the mind of man which has to be energized by reading a good book. Libraries are living luminaries of lamps which ignite the hopes of wisdom. People have more easy access to libraries in the digital era as they are living with digital information and services. In fact, the libraries are adding value to cities as they are the knowledge repositories of the future. Living with Libraries is a reality today and library of things are the future perfect smart libraries*}

Keywords: Granthalaya, Pustaka, Bhandara, Saraswathi Bhandar, Library of things, smart mobile phones, digital information, tweets, Alexandria Library, Library Apps, Digital information. Library of things.

1. Introduction:

In Indian context libraries are referred as "Granthalaya", "Pustak Bhandar", "Saraswati Bhandar"(a place where the goddess of learning "Saraswati" resides). Saraswati is a whole repository of knowledge and hence we give her a prominent place at the entrance in libraries. We bow to her to bless us with knowledge.

ॐ भद्रकाल्यै नमो नित्यं सरस्वत्यै नमो नमः ।
वेदवेदङ्गवेदान्त विद्यास्थानेभ्य एव च ॥

The translation of the above shloka is thus :

I always bow to the remover of darkness.Again and again I bow down to Goddess Saraswati who is all the wisdom, including all apendages to wisdom, the highest wisdom and the repository of all knowledge.

Libraries are the repositories of knowldege which cannot be restricted to be only a collection of books or collection centers, they are referred as the Knowledge centre or "*Jnana Bhandara*". Each Libraries are found to have some historical value. Libraries, since ages is conserving knowledge to survive for long for the future. Each village has a library, each city has a library and every education institution has a library, there is no place without libraries in the world. Library is for reading, leisure, education and research and more importantly a social institution for a country to be developed culturally, economically, politically and is deemed to be a centre of knowledge. Man has discovered knowledge preservation will happen only in Libraries through which knowledge transfer to the future is possible. Libraries are part of the future.

Again with reference to another sloka which narrates the importance of mind and books and libraries making a house of knowledge: "***Mano Mayah Ayam Hi Purusha***", the english translation of which is "***Man is all but minds***". The sloka is from"***Brahndaranayaka Upanishad***". What distinguishes man and sets him apart from the animal world is his unconquerable mind. Just as a man takes care of his body by cleaning it periodically, by feeding it properly, by giving rest, in a similar fashion the mind has also to be taken proper care. The cheapest and the best instrument with the help of which the mind could be kept alive is a good book or a lively discussion with an enlightened person. Without the company of these, man's mind starts shriveling and decaying. As Librarians and Information officers it is our business not only to deal with the users and creators of books but also with books and periodicals themselves which are scientillating thoughts of minds. Books, e-books or e-journals make their presence felt everywhere, either they are borrowed online or by visiting libraries as same as the traditional way of using books. Books are used for many reasons and for many benefits. With digital technology, books can be read on your pamtops or kindle readers or smart phones or playbook applications. It is only redefining the libraries to live with digital technologies.

2. Illuminating the cities with libraries: Galaxy of Electric Lamps

We enter the library with folded hands and bow to Goddess Saraswati. Libraries are always a place for repositories of knowledge. In 1972, Stefan Zweig while talking about books during an international book year described books as electric lamps and related book collections as galaxies of electric lamps. Libraries will always be a place for all times. It is a light and energy for all intellectual thoughts.The importance of library for people on the earth is bigger than a mountain, bigger than a sea and no other thing can match it. Information may change its forms but

is always added with new types of repositories in digital mediums making it more advanced and reliable ever since the concept of libraries has developed. The access is easy, " *Libraries are following us"* is a fact endorsed by every user in digital world. Libraries in the West are thriving to build a new mansion of intellectual assets, the importance to libraries is given priority with current technology and building a place for learning, a good example is Alexandria library. The transformation of all kind of knowledge to the patrons at the right time through right mode at the right time is the mantra of libraries always. The Library movement and development over years has historically paved ways for re-establishing them. The numbers of libraries in cities makes us spell bound. Taking Belagavi city in Karnataka as an example, there are 121 school libraries, 85 college libraries, three university libraries and public library systems. Is it not a healthy sign of growing importance of libraries which are thriving to educate the masses? The users' strength, considering atleast 5% of total number of institutions and the population of the city, almost around 1,00,000 lakh users will be the potential users of libraries. The libraries have to be given utmost importance considering the *"number of libraries as strength of the city*" . Say that our cities have 210 libraries and there are no road maps to locate them, then all education institutions and the public library systems should make it a point to involve in such activities that give information about libraries in the cities. The strength of libraries makes visible the resources of rich collections of libraries in cities. 4 C's (***Collaboration,Commuincation, Content, Consumers***) will be the new avatars of libraries. Books were the past,are the present and will be the future of living, understanding the past, present and the future. Libraries therefore are the repositories of such electronic lamps. A city has to be measured with its library strength and numbers. Thus the metrics of a city can be gauged by the presence of libraries. The role of libraries is,

- Bringing closer to books through services , personal communication and with interesting thoughts;
- To see digital technology influence on the implications of the five laws of library science and to be part of digital living;
- To make cities grow with libraries, e.g.:Journal of Library Development is planning to have sign guides in cities about strengths of library.

3. Avatar of Information : Designing Information

"*Aksharas*" are digital now. Print gradually is being replaced with digital letters, (look at an astonishing fact of letters, in digital forms there are more 100 types)

the technology is giving shape to information for use in many forms which is the *"avatar of information"* with digital technology. The first most important thing is the easy presentation of data or information. The digital technology has made life of users very easy with many gadgets helping to store trillions of mbps of information in small spaces like servers to pen drives. Old gadgets like CD-ROMs are losing their relevance as there is problem of inconvenience of carrying and security of keeping it. Many alternative forms have come with changing technology in daily needs. The best in today's requirements are smart phones which may rule the world outclassing the Book readers, Computers and TV- a one-time solution for all purposes. Even the kindle readers will lose their importance with better smart phone solutions. Further new technologies like SNS, mobile apps (Library Apps) are making their presence felt leaving aside other mediums to take back seats, but the content is the same only with different avatars. It was very interesting to note that Library of Congress has started adding to its collections the *"tweets"* as content. Is it not a new content for libraries?

The mission of Libraries has not changed, in fact the need for accomplishment of the mission has grown and information is available in a variety of forms. Information in any form is relevant in digital mode for use. A case study of users at Rani Channamma University Library shows that the students of postgraduate departments use many social media sites and smart phones; the crazy mobile has a crazy way of using it, the best use in library has an alternative document delivery service using mobile camera. The case study shows that 100 % of users use mobile, 75% use smart phones and 70% use WhatsApp and 56 % use RCU Library group which is used for library services. Interesting observation is that mobiles are used for capturing images of the documents they need from the library. 60% use these smart mobiles for capturing images of pages of chapters from books, 30% use for articles from the journals and other 10% for other types of documents. These new smart phones are an advantage for users and comfortable to use, indirectly helping them for self document delivery work.

4. Living with library: Smart libraries

Smart libraries have to come and will come. With sinking space and crowd, people prefer to sit in a library and read. For people who are busy, e-library services come to their help. The libraries are a place for all purposes which is proved beyond a point. Libraries will live long not just with the books but also a place for digital information and digital reading and learning and a gamut of all facilities in modern building and wonderful space for learning and interaction. Hence libraries are:

- A new place in cities where people spend time to know what is new in a library: e-Books, e-gadgets, e-services and smart reading places; Drones used for book delivery in a library.
- A place for harvesting information : e- publication ; centre for e-information in any format available;
- A place for all cultural activities, talks, lectures and many related intellectual work;
- Libraries of things (LOT) V/S Information of things (IOT);
- A library will be an information lab for structuring information and designing services in the future;
- Public library will be people's digital university: work has to catch up and dominate in digital information world and be a part of society.
- Libraries use many digital marketing techniques for promoting use of library. e.g.: Info graphics.

5. Conclusion:

Living with libraries will be the future of people who spend their major time in the libraries in days to come. As libraries are smart places on the earth, they are recognized as the hotspots of the cities. Libraries will be a multi-designated point of access to information. Living with libraries or library of things is interchanged for using information where they want or come to a library for serious intellectual work or perish not for using library. The mantra of success is "Saraswati", the knowledge goddess who bestows her blessings with new avatars of information and knowledge. Ultimately the knowledge is grasped in libraries with thorough and concentrated use. Live with library always. Library of things will be future perfect smart libraries.

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Measuring Library Service Quality Using LibQUAL Approach at Vijayanagar Institute of Medical Sciences Ballari of Karnataka State: A Case Study

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Abstract: The objective of the present paper was to assess the library service quality of Vijayanagar Institute of Medical Sciences, Ballari by using LibQUAL instrument. The LibQUAL instrument was developed in collaboration between ARL and Texas A&M University. It is an effective tool to easily identify service quality from the customer perspective. The LibQUAL instrument is used as a survey tool for data collection. LibQUAL tool data enables to determine two types of gap analyses, which are gap between perception and minimum (Service Adequacy Gap) and the gap between perception and desired (Service Superiority Gap) based on the zone of tolerance concept. The targeted sample was 120 users, out of these, 83 (70%) questionnaires were completed return from the users. Gap analysis theory and radar chart used for analysis of data collected. The result of the study revealed that the level of service quality only across minimum level and do not achieve the customers desired. This study helps to the Vijayanagar Institute of Medical Sciences library for knowing the library user satisfaction level and to improve the service quality to meet the user's expectations for sustainable competitive advantage.

Keywords: Service Quality, Gap Model, LibQUAL, VIMS Library

1. Introduction

Conventional library services offered by medical college libraries have undergone a significant change due to a variety of factors, such as emergence of a wide ranging information sources, rise in users' expectations, rapid development of information technology, global competition in the service sector, digital revolution, different

formats of materials and rising costs of materials, etc. To meet these challenges and survive in the competitive environment, medical college libraries require greater understanding and responsiveness to users' needs. Measurement of quality of library services helps in identifying weak and strong areas as well as decreasing the gap between customers' perceptions and expectations.

However, in order to better serve their users' in the medical college, as well as their parent organizations, they need to listen to the voice of the library users'. One way of 'listening' is through user survey, in this case LibQUAL a survey instrument developed for libraries. It collects data each dimensions challenge on the quality of the services, thus enabling libraries to identify areas in which service levels should be improved.

2. Library Profile

Vijayanagar Institute of Medical Sciences library is established along with the parent institution in the year 1961. The Vijayanagar Institute of Medical Sciences library has one of the finest and advanced facilities for the staff and students. Its total area covers about 2375 Sq mts. The library has a seating capacity of around 300 readers and has sections like, own book reading, post-graduate, undergraduate, teaching staff, current journal, book, video library and librarian and staff section. The library is automated and collaborated with national information network agencies to develop the sharing culture of e-resources and database. It is enriched more than 30,000 volumes of books and subscribed 250 print version journals and e-journals.

3. LibQUAL

As a result of various refinements, the current LibQUAL version measures library service quality through 22 core questions on three dimensions: Affect of service (AS), information control (IC), and library as place (LP).The affect of service (AP) dimension consists of nine questions related to Instill confidence in users, gives individual attention, consistently behave courteously, shows readiness to respond to users, has requisite knowledge, deal with users in caring fashion, understand users' needs, willingly help and dependably users' service problem of library staff in delivering user services. The information control (IC) dimension addresses (through eight questions) focuses on print resources, web content, and equipment., makes electronic resources accessible from home or office, enables the users independently location information, the print and electronic sources user need, it

has modern equipment and easy–to-use access tools for users to independently. The third, library as place (LP) dimension consists of five questions focuses on users' perceptions inspires study and learning, provides quiet space for individual activities, as comfortable and inviting location, a gateway for study, learning and research and community space for group learning and group study.

LibQUAL is also unique in offering a measurement model that tracks users' minimum and desired expectations in addition to users' perceptions of library service quality. Libraries can allocate resources more wisely by focusing on areas where improvements are noticed by library users. LibQUAL can be the foundation for building excellence in library services to enhance the learning outcomes of library users.

The desired and minimum scores establish the upper and lower boundaries of a zone of tolerance within which the perceived scores should float if respondents view service as adequate. This framework allows the use of gap analysis to interpret results. If scores are within the zone of tolerance, the service adequacy gap is positive because users' perceptions are higher than their minimum expectations, although lower than their desired expectations. Conversely, a negative service adequacy gap occurs when perceptions fall below minimum expectations.

4. LibQUAL Challenges

LibQUAL provide a chance to library users to tell where library services need improvement so the library can respond to and better manage their expectations. The library can develop their services that better to meet library users' expectations by comparing library's data with that of peer institutions and examine the practices those libraries that are evaluated highly by their user. Hence library staff members' analytical skills for interpreting and decision making based on the data.

5. Review of Literature

The Duke University Medical Center Library administered the **LibQUAL+™** survey instrument in March 2002. Measures library users' perceptions of service quality and identifies gaps between desired, perceived, and minimum expectations of service. This case study represented the library's decisions regarding participants, approaches used to reach them, problems encountered with the survey, and the results of the data for the health care community (Peterson et al., 2004).

According to Moon (2007) "the use of the LibQUAL+™ survey at Rhodes University has been most valuable". The author also mentioned that LibQUAL+™

was going to fulfill an important function in evaluating the impact of implemented strategies and innovations. The survey was an ideal opportunity for the librarians to listen to what their customers had to say and respond to their comments.

Sunder (2010) conducted a survey to determine expectations and perceptions of the quality of services offered by select university libraries of Hyderabad using LibQUAL +™ .Osmania University was found offering better quality services followed by Hyderabad Central university. The least quality services as perceived by users were in Acharya N.G, Ranga Agricultural University and Jawaharlal Nehru Technological University.

Rehman (2013) evaluated the service quality of university libraries of Pakistan from the user's perspective. The data is collected from 1,473 undergraduate, graduate students and faculty members of 22 Pakistani universities through a locally modified LibQUAL survey in Urdu. Library users rated 22 core survey items of minimum acceptable service quality, desired service quality, and perceived service quality. Study findings indicated that libraries overall did not meet users' minimum acceptable and desired levels of service quality. The zone of tolerance identified eight problematic services, most of which were related to the information control dimension. This study also indicated a wide gap between users' perceptions and expectations of service quality.

6. Significance and Need of the Study

The present study played a significant role to identify the area of service quality improvement and to improve the quality of collection development, service effectiveness, workforce competencies and process efficiencies. The present study stresses the librarians and authorities concerned in knowing the level of users' satisfaction, to identify the best practices and to improve the quality of services towards library user's retention and new library members.

7. Objectives of the Study:

The following objectives are framed in the study

- To assess the library service quality using LibQUAL
- To find out the Service Quality Adequacy Gap and Service Quality Superior Gap of 22 core items of LibQUAL three dimensions
- To suggest a set of strategies for bridging the service quality gaps.

8. Research Methodology

A systematic stratified random sampling technique was adopted in the selection of the respondents. Print version LibQUAL used as survey tool for the data collection. It consisted 22 core items grouped under three main dimensions with the comment box. Likert's 1 to 7 scales is used for rating all items on three columns side by side for minimum, desired and perceived scores. 120 questionnaires were distributed among the different library users of the Vijayanagar Institute of Medical Sciences, Ballari like undergraduates, postgraduates and faculty members. Percentage, descriptive statistics, gap analysis theory and radar chart were used for analysis of data collected.

9. Data Analysis and Interpretation:

The collected data has been analyzed with the help of SPSS Statistical Software. According to collected data, 61.45% of the respondents are male and 38.55% respondents' female; majority of the (74.70%) respondents are undergraduates followed by 18.07% of the respondents' post-graduates and 07.23% of the respondents' faculty. The majority of the respondents (68.67%) are in the age group of below 25 years, followed by 18.56% in the age group of above 46 and 12.05 % in the age group of 26-35. However, 04.82% of respondents are in the age group of 36-45 years.

10. Usage of Resources

Table 1: Usage of Frequency of Library Information

Frequency	Usage resources on Library Premises in %	Accessing Library Resources through Library Web page in %	use yahoo, Google or Non-library Gateways for information in %
Daily	79.50	69.87	68.68
Weekly	14.46	31.33	13.25
Monthly	-----	08.43	07.23
Quarterly	03.61	13.25	02.41
Never	02.41	30.12	08.43
Total	100.00	100.00	100.00

Source: Survey data

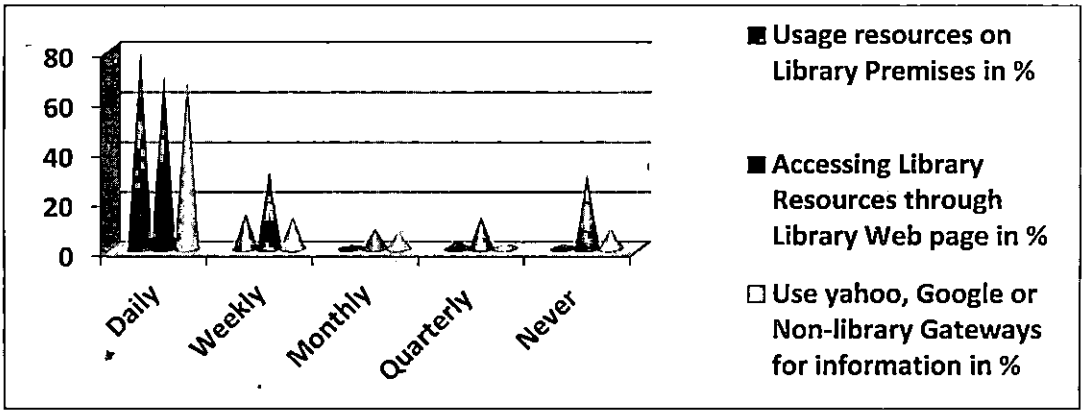


Fig 1: Usage of Frequency of Library Information

The above table-1 shows that majority of the respondents (79.52%) used resources on library premises daily, followed by 14.46 % on a weekly and 3.61% on a monthly basis. However, 2.41% of the respondents never used resources on library premises. Majority (31.33%) of the respondents accessed library resources through web page on weekly basis and followed by 30.12% who never accessed. However, 8.43% of the respondents accessed library resources through web page on monthly basis. Majority (68.68%) of the respondents used the non-library gateways to search for information on a daily basis and followed by 13.25% on a weekly basis. However, 02.41% of the respondents used the non-library gateways to search for information on a monthly basis.

11. LibQUAL Analysis

The 22 core items are grouped into three dimensions of service and means scores are derived for the minimum, desired, and perceived service levels for each dimension. The minimum, perceived, and desired ratings have been used to calculate two kinds of service gaps scores such as **'Service Adequacy Gap' and 'Service Superiority Gap'**. In order to present a graphical view of these dimensions items, the data have been plotted on a radar chart. The data analyzes show the areas for improvement to the medical college authorities so that they give better services to meet the needs of the users.

Table -2 LibQUAL Survey Results – Item Analysis

Item Code	Service Quality Items	Minimum Mean [M]	Desired Mean [D]	Perceived Mean [P]	Service Adequacy Gap [SAG] [P-M]	Service Superiority Gap [SSG] [P-D]
AS	Affect of Service *	4.67	6.11	4.66	-0.01	-1.45
AS-1	Employee who instill confidence in users	4.41	6.02	4.44	0.03	-1.58
AS-2	Giving users individual attention	4.74	6.05	4.42	**-0.32**	-1.63
AS-3	Employees who are consistently courteous	4.58	6.06	4.61	0.03	-1.45
AS-4	Readiness to respond to users' questions	4.72	5.98	4.62	**-0.10**	-1.36
AS-5	Employees who have the knowledge to answer users questions	4.49	6.02	4.58	0.09	-1.44
AS-6	Employees who deal with users in a caring fashion	4.90	6.15	4.73	**-0.17**	-1.42
AS-7	Employees who understand the needs of their users	4.52	6.13	4.78	0.26	-1.35
AS-8	Willingness to, help users	4.71	6.31	4.83	0.12	-1.48
AS-9	Dependability in handling users' service problems	5.03	6.27	4.92	**-0.11**	-1.35
IC	Information Control *	4.63	6.05	4.71	0.08	-1.34
IC-1	Making electronic resources accessible from my home or office	4.08	5.67	4.09	0.01	-1.58
IC-2	A Library Website enabling me to locate information on my own	4.49	6.14	4.49	0.00	-1.65
IC-3	The printed library materials I need for my work	4.65	6.13	4.89	0.24	-1.24
IC-4	The electronic information resources I need	4.78	6.16	4.89	0.11	-1.27

IC-5	Modern equipment that lets me easily access needed information	4.76	6.05	4.80	0.04	-1.25
IC-6	Easy-to-use access tools that allow me to find things on my own	4.68	6.06	4.79	0.11	-1.27
IC-7	Making information easily accessible for independent use	4.81	6.10	4.97	0.16	-1.13
IC-8	Print and electronic journal collection I require for my work	4.86	6.09	4.81	**-0.05**	-1.28
LP	Library as Place*	4.69	6.06	5.03	0.34	-1.03
LP-1	Library space that inspires study and learning	4.36	5.89	5.04	0.68	-0.85
LP-2	Quiet space for individual activities	4.81	6.04	5.10	0.29	-0.94
LP-3	A comfortable and inviting location	4.66	6.00	5.01	0.35	-0.99
LP-4	A gateway for study, learning or research	4.81	6.24	5.10	0.29	-1.14
LP-5	Community space for group learning and group study	4.80	6.16	4.90	0.10	-1.26
	Over all**	4.66	6.07	4.80	0.13	-1.27

(n= 83) * Dimension Average ** Overall Average Source: Survey data

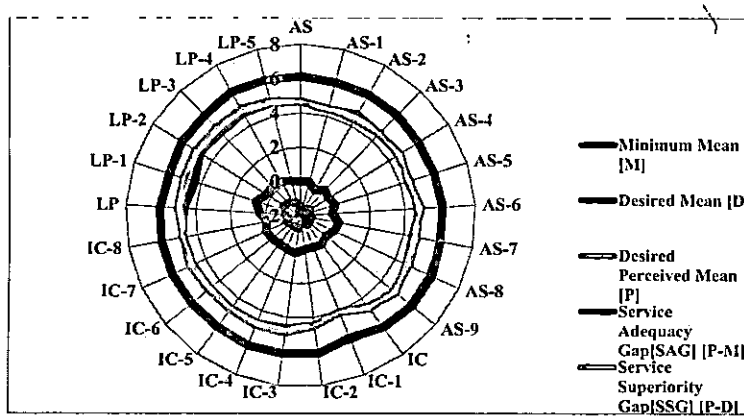


Fig-2 LibQUAL Survey Results – Item Analysis

It is observed from the Table-2 library respondents overall desired expectation of service mean score is 6.07. 'Affect of Service' dimension has the highest mean score (6.11), followed by 'Library as Place' (6.06) and 'Information Control' dimension has the least mean score (6.05).Minimum mean score for minimum expectations of service is 4.66. LP dimension has highest mean score (4.69), followed by AS (4.67) and IC dimension has the least mean score (4.63).Respondents' perceived service is rated with a mean score of 4.80. The highest mean score of perceived service is LP dimension (5.03), followed by IC (4.71) and AS dimension has the least mean score (4.66). The above results indicate that the library had failed to meet the minimum expectation of service.

12. Service Adequacy Gap (SAG)

It was found that 'Affect of Service' dimension four items floated below the Zone of Tolerance (ZOT) namely: Giving users individual attention (-0.32), employees who deal with users in a caring fashion (-0.17), dependability in handling users' service problems (-0.11), and readiness to respond to users' questions (-0.10). Highest SAG scores are observed in the employees who understand the needs of their users (0.26) and willingness to help users (0.12).

In the 'Information Control' dimension, the highest SAG scores are observed in the printed library materials I need for my work (0.24) and making information easily accessible for independent use (0.16). Very small SAG scores are a Library website enabling me to locate information on my own (0.00) and Making electronic resources accessible from my home or office (0.01).

'Library as Place' dimension's wide SAG scores are observed in the area of service library space that inspires study and learning (0.68) and a comfortable and inviting location (0.35) are statistically significant. Least adequacy gap scores are quiet space for individual activities (0.29) and community space for group learning and group study (0.10).

Library's overall SAG score is 0.13(Table -2). LP dimension has the wide adequacy gap score (0.34), followed by IC gap score (0.08), and AS dimension very small SAG score (-0.01).

13. Service Superiority Gap (SSG)

Results of the study (Table -2) shows that, in the 'Affect of Service' dimension lowest SSG scores are observed in the area of service dependability in handling users' service problems, employees who understand the needs of their users

(-1.35) and readiness to respond to users' questions (1.36). In the highest SSG scores are observed for the attribute of giving users individual attention (-1.63) and employee who instill confidence in users (-1.58).

It is observed in the 'Information Control' dimension, the lowest SSG scores are making information easily accessible for independent use (-1.13) and the printed library materials I need for my work (-1.24).The wide gaps are observed for the attribute of a library website enabling me to locate information on my own (-1.65) and making electronic resources accessible from my home or office (-1.58).

The lowest SSG scores in the 'Library as Place' dimension are observed for the attributes of library space that inspires study and learning (-0.85) and quiet space for individual activities (-0.94). The highest SSG scores are community space for group learning and group study (-1.26) and a gateway for study, learning or research (-1.14). Library's overall SSG score is (-1.27) (Table -2). LP has the lowest service superiority gap score (-1.03), followed by IC gap score (-1.34), and AS dimension has the highest SSG score (-1.45).

14. Suggestions

The following strategies have been suggested to fulfill the library service quality gaps and satisfying the expectations of library users.

- Users of this library were of the view that library staff should help and give users individual attention, create interest among the users and invite them with a caring fashion, understand the needs of the users, willing to help and dependability in handling users' service problem.
- As far as 'Information Control' dimension, it suggests that the library should make an effort to improve access to e-journals, help in identifying links for e-journals, increase number of titles of books and journals. The library should announce services and resources via the library homepage. The structure of the homepage should be clear and easy to use. The library should provide more facilities such as computer terminal, WI-Fi internet service, etc. to enhance remote access service.
- With regard to 'Library as Place' it suggested that the library should plan to make better use of its space and create a more inviting, comfortable ambience for users. It should provide a separate place for individual activity and community space for group learning and group study in the library

15. Conclusion

The results of the study revealed that the level of service quality only across minimum level and do not achieve the customers desired. This study helps to the Vijayanagar Institute of Medical Sciences library for knowing the library user satisfaction level and to improve the service quality to meet the library user's expectations for sustainable competitive advantage. The present study proved LibQUAL instrument is necessary and complementary tool in library arsenal that enables to measure service effectiveness and determine where improvements must be made.

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PUBLIC PERCEPTION TOWARDS DEMONETIZATION: A CASE STUDY OF INFORMATION LITERACY IN VIJAYAPURA DISTRICT

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Abstract: In the present study a collective attempt has been made to know the information literacy and level of literacy skills among the public with reference to Vijayapura district, Karnataka state. Represent developments of demonetization of Indian currencies. In this study survey method for research has been adopted such as Questionnaire method was used to collect necessary data Vijayapur city has been selected for this study and 75 persons were interviewed and collected the information. The result shows that all the respondents under study are account holder in the bank and they know the banking system. Further majority of study population prefer for cashless transactions and interested in digital banking system. They are little bit worried about frequent change of RBI Policy. Newspapers, TV, and radio are most preferred sources for consulting information on demonetization. Further, majority of the respondents opined that demonetisation is tool for eradication of black money and corruption. RTGS, mobile banking ATM service are highly financial need information. Majority of the study population were access the demonetisation information by family members, friends and banks. News papers, TV and Radio are the most consulting sources by the respondents. Finally it is suggested that there is need to create awareness and wide publicity is required about sources of information other than the TV and Newspaper.

Keywords: Information literacy, Demonetization, digital transaction, cashless

1. INTRODUCTION

The rupee has a mysterious in any given history. Early period money transaction was in exchange of goods to goods and goods for services, rather than for money. Directly exchanged without using a medium of exchange, It was known Barter system. Later period coin as money media, Especially In 6000 B.C Mesopotamia tribes and Babylonian's developed coins, generally we believed since then currency

system started in society.

In India money in the form of coins was said to be introduced long back and this credit goes to Ancient Indians as they were the earliest issuer of coins in the world along with the Chinese. Coin Punch marked called "puranas" in 6th century B.C metal Coins were most universal embodiment of money.

Currency system in India till 18 century was in the form of gold and silver coins only. Invention of paper and the printing machine in China impacted on European Trading Companies to establish their own in their region, Bank of Hindustan in Calicut, begun issuing very first version of Indian paper currency, under the Paper currency ACT of 1861 before independence. Reserve Bank of India is the Central bank of our country. It came in to existence in 1935 1st April under Reserve Bank of India Act, 1934.The issue of currency notes is main function of Bank and first note was issued in the year 1938.

The form of money is changing from its inception. Centuries ago in the market commodities or goods or services were exchanged for goods to goods, it was known as barter system. Then skin of animals was used as currency to overcome barter system as it became impossible to find the right person who was ready to exchange his goods with mine. Gradually, We came across the development of currency in the forms of money to paper currency. The value of each currency was fixed as per necessary legal tender. Types of money we found earlier are in the form of coins made by metals like skin, Copper, Zink, Silver and Gold. During mobile period leather currency was introduced but gradually failed its value.

In China after the invention of printing machine the paper currency came into existence. Slowly all over the world shifted their currency in to paper currency.

In India the bankers bank RBI after Independence it being the soul authority to print the paper currency in various denominations.

The impact of ICT Digital banking came into practice within three decades. That time again the shift has taken place for paper currency then changed to smart card transaction which was practiced less in the money transaction.

History of Demonetization

When we go through history demonetization has been implemented in India before independence.

With various money related problems in demonetization has been taken place, Rs 1000/- and Rs 10000/- demonetization were first demonetized in Jan1946 in India during East Indian company rule to control corruption again

in the year 1954 on currency note of RS 5000/- and all the three notes were demonetized in January 1978 during Janatha government led by Murarji Desai. More recently, 2014, the RBI has demonetized all banknotes printed before 2005. with the intention of justifying national development.

An important role plays of currency in money transaction as statutory. Dr B.R. Ambedkar said in his book ***"History of Indian currency and banking"*** regarding the Indian currency he was mentioned the weak point of the currency notes in 1947 "we need to plan for effectively currency notes it's hold and circulate in the form of monetary system. In order to curb the evil demonetization is required every ten year" in a developing country like India.

2. INFORMATION LITERACY:

Information is a difficult word to define states Blackie's dictionary mentioned something shown or represented by a specific arrangement or sequence of things. News or facts learned about something or someone informant similarly in Webster dictionary mentioned Information as news, data, fact, intelligence or knowledge. Information Literacy is the process of knowing when and why information is required, where to find it, and how to evaluate, use and communicate it in an ethical way. It is the combination of all the skills (competencies) that are required for the effective and maximum use of information. It is common to all disciplines, illiterate and literate to know all leaning environments, and in all levels of life, it forms the basis of lifelong learning. But Demonetization information as an immediate need of common Indian, because Rs 500/- and Rs 1000/- notes have become part of daily lives as common need. It was observed; unexpectedly its demonetization was felt essential to overcome on economic imbalance of our economy.

3. REVIEW OF THE LITERATURE:

Literature review has been identified init'sresearch literature, which results unique dimensions. Demonetization Information about information literacy viewed in articles to know an important attempt has been made. Published sources referred in Government publications, Newspapers, journals and electronic Medias as sources and unpublished sources like Human sources. According Dennis Rajakumar and Shetty (2016) Demonetization 1978, importance of information further article emphasizes In the context of the demonetization of Rs 500 and Rs 1000 8 November 2016 announcement significance of extreme step taken by the government and RBI. Need and approaches to policy is observed.

Ashok (2016) depicts the sudden demonetization of Rs 500 and Rs. 1000 notes, elimination, economic impact, Loss of Business and GDP, informational Credit Disruption journey of the chariot of demonetization. Banarjee (sumanth)2016 reports long term impact of farmer's cash needs and several questions about how to transfer legally currency introspects over the system. Media literacy 8th November 2016, news debates and workshops and trailing organized by NGO's observed and reviewed the demonetization centre of attention which in fact was not understood by the common man, the paradox was possible persecutions of impact serious created havoc among citizens of all class.

4. NEED OF THE STUDY:

Recent developments in India highlights that there is necessary to become an information literate because the government of India is initiating online process of all the policies and procedures including e-commerce, e-learning, Aadhar cards, ration card, voters Id and e-governess etc. Further, the government has also signifying use of online mode for making payments of regular transactions e.g. money transfer, mobile recharges, electricity bill payment, train tickets etc. to reduce the use of printed currencies. Recent Demonetization has impacted lot on each and every citizen of the country especially financial aspects of common man. It is very much essential to study the public perception towards demonetisation. The study was undertaken to explore the information literacy and skills towards demonetisation especially to find the ability to identifies, locate, evaluate and effectively use of financial information.

Income tax department of India reports 2014-15 over 120 cores of population, only 12lakh were declared their income above 10 lakhs. It leads to black money and corruptions. Set back to national development. To control over illegal money transaction demonetization implemented.

The study was identified the importance of demonetization and its impacts led to study.

5. OBJECTIVES:

In this study the following primary objective is to determine the Information Literacy Level of demonetization Information support to get currency exchange and legal tender Information.

- To find the background profile of the respondents under the study,
- To know the Demonetization system impact among the public
- To find out the information needs, sources, access, use and Satisfaction of information towards demonetization among the public.
- To find out the extent use of information needed by the public.
- To study the difficulties faced in accessing and consult in use of Demonetization.
- To examine the information literacy among the public towards demonetization.

6. RESEARCH METHODOLOGY:

For the present study, the Explorative Method of research was adopted to know the level of Information Literacy about demonetization and information need, awareness, source and Extent of use of Demonetization information. The Structured Questionnaire has been designed on the topic based on the objectives of the study. Basically personal profiles and literacy norms was used as a data collection tool and collected primary data from the questionnaire has been analysed and tabulated in following sections with the help of SPSS and Excel software.

ANALYSIS AND INTERPRETATION:

Table – 1 General Characteristics of Respondents under study

Age wise distribution		**Religion wise distribution**	
Age	**Frequency**	**Religion**	**Frequency**
20 to 30	21(28.0%)	Hindu	41(54.7%)
31 to 40	24(32.0%)	Muslim	16(21.3%)
41 to 50	10(13.3%)	Christian	8(10.6%)
50 Above	20(26.7%)	Jain	10(13.3%)
Total	75(100%)	Total	75(100%)
Gender wise distribution		**Domicile Wise distribution**	
Gender	**Frequency**	**Domicile**	**Frequency**
Female	44(58.7%)	Rural	30(40.0%)
Male	31(41.3%)	Urban	45(60.0%)
Total	75(100%)	Total	75(100%)

Category of the respondent		Income of the respondent	
Category	**Frequency**	**Income**	**Frequency**
GM	41(54.7%)	10000 to 50000	22(29.3%)
OBC	23(30.7%)	50000 to 100000	18(24.0%)
SC/ST	8(10.7%)	200000 to 300000	7(9.3%)
Minority	3(4.0%)	above 400000	28(37.3%)
Total	75(100%)	Total	75(100%)
Education of the respondent		**Occupation of the respondent**	
Education	**Frequency**	**Occupation**	**Frequency**
Illiterate	4(5.3%)	Govt. Employee	7(9.3%)
Elementary Education	7(9.3%)	Semi Government	2(2.7%)
SSLC	10(13.3%)	Private	48(64.0%)
PUC/Diploma	8(10.7%)	Self Employment	2(2.7%)
Graduation &Above	46(61.3%)	Students	16(21.3%)
Total	**75(100%)**	**Total**	**75(100%)**

It is found from table-1 that 32% (N=24) of the respondents are between 31 to 40 years of age group, followedby 28.0% (N=21) of the respondents in the age group 20 to 30. While, 26.7% (N=20) of the respondents have 50 years of age and above. However, 13.3% (N=10) of the respondents are between 41 to 50 years of age group. Finally, it can be concluded that majority of the respondents from 31 to 40 years of age group.

It is found from table that more than 58.7% (N=44)of the respondents are Female and remaining 41.3% (N=31) are Male. Further, study population has been divided into different social classes like, GM, OBC, SC/ST and Minority. It is observed from table- that the study population comprises of 54.7% (N=41) of GM, 30.7%, (N=23) of OBC, 10.7% (N=8) of SC/ST and 4.0% (N=3) of minority respectively. It can be analyzed with above analysis that majority of the study population either belongs to GM or OBC.

It is observed that higherpercent (61.3%, N=46)of the study population have Graduation and above Graduation, followed by those have SSLC (13.33%, N=10), and 10.7% (N=8) of the study population have been reported as PUC, Elementary education level respondents in fourth majority among the respondent (9.3%, N=7). While, (5.3%, N=4) very small portion of the study population are Illiterate. Further, the study population comprises of 54.7%, (N=41) of Hindu, 21.3%, (N=16)

of Muslim, 13.33% (N=10) of Jain and only 10.6% (N=8) of Christian. Majority of the respondents 60.0% (N=45) belongs to Urban and remaining 40.0% (N=30) respondents belongs to Rural.Largemajority of the study population (37.3%, N=28) have more than Rs.4,00,000 income. Significant number of (29.3%, N=22) of respondents having income in between Rs.10,000 to 50,000. Another 24.0% (N=18) of the respondents have income in between. Rs.50,000 to 1,00,000. Hardly, 9.3% (N=7) of respondents have income of Rs. 2,00,000 and above Rs. 3,00,000. Private employees (64.0%, N=48) constitute a large proportion of study population. More than 21.3%, (N=16) of respondents are Students. Very small percentage (9.3%, N=7) of respondents are Government employees. However, hardly 2.7%, (N=2) respondents are Semi government and Self-employed each.. It can be analyzed that majority of the study population are high educated and they working in private sectors.

Table- 2 Language Known by the respondents

Sl. No	Language	Frequency	Percent
1	Kannada	75	100.0
2	Hindi	50	66.7
3	English	48	64.0
4	Marathi	14	18.7
5	Telugu	7	9.3
6	Urdu	4	5.3

Local and Regional language of Karnataka is Kannada which is mother tongue, for the large majority of respondents (100%, N=75) followed by half of the respondents speaks Hindi (66.7%, N=50), English (64.0%, N= 48) and small number of respondents speaks Marathi (18.7%, N=14) and Telugu (9.3%, N=17) and still less number of respondents known Urdu language (5.3%, N=4). Finally it can be concluded that mother tongue (Kannada) known by all the respondents.

Table-3 Family have following Facilities

SI. NO	Govt. Facilities	Frequency	Percent
1	APL Card	23	30.7
2	BPL Card	8	10.7
3	Antodaya Card	15	20.0
4	Adhar Card	65	86.7

The respondents under the study were asked to know the facilities availed by the respondents from Government. It is observed that large majority of the study population (86.7%, N=65) have possesses Adhar cards. While, 30.7%, (N=23) of the respondents have APL cards and 20.0% (N=15) have Antodaya card. However, 10.7% (N=8) of the respondents have BPL cards. It can be concluded that majority of the study population haveAdhar card.

Table-4 Information about Bank and Banking Systems

Awareness about bank and banking system		**Account holder**	
Awareness about bank	**Frequency**	**Account holder**	**Frequency**
Yes	75(100%)	Yes	75(100%)
No	00	No	00
Total	75(100%)	Total	75(100%)
Awareness about RBI Demonetization Policy		**Do you Prefer Cashless Society**	
Demonetization	**Frequency**	**Cashless Society**	**Frequency**
Yes	73(97.3%)	Yes	65(86.66%)
No	2(2.7%)	No	10(13.33%)
Total	75(100%)	Total	75(100%)
Cyber security satisfied Digital banking		**Cyber tech and cyber law is required**	
Cyber security	**Frequency**	**Cyber security**	**Frequency**
Yes	60(80.0%)	Yes	69(92.0%)
No	15(20.0%)	No	6(8.0%)
Total	**75(100%)**	**Total**	**75(100%)**

Table indicates the information about Bank and Banking system of the respondents. It is found from the table indicate that all the respondents (100% (N=75)) under the study have aware about Bank and Banking and all the respondents have Bank accounts. Majority of the respondents(97.3% ,N=73) are aware of RBI Demonetization Policy and very least 2.7% (N=2) respondents are not aware. Further, it is found from table that 86.66% (N=65) of the respondents preferred cashless society and 13.33% (N=10) of the respondents were not preferred cashless society. Further, 80.0% of the respondents were satisfied. However, 92.0% (N=69) of the respondents opined Cyber technology and Cyber laws are very much essential for digital banking.

Table- 5 Type of account

SI.NO	Account holder	Frequency	Percent
1	Saving Account	58	77.3
2	Current Account	20	26.7
3	Joint Account	6	8.0
4	Jandan Account	3	4.0

Table – reveals the type of accounts of the respondents. It is found that majority of the respondents 77.3% (N=58) have Savings account followed by 26.7% (N=20) Current account and least number of respondents 8.0% (N=6) Joint account and 4.0% (N=3) have Jandan account. It can be concluded majority of the respondents have saving account.

Table-6 Concept of demonetization -

SI.NO	Demonetization	Frequency	Percent
1	Corruption	30	40.0
2	Striping currency unit of its status as legal tender	34	45.3
3	It is process of change of national currency	31	41.3
4	Old currency replaced with new	30	40.0
5	Eradication of Black money	28	37.3
6	Compact with terrorism	14	18.7

A question was asked to respondents to know about the concept of Demonetization from Table-. It is observed that Majority of the respondents 45.3% (N=34) said demonetization is Striping currency unit of its status as legal tender, following by 41.3% (N=31) It is process of change of national currency, another 40.0% (N=30) of the respondents opined that old currency replaced with new and Corruption. However, 37.3% (N=28) opined it is Eradication of Black money and 18.7% (N=14) said it is Compact with terrorism. It can be concluded that majority of the respondents opined that concept of demonetization is Striping currency unit of its status as legal tender.

Table- 7 Extent of various type of finance information needed by the respondents

SI. NO	Type of finance information	Very Great Extent	Great Extent	Some Extent	Undecided	Not at all	Total	Mean
1	RBI Finance policy	15(20.0%)	36(48%)	15(20.0%)	3(4%)	6(8%)	276	3.68
2	Tax procedure	18 (24%)	5(6.66%)	38 (50.66%)	10 (13.33%)	4(5.33%)	248	3.31
3	Cashless Transaction	10 (13.33%)	37 (49.33%)	11 (14.66%)	11 (14.66%)	6(8%)	259	3.45
4	Digital Banking	4 (5.33%)	47 (62.66%)	14 (18.66%)	8 (10.66%)	2(2.66%)	268	3.57
5	Net Banking	4(5.33%)	43(57.33%)	12(16%)	8(10.66%)	8(10.66%)	252	3.36
6	Card Swipe	22	39(52%)	9(12.0%)	3(4%)	2(2.66%)	301	4.01
7	Income tax returns	4(5.33%)	52 (69.33%)	0	2(2.66%)	17 (22.66%)	249	3.32
8	ATM Service	40(53.33%)	23 (30.66%)	4(5.33%)	0	8(10.66%)	312	4.16
9	Mobile Banking	42(56.0%)	23 (30.66%)	4(5.33%)	0	6(8.0%)	320	4.27
10	Procurement of Properties	14(18.66%)	12(16%)	19(25.33%)	15(20%)	15(20%)	220	2.93
11	NEFT	2(2.66%)	22(29.33%)	4(5.33%)	31(41.33%)	16(21.33%)	188	2.51
12	RTGC	37(49.33%)	27(36.0%)	28(37.33%)	10(13.33%)	0	397	5.29
13	Others	16(21.33%)	7(9.33%)	27(36.0%)	2(2.66%)	23(30.66%)	216	2.88

It is found from above table that Extent of various type of finance information needed by the respondents under the study. The question was asked in the five point scale in the range of very great extent needed information to not at all. The mean scores have been calculated based on the scale values multiplied with corresponding frequency and summed up the all product then divided by sample size (n=75). It is observed from table- that respondents are need the finance Information RTGC(X=5.29), Mobile Banking (X=4.27), ATM service (X=4.16), Card Swipe (X=4.01) are the highly needed financial information. While, RBI Finance Policy (X=3.68), Digital Banking (X=3.57), Cashless transaction (X=3.45), Net Banking (X=3.36) are medium preferred needed financial information from the respondents. However, NEFT(X=3.32), Tax procedure (X=3.31), Procurement of properties (X=2.93), Income tax returns (X=2.51) are least preferred needed financial information by the respondents under the study. It can be concluded that NEFT, Mobile banking are highly needed information and RTGF, Establishment of firm are least needed financial information by the respondents under the study.

Table- 8 Access of Demonetization Information

Sl.No	Seeking of Information	Frequency	%
1	Family Members	69	92.0
2	Friends	65	86.66
3	Local financial bodies	34	45.33
4	Neighbour	21	28.0
5	Internet	30	40.0
6	Charted Accountant	29	38.66
7	Bank Manager	32	42.66
8	Income Tax Department	9	12.0
9	Share market	6	8.0
10	Agents	10	13.33

Table depicts the access of demonetization information. Most of the respondents 92.0% (N=69) access information from Family members. Followed by 86.66% (N=65) from Friends and 45.33% (N=34) from Local financial bodies. Further,42.66% (N=32) from Bank manager, 40.0% (N=30) from Internet, 38.66% (N=29) from Charted Accountant. However, 28.0% (N=21) from Neighbor, 13.33% (N=10) from Agents, 12.0% (N=9) Income tax departments and 8.0% (N=6) from Share market. It can be concluded that majority of the respondents access the demonetization information from family member, friends, local financial bodies and by Internet.

Table-9 Extent of use of various type of sources do you use

Sl.No	Sources	5	4	3	2	1	Total	Mean
1	Govt. Publications	6 (8.0%)	5 (6.66%)	27 (36.0%)	9 (12.0%)	28 (37.33%)	177	2.36
2	Reserve Bank of India	9(12.0%)	8(10.66%)	6(8.0%)	5(6.66%)	47 (62.66%)	152	2.03
3	Nationalized Banks	10 (13.33%)	18 (24.0%)	22 (29.33%)	0	25 (33.33%)	213	2.84
4	Income Tax Department	0	8 (10.66%)	21(28.0%)	13 (17.33%)	33 (44.0%)	154	2.05
5	Bank Manger	19 (25.33%)	7(9.33%)	22 (29.33%)	3(4.0%)	24(32.0%)	219	2.92
6	Auditors	3(4.0%)	5(6.66%)	24 (32.0%)	8 (10.66%)	35 (46.66%)	158	2.11
7	State level bank committee	10 (13.33%)	0	30(40.0%)	6(8.0%)	29 (38.66%)	181	2.41
8	RBI Finance Policy Committee	15 (20.0%)	5 (6.66%)	0	9 (12.0%)	46 (61.33%)	159	2.12
9	Internet/Web	37 (49.33%)	6(8.0%)	3(4.0%)	27(36.0%)	2(2.66%)	274	3.65
10	Medias (TV, Radio)	65 (86.66%)	3(4.0%)	0	3(4.0%)	4(5.33%)	347	4.63
11	Social Networks	61 (81.33%)	5(6.66%)	2(2.66%)	3(4.0%)	4(5.33%)	341	4.55
12	Non book materials	19 (25.33%)	8(10.66%)	2(2.66%)	2(2.66%)	44 (58.66%)	181	2.41

Table-10 Type of Sources consulted by the respondents

Sl.No	Kind of sources	Highly Satisfied	Satisfied	Moderately	Less Satisfied	Not at all	Total	Mean
1	Newspapers	63(84.0%)	6(8.0%)	6(8.0%)	0	0	357	4.76
2	Government Publications	24(32.0%)	2(2.66%)	16(21.33%)	9(12.0%)	24(32.0%)	218	2.91
3	E-books	7(9.33%)	25(33.33%)	4(5.33%)	2(2.66%)	37(49.33%)	188	2.51
4	E-Journals	5(6.66%)	25(33.33%)	4(5.33%)	2(2.66%)	39(52.0%)	180	2.40
5	Online Virtual resources	8(10.66%)	28(37.33%)	4(5.33%)	2(2.66%)	33(44.0%)	201	2.68
6	Radio	15(20.0%)	26(34.66%)	8(10.66%)	2(2.66%)	24(32.0%)	231	3.08
7	Television	45(60.0%)	26(34.66%)	2(2.66%)	0	2(2.66%)	337	4.49
8	Social Networks	58(77.33%)	6(8.0%)	2(2.66%)	5(6.66%)	4(5.33%)	334	4.45
9	Institutional Source	28(37.33%)	5(6.66%)	8(10.66%)	5(6.66%)	29(38.66%)	223	2.97
10	Individual Sources	29(38.66%)	4(5.33%)	6(8.0%)	10(13.33%)	26(34.66%)	225	3.00

Table- reveals that extent use of information sources from the respondents under the study. The question was asked in the five point scale in the range of very highly satisfied information to not at all. As many as 12 required sources of information have been listed out as shown the table -. The mean scores have been calculated based on scale values multiplied with corresponding frequency and summed up all product then divided by sample size (N=75). It is observed from table- Medias like Newspaper, TV, Radio (X=4.63) are highly used information sources, following by Social Networks (X=4.55), Internet/Web (X=3.65), Bank Manager (X=2.92), are extensively used information from the respondents under the study. Further indicates State level banking and Non book Material (X=2.41), Govt. Publications (X=2.36) and RBI Finance policy(X=2.12) are medium needed information from the respondents. However, Auditor (X=2.11) Income tax department (X=2.05), Reserve bank of India (X=2.03) are least used information by the respondents under the study. Finally, it can be concluded that medias are highly used information and RBI policy are least used information sources.

One of the main objectives of the study was to identify the type of information sources required by the respondents under the study. The question was asked in the five point scale in the range of very highly satisfied information to not at all. As many as 10 required sources of information have been listed out as shown the table -. The mean scores have been calculated base on scale values multiplied with corresponding frequency and summed up the all product then divided by sample size (N=75). It is observed from table- that Newspaper is highly satisfied sources of information (X=4.76), Television (X=4.49), Social Networking (N=4.45) are emerged as highly preferred sources of information among the respondents. While, Radio (X=3.08), Individual sources (X=3.60), Institutional sources (X=2.97) are medium satisfied sources of information among the respondents. However, Government publication (X=2.91), Online virtual resources(X=2.68), E-books(X=2.51) and E-Journal(X=2.40) are the least satisfied sources of information by the respondents under study. It can be concluded that Newspapers are the highly satisfied sources and E-book and E-journal are least satisfied sources of information.

Table- 11 Evaluate information

SI. NO	Consult	Frequency	Percent
1	Authenticity	64	85.3
2	Accessibility	2	2.7
3	Coverage	31	41.3

4	Usability	15	20.0
5	Reliability	47	62.7

Table reveals the evaluation of information obtained by the respondents under the study. It is found that majority of the respondents the obtained information is (85.3%, N=64) Authentic one. Another 62.7% (N=47) opined that it has reliable one. However, 41.3% of the respondents expressed the they have got complete information what they required

Table-12 Require Information

SI. NO	Consult	Frequency	Percent
1	Use of Information as it is	41	54.7
2	Organize the information in a required format	20	26.7
3	Evaluate & Select the most relevant one	42	56.0
4	Others	4	5.3

Respondents were asked about the use of information after getting from the reliable source. The respondents were given the response as soon in the table-. Majority of the respondents (56.0%, N=42)Evaluate & Select the relevant information from the obtained information. While,54.7%(N=41) use the obtained information as it is without making any changes. However, 26.7% (N=20) of the respondents organize the obtained information in their required format.

Table-13 Demonetization Contributes national Development-

SI. NO	Contribution	Frequency	Percentage
1	Eradication of Black Money	57	76.0
2	Bureaucracy	16	21.3
3	Terrorism	57	76.0
4	Naxalite	12	16.0
5	Illegal financial activities	59	78.7

A question was asked to respondents Demonetization contributes towards national Development. Majority of the respondents 78.7% (N=59) said that it helps to Control Illegal financial activities in the country, followed by 76.0% (N=57) Eradication of Black money and Terrorism. However, it helps to control the 21.3% (N=16) Bureaucracy and 16.0% (N=12) Naxalite.

Table-14 Difficulties faced by the respondent towards Demonetization

SI. NO	Difficulties	Frequency	Percent-age
1	Lack of Knowledge about Information Source	21	28.0
2	Unfamiliarity with search methods	11	14.7
3	Unorganized elements/contents in a search page	5	6.7
4	Lack of time	34	45.3
5	Lack of literacy skills	12	16.0
6	Non Co-operative of consult staff/Employee	30	40.0
7	Frequent change of RBI policy	61	81.3

Table – shows the difficulties faced by the respondents under the study. It if found that majority of the respondents (81.3%, N=61) facing the problem with respect toFrequent change of RBI policy, 45.3% (N=34) expressed that due to the lack of time. While, 40.0% (N=30) of the respondents opined that Non Co-operative of consult staff/Employees and 28.0% (N=21) respondents facing difficulties in lack of knowledge about information sources. However, 16.0% (N=12) of the respondents reveals lack of literacy skills, 14.7% (N=11) of the respondents were Unfamiliarity with search methods and 6.7% (N=5) Unorganized elements/ contents in a search page. Finally it can be concluded that major problem with respect to demonetization are Frequent change of RBI policy and shortage of time to exchange currency.

7. FINDINGS:

- Less awareness about income tax among the respondents
- Literate people are more aware about cash less system than illiterates
- All the respondents (100% (N=75)) under the study have aware about Bank and Banking and all the respondents have Bank accounts.
- Respondents strongly agreed Demonetization impact helps in national development.
- Majority of the study population (86.7%, N=65) have possesses Adhar

cards.

- Majority of the respondents 77.3% (N=58) have Savings account.
- Majority of the respondents 45.3% (N=34) said demonetization is Striping currency unit of its status as legal tender
- Majority of the respondents (81.3%, N=61) facing the problem with respect to Frequent change of RBI policy.
- The majority of the respondents are need the finance Information RTG-C(X=5.29), Mobile Banking (X=4.27), ATM service (X=4.16), Card Swipe (X=4.01) are the highly needed financial information.
- Newspaper is highly satisfied sources of information (X=4.76), Television (X=4.49), Social Networking (N=4.45) are emerged as highly preferred sources of information among the respondents.
- Majority of the respondents the obtained information is (85.3%, N=64) Authentic one.

8. CONCLUSION:

With the advent of technology, digital literacy has been conveyed that restructured cash transaction to cash less transaction in many forms in money market. The result shows that all the respondents under study are account holder and they know the banking system. Further majority of study population prefer for cashless transactions and interested in digital banking system. They are little bit worried about frequent change of RBI Policy. Newspapers, TV, and radio are most preferred sources for consulting information on demonetization. Further, majority of the respondents opined that demonetisation is tool for eradication of black money and corruption. RTGS, mobile banking ATM service are highly financial needed information. Majority of the study population were access demonetisation information by family members, friends and banks. Finally it is suggested that there is need to create awareness and wide publicity is required about sources of information other than the TV and Newspaper. Accurate, authentic and reliable source of information and literacy skills required to the high standard of living.

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Role Of Academic Libraries In Indain Higher Education System: An Overview

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Abstract: India has significant advantages in the 21st century knowledge race. It has a large higher education sector – the third largest in the world in student numbers, after China and the United States. The purpose of education is well-rounded development. Students need a combination of arts, computer science, science, and humanities or literature courses to achieve this kind of development. A well-equipped and well-managed library is the foundation of modern educational structure. It is said that education without library services is like a body without soul, a vehicle without an engine, and building with bricks but no cement. The library is the chief instrument for accumulating and using our intellectual heritage. Formal education can be conducted effectively and efficiently only with well-equipped libraries. Today, libraries are connected to a vast ocean of Internet-based services. Academic libraries are the nerve centres of their institutions, and must support teaching, research, and other academic programmes. These are critical contributors to knowledge generation which serve a wide spectrum of knowledge seekers. Libraries do this by providing access to knowledge which is essential for the development of the society. The mission of an academic library is focused principally on users and is driven by their needs. This study highlights the role of Academic Libraries in Higher Education and recent developments in academic libraries.

Keywords: *Higher Education, Academic Library, Role of academic libraries in higher education, Latest developments in academic library system.*

1. INTRODUCTION:

Education is an ongoing and unending process, and it can be sustained only by

cultivating reading habit among people belonging to all sections and strata of our society. According to Mahatma Gandhi "Books play the role of soap for mind." Education is a process of leading one out of ignorance, and which exposes the individual to the light of knowledge. Learning is a lifelong process. In the formal educational system, i.e., at the school level, colleges and university level, the books plays a significant role in communicating the knowledge. Education plays a crucial role in economic and social development and step towards modernization.

- The objective of education is to make a person an intelligent fellow. Education leads human intelligence towards truth. Emotions to humanity and human body to work-hand teachers have to play a decisive role in this respect.
- A person can gain knowledge mainly by three methods viz-
- Through formal education which he/she gets in his/her school and college life.
- Through his/her experience.
- Through reading.

A library is the central responsibility for functioning of a university and a college. Academic libraries have a pivotal role in providing equal access to information. This aspect has been emphasised in Radhakrishnan Commission Report as well as in Kothari Commission Report. UGC (India) attaches great importance to the strengthening of library facilities in universities and colleges, and to their efficient administration. If the purpose of education is learning, then the library is an indispensable source of learning and there is no replacement of it. The objectives of an Indian university during pre-Independence period had been to archive knowledge. In post - Independence India, the libraries have aimed at dissemination of information for lifelong learning and incessant search for new knowledge. Well-established libraries with all round and up-to-date collections suitable for learning and research are necessary for higher education system, as they have proved to be significant partners in the development of scholarship throughout the world.

2. HIGHER EDUCATION SYSTEM:

All types of Universities impart higher education to the students and award them academic degrees. They impart higher education to the students at the undergraduate and post-graduate level. They also provide vocational education

and training them. Tertiary education is also provided by colleges and universities. The activities of universities regarding higher education are mainly concerned with teaching, research and social extension programmes. It is now observed that a large number of populations are taking higher education in many of the developed countries. Higher education has been given quite significant place in deciding the economic policy of the country. The process of higher education and related training are generally exercised by the universities. It is mainly theoretical education. On the contrary vocational education is mainly based on both theory and practice. The university which is imparting higher education and is conducting research programmes awards the students several kinds of degrees at the graduate and post-graduate level and doctorate degree in all the branches of education.

Higher education also includes professional education besides traditional education, which gives post graduate education. Besides many purposes of higher education, one of them is to acquire concrete skills essential for the existence of the man in the world. It enables a person to think logically about the critical issues and put the facts in detail. It also makes the person to understand the implications of the activities in terms of morality and transfers his knowledge to others.

Indian higher education system is as large as the systems of the world. Before independence of India, the educational institutions were very few but at present there are number of universities including central universities, state universities, deemed universities and research institutions. There are thousands of colleges imparting education in all branches of knowledge. Similarly there are many lacks of teachers and millions students taking higher education. As per the Act of parliament, it established the University Grants Commission in 1956. Being an autonomous organization, its main purpose is to promote and coordinate higher education. The UGC has taken much initiative in developing university and college libraries. Taking into account the significant role of library in education, the UGC has acted upon the recommendations of many committees. Apart from academic function of the UGC, it provides financial assistance to universities and colleges for purchase of books and journals, for the development of infrastructure, purchase of equipment's etc. The UGC provides funds to universities and colleges for expansion of academic matters.[5]

After Independence, the development of higher education was very fast. There were very few colleges before independence. After Independence, there is remarkable increase in the education institutions in various disciplines of science, technology, computer, medical and agriculture. Higher education is always being criticized in terms of economy. Higher education fulfils the demands of the regional and local employer for getting skilled employees. After all higher salaries are paid

to graduates during their lifetime which helps to increase the quality of their life.

Growth of Higher Education Institutions in India.

Sl. No.	Year	No. of Universities	No. of Colleges
1	1951	28	578
2	1961	45	1,816
3	1971	93	3,227
4	1981	123	4,738
5	1991	177	7,346
6	2001	266	11,146
7	2011	523	33,023
8	2012	574	35,539
9	2013	666	39,671
10	2014	711	40,760

Source: Website of UGC and Annual Report 2014-15 of UGC.

The growth rate of educational institutions in India was very slow before independence in 1947. Since independence there has been substantial growth in the number of academic institutions – both universities and colleges in the last 60 years.

The above table shows that in the year 1951 the country had just 28 University level institutions this figure has gone up to 711 in 2014. The growth of degree colleges during the period has been even larger, more than 47 times. The number of colleges has gone up from 578 to 40,760.

3. ACADEMIC LIBRARY SYSTEM:

Libraries in the educational institutions are concerned with the teaching and learning process experienced by specific communities.

A library which is an integral part of a college, university, or other post-secondary educational institution (higher education), administered to meet the needs of its students, faculty, and staff for scholarly information and research services is the academic library. Large college or university libraries often have separate libraries within individual academic departments or schools which have

a collection devoted to their subject or discipline such as chemistry, mathematics etc.

4. The general objectives of the academic libraries are:-

i) To serve the curricular, cultural and general education requirement of the academic community;

ii) To provide reference material at appropriate levels;

iii) To provide study areas of users;

iv) To provide a lending service appropriate to different types of users;

v) To provide an active information service.

These libraries are located on the campuses of colleges.and universities and serve primarily the students and faculty of that institution and other academic institutions. Some academic libraries are also accessible to the general public in whole or in part, although borrowing privileges are often limited for users affiliated with the college or university only.

5. ROLE OF ACADEMIC LIBRARIES IN HIGHER EDUCATION:

Regarding higher education, the college libraries are not only trying to increase digital resources for the students but also trying to provide the knowledge to the common people which are significant feature of the age of information.

Information of higher education have their inception developed on libraries, and as such libraries are established as an integral part of higher level for successful implementation of their academic and research pursuit. This role of the library in supporting higher education has assumed greater importance and new dimensions now due to variety of factors especially knowledge explosion which is ten times more than the population explosion.

The primary aim of higher education is to impart specialized and advanced knowledge to students and expertise in various fields of human activity meant for all-round social progress and enrichment of human life. The substitute to knowledge explosion is the establishment of a sound and well equipped library with primary, secondary and tertiary sources with latest electronic devices. Library As a place of recreation, information and inspiration, be given top attention because library is a social institution to enlighten the citizenship and highlight the new generation of our past, present and future.

6. Dr.Radhakrishan Commission Report (1948-49) describes library in higher educations:

"The library is the Heart of all university works; directly so as regards its research works and indirectly as regards its educational work scientific research how it is being maintained and utilized."

7. National Policy on Education (1986):

The Government of India admitted failures in implementations and owned the responsibilities for not providing financial and organizational support to the required extent. To overcome the shortcomings and to make education more effective, Knowledgeable and to keep pace with the new developments in science and technology, the new policy on education was introduced in 1986.

Based on the Kothari Commission Report, a national policy on education was formulated by the Government in 1986. It laid stress on imparting education through regional languages; this policy was to be reviewed after every five years. On 5th January 1985, the Prime Minister of India promised to formulate a new education policy in order to prepare the country for the 21stcentury. And finally a document Challenge of Education: a policy perspective was placed before the Indian Parliament on 20th August 1985. The document made a survey of existing educational scenario and suggested the task ahead. It was severely criticized for not emphasizing the role of libraries. However, a revised document on New Educational Policy was prepared and submitted to the Parliament in 1986.

8. Functions of New Education policy in the higher education through library:

Higher education is a part of the nation's agenda for its development and change, and the library should play a pivotal role though the following supportive functions.

1. **Perspective plan:** Planning is an essential of life. It establishes framework of deciding not only what to do? But when? How to do it. Planning produces rationality and order in an organization. Therefore, it should not be a one shot affair, but it should be a continuous process to meet the challenges in techno-educational fields.

2. **Implementation of the plan:** Although planning takes time and is a continuous process, but there is no substitute if success is to be achieved. To implement the plans a good liaison between library and its users will certainly improve the

present situation, they only it will meet its objectives.

3. **Easy Accessibility:** The various services should be easily available to the users and should be provided at the earliest possible time. Direct use of library should be identified for the common good.

4. **Freedom of Library:** The clients should have all reasonable freedom to access the various services and resources. They should be allowed to have free dialogue with the co-operation. This co-operation attitude will strengthen the library as a social institution.

5. Collection Development: Collection development is a gradual work. It should be a shared activity between the library and users. Collection development should give great sense of library needs and use. The collection should serve not only curricular and research needs, abut also should be a universal character.

6. **User Orientation:** In the absence of orientation and training, the students of higher education feel handicapped in using the resources. Their poor communication skill and lack of confidence, etc. can be remedied through in house training in every institute of higher education.

7. Accountability and Assessment: Accountability of services, resources and users should be honestly studied. The services can maintain their genuineness only through regular and objective assessment. The various components of the library are the resources, staff and building must be subjected to the evaluation of library

9. RECENT TRENDS IN ACADEMIC LIBRARIES:

Libraries are established for the systematic collection, organization, preservation and dissemination of knowledge and information. It is very important for man to preserve and maintain the valuable knowledge and information contained in the books and documents because we want to preserve our knowledge and wisdom for the coming generations. By preserving the documents in a library this knowledge can be made available to others so that they can benefit from it. Establishment of libraries is not a new concept. The oldest library dates to around 2700 years ago in Sennacherib's Palace in Nineveh which shows how long ago the concept of leaving a piece of your wisdom behind started being formed into the organized collection to preserve the work.

With the invention of printing press, it became easier to preserve the knowledge in the form of printed documents. This led to the generation of a large number

of books. The need for the preservation and dissemination of information led to the establishment of more and more libraries. Thus libraries acquired a great importance in the civilized society for education and research. Libraries play a vital role in the development of any society by enhancing the cause of education and academic research. They cater to the information needs of thousands of peoples.

The development of Science and Technology (S & T) in the last two centuries has led to an information explosion. Rapid changes have taken place at a great pace. In order to meet the growing needs of users the library system has been greatly improved and upgraded to meet the new challenges. The services offered by libraries have also undergone a great change. With the advent of new technologies in the field of computers and telecommunications, revolutionary changes have taken place in the field of Library and Information Science. The shape of traditional libraries containing a large number of printed documents is in the process of being transformed to paper less libraries containing a large number of digitized documents. The facilities offered by networking have not left libraries untouched. Modern libraries are not only digitized but networked also. This has led to the creation of virtual libraries i.e. libraries without walls through which the user has access to information at anytime, anywhere in the world by using the modern tools of communications, such as computers and Internet facilities.

10. CONCLUSION:

The development of higher education and libraries in India as compared to the pre-Independence period is much faster and qualitative in the post-Independence era. The major factors responsible for such a development were the University Education Commission of 1948-49, the Kothari Commission of 1964-66, and the birth of University Grants Commission in 1956. The UGC took special interest in academic libraries and with the help of its Library Committee and its recommendations related to space, staff, equipment's, collection development, services etc., followed by its curriculum development committees, establishment of INFLIBNET for the networking of academic libraries and the institutions of higher education and learning and the establishment of UGC-INFONET Digital Library Consortium.

The central mission of a library is to collect, organize, preserve, and provide access to knowledge and information. In fulfilling this mission, libraries preserve a valuable record of culture that can be passed down to succeeding generations. Libraries are an essential link in this communication between the past, present, and future. Whether the cultural record is contained in books or in electronic

formats, libraries ensure that the record is preserved and made available for later use. Libraries provide people with access to the information they need to work, play, learn, and govern. People in many professions use library resources to assist them in their work and to gain information about personal interests or to obtain recreational materials such as films and novels. Students use libraries to supplement and enhance their classroom experiences, to learn skills in locating sources of information, and to develop good reading and study habits. Public officials use libraries to research legislation and public policy issues. One of the most valued of all cultural institutions, the library provides information and services that are essential to learning and progress.

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Role of Infographics in Marketing Information products and services in Libraries: A study

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Abstract: Infographics were used to support the work of journalism in old days. It may be used to accommodate newspapers, newsletters, magazines, and reports. Now the infographics have been used for telling the story. In addition, the moving lifestyle in digital age, data and information need to be faster and easier processed. People see for the headlines and graphics (usually in pictures, charts, graphs) that invite their interest. They devote less time to study whether it is worth further reading. Multimedia infographic can be created in 3D to make it more attractive than regular expressive pictures and text, especially for the tough and difficult contents. For the people who need to communicate speedily; the vocalized or printed account is sometimes too hard for understanding. In this paper have covered the Characteristics, types, tools, benefits, Type of infographics used for marketing of the Library products, services and reports in general making infographics efficiently.

Keywords: Infographics, Marketing, Libraries, Information products, Information services

1. Introduction

A picture is worth a million words. Now a days, culture is surrounded within an Information drenched environment, thus emerging educational resources that capture customers attention is an ever rising task for Extension educators. This is due in a big part to the sum of media customers are uncovered to on a daily basis. On regular, adults consume shocking 13.6 hour of media each day

2. Infographics

Infographics are visual representations of data, information or knowledge that are often convoyed by text. They are designed to tell multifaceted information more visibly than over text alone. Using words, symbols, numbers, pictures, and colors infographics links to a key message to the reader by telling a story.

3. Characteristics

The true art of an infographic is in defining a way to tell the true story behind the numbers. There are amount of stuffs that should be taken into deliberation when creating an infographic. Here are nine key characteristics to keep in mind:

A) Visual Interest

Reflect about the kinds of things that catch your attention. When you are walking past a stand of magazines or scrolling through a web page, take the while to observe the colors and formats that keep your attention. If you want individuals to pay attention to your infographic, you cannot just do the same old things – you have to be innovative.

B) Theme

Should be specific as you can be once it comes to theme. Just like once you write blog posts, if you have your facts too common you won't attract as much attention. A targeted theme that combines your areas interests with innovative flair is constantly a great choice.

C) Detail

The capability to share a lot of information in a small sum of space is part of what makes infographics so powerful. Be sure to devote equal extents of time and concern into both the data you share and the means in which you share it.

D) Meaning

There are a lot of thoughts that could have perceptive visual representations, but not all of them are relevant to the business and what it is trying to convey. Giving the design shall make some weight by relating it back to our interest and goals.

E) Action

An infographic that simply repeats information without putting any twist or analysis it is not somewhat that people will be interested in. In order to be motivating, a design has to have "action" – it should do something. It can compare or teach or design or list, but it must assist some sort of explanatory function.

F) Color

Color is influential thing. An easy color scheme will contain colors that are already in website design, but in diverse shades and tones so they won't mixture in too much with website, blog or print media. If you want to go further, consider that diverse colors are known to carry different moods. Blue, for instance, calming – if your goal is to connect a calm vibe, then a blue color scheme might work for you.

G) Typography

Fonts can go extended way toward associate different themes. For example, a font like Courier New is excessive for a graphic that uses a lot of procedural information, because it has a clean look and is readable even at very small sizes. As you would with color, testing with typography to find the right mixture for infographic.

H) Distribution

Throughout the entire formation process, keep in observance how to plan to get infographic onto the web and mark it easy and attractive for people to share.

I) Social

Social podiums may be the finest way to share infographic once it has been published – tweeting, sharing, bookmarking and posting to Business to Business (B2B) social media podiums. There are a number of different social networks that can serve as medium for infographic, from Facebook to Flickr to Twitter to Tumblr and beyond.

Creating infographic does not have to be tough or confusing, as long as you keep it innovative. Keeping all of the above characteristics into consideration can help to create an infographic that is both informative and attractive, which in turn will benefit to optimize lead promotion and lead generation.

4. Types of Infographics

Type	Description	When to Use

Visualized Article/ Image	Reviews the main points of a text-huge article with a visual picture	-Delivering information speedily to user -Presenting an article topic -Connecting with low-literate audiences
Procedural	Provides "how-to" increasing consumers" knowledge of the order of events that can be taken to complete an action	-Enhancing users process understanding -Strengthening learning of a arrangement of events
Research/ Statistical	Shortens scientific data into a numerical graphic to increase users" knowledge of research Results	-Brief research results -Describing frequency rates
Comparison	Relates two or more thoughts side-by-side, highlighting differences/ similarities	-Distinguishing two similar entities -Assisting users in making a choice -Helps in a cost/benefit analysis
Timeline	Graphically exhibitions a list of significant events in chronological order	-Offering order of historical events -Informing users of project timelines
Flow Chart	Guides the user through a sequence of questions to regulate an answer	-Replying a question -Finding an object based on describing characteristics

Type of infographics used for Libraries

Marketing of the Library products

Library products	Types of Infographics used
Library Floor Map	Flow Chart

Collection Statistics Number of Books Number of Titles Number of Journals Number of Theses Number of CD's/DVD Number of Online Databases	Research/Statistical
Stack Section Floor Guide Rack/Shelf Guide Subject Guide	Procedural
Circulation Rules Timing Overdue information	Timeline
Acquisition Procedures to follow	Procedural
Technical Process and Procedures	Procedural
Periodical New Arrivals display Archives	Flow Chart

Marketing of the Library Services

Library Services	**Types of Infographics used**
Current Awareness Services/ Selective dissemination of Information Sending E-mailers	Flow Chart
Lending Service Working hours Over Due time	Timeline
Document delivery service Guidelines to follow	Timeline

OPAC Services Instructions to retrieve the bibliographic details	Flow Chart
Archival Services Instructions to retrieve the document	Flow Chart
Interlibrary Loan Guidelines to follow	Procedural
Go to Market Service Sending E-mailers on Book fairs Providing free magazines	Visualized Image

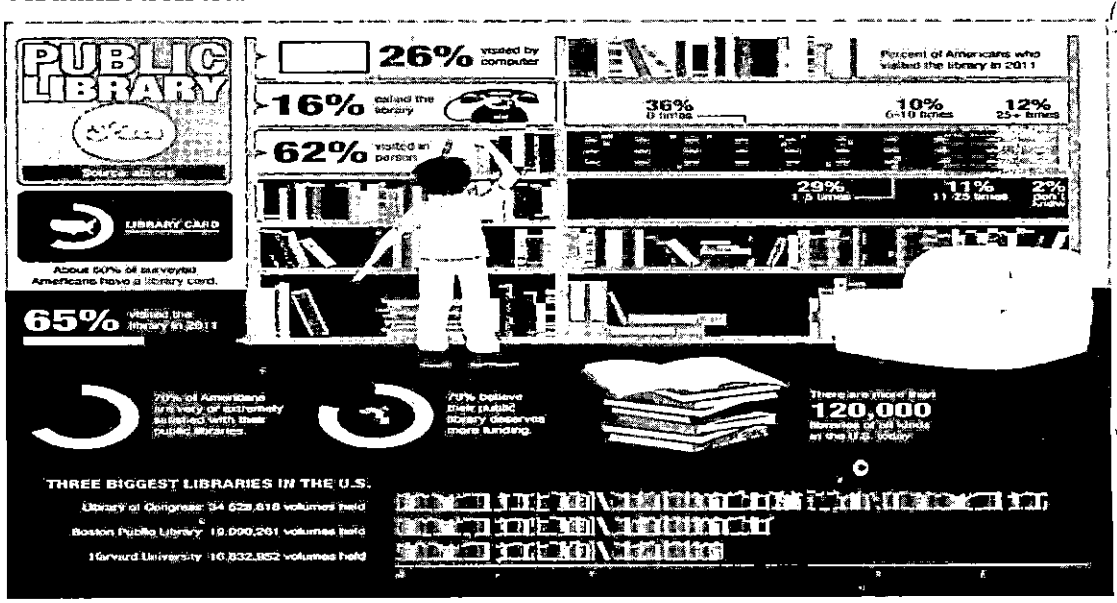
• 5.3 Generating Library Reports

Infographics can also be used in generating reports as follows

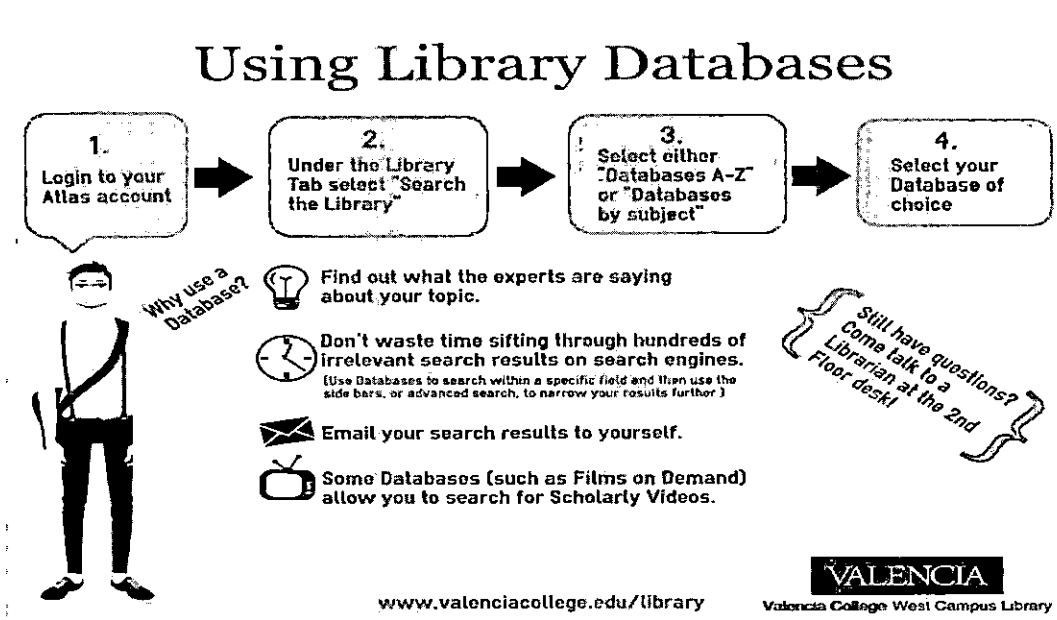
Library Reports	Types of Infographics used
Daily Report Circulation report Attendance report Visitors report Incident report	Visualized Article
Annual Report Library committee report Budget allocation report Collection development report Weed out report Book Binding report Stock verification report Incident and action plan report	Visualized Article

Examples of infographics used

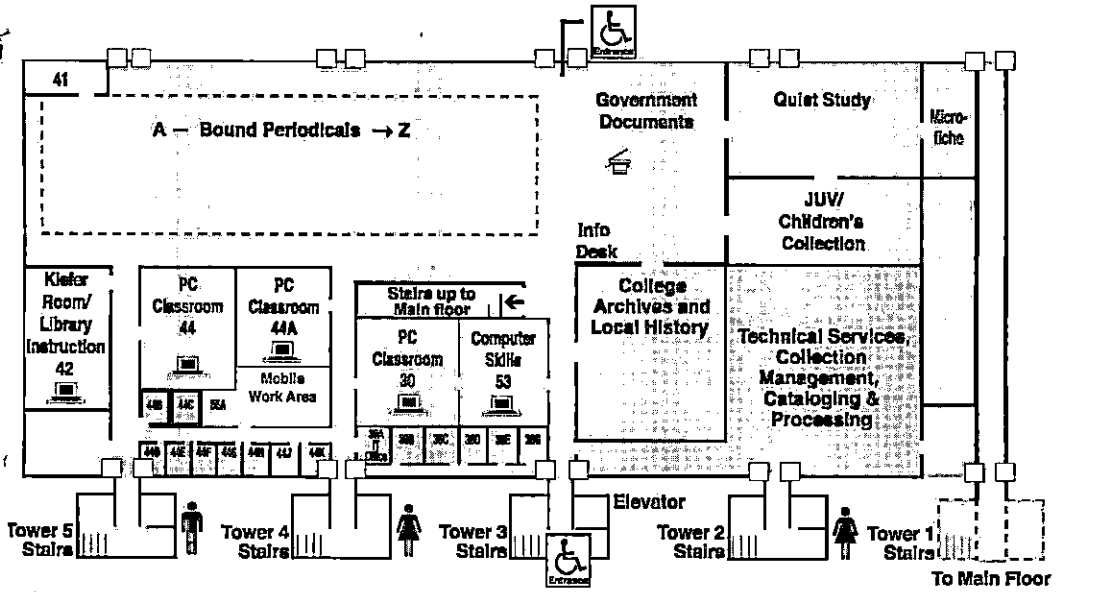
Visualized Article



Procedural

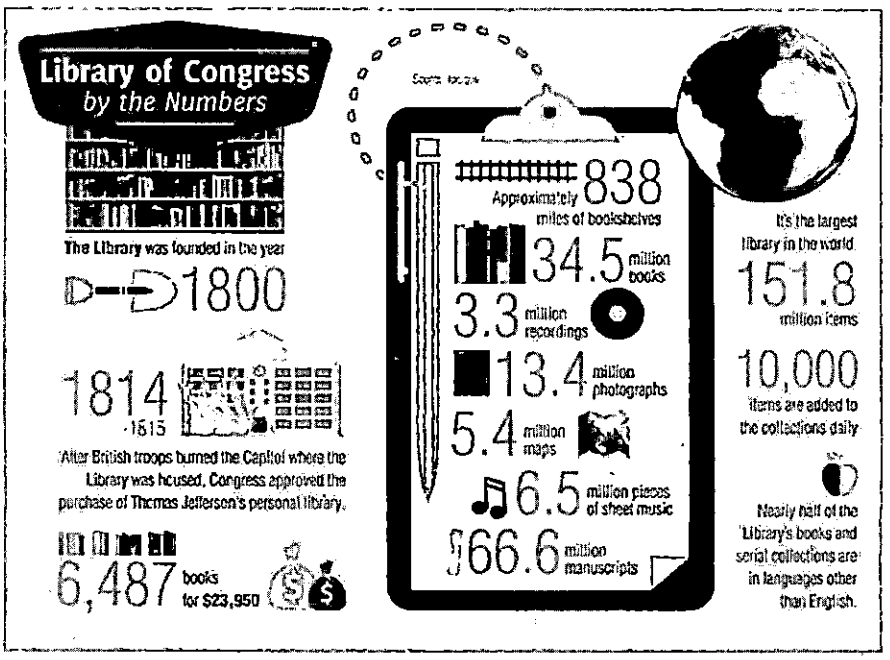


Flow Cart

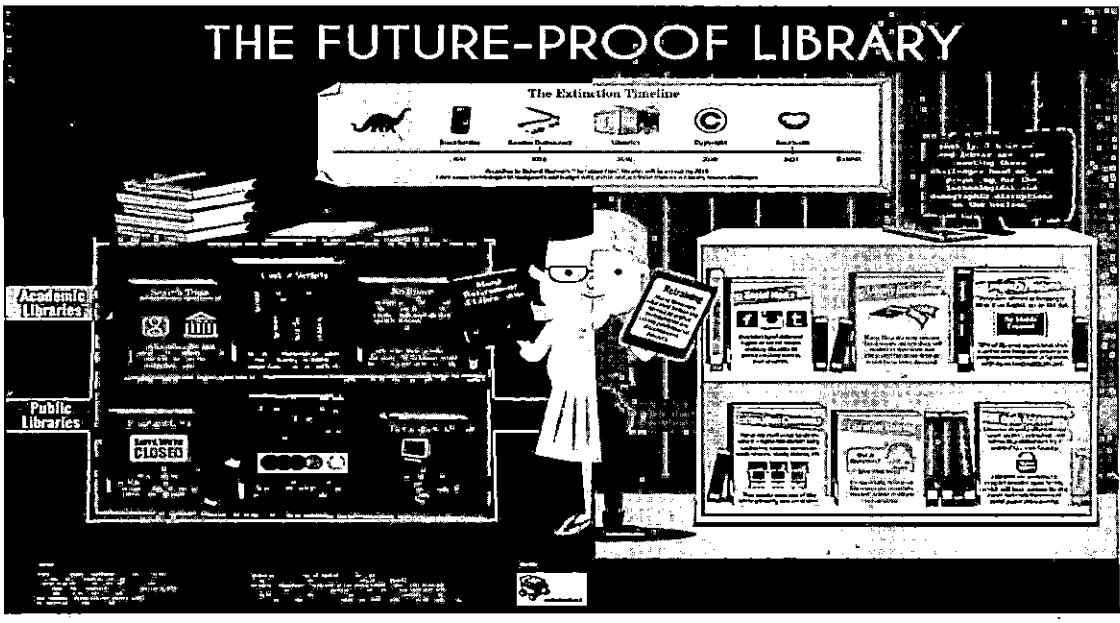


GROUND FLOOR

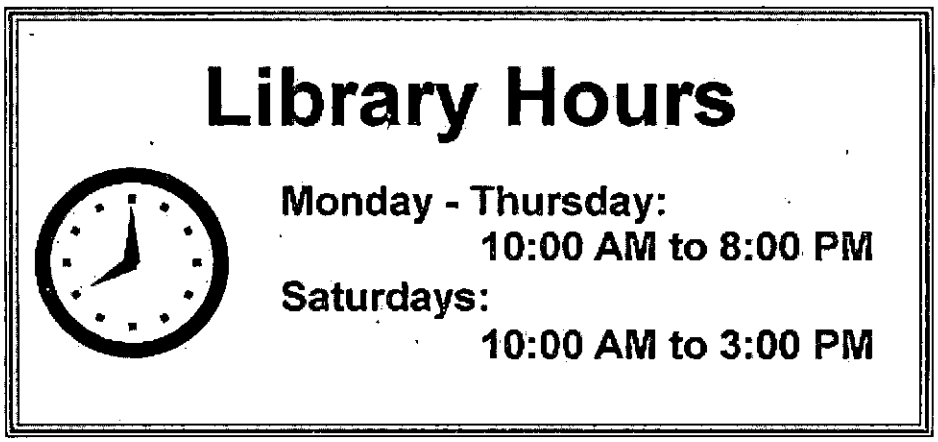
Research/Statistical



Comparison



Timeline



5. Infographics Tools

There are many quick and easy tools online to help you create your own infographics without a design background. All of the services below are free with some having a paid subscription option for more features.

Tool	Description
Canva	Drag and drop the graphic design for infographics or presentations
Picktchart	Infographic originator with templates drag and drop facilities
Info.gram	30 plus chart kinds available, finest for data rich designs
Easel.ly	Best for qualitative data and can upload images

6. Benefits of Using Infographics in Libraries

Infographics Are Eye-Catching

Infographics are eye-catching than printed words, since they chain images, colors, content and movement, that naturally draw the eye. Since most of us have progressively shorter attention spans, we tend to scan material as opposite to reading text. Infographics permit us to simply scan and get the information we are most attracted in.

Infographics Get Shared More

Infographics are enormously shareable for use around the web. For example, an infographic available on a WordPress blog or website typically offers an embed code. This code allows an automatic link from the unique site to yours. They are also easily shared on social webs and have a better chance of fetching viral related to normal text.

They Increase Brand Awareness & Reach

Infographics can be used to strengthen the brand, merely because they are so visually appealing. If you design an infographic with reliable colors, shapes, and messages, along with logo, have an effective means of Brand Awareness. Plus, since they get shared much, you are increasing the reach of your brand in a tremendously natural way.

They Improve Search engine optimization (SEO)

A well-designed and appealingly pleasing infographic will drive people to your site, since they are more possible to share and click on it. Infographics are also probable to get links from other sites when people share infographic.

Infographics Help You Connect With Your Audience

Lastly, infographics are a fun and appealing medium that can produce a unique connection with visitors to the site or a location that has featured infographic. Since they are meant at educating, not selling, infographics also help generate a sense of linking which will probable pay off later.

Learn How To Design Your Infographic

It helps even more effectively to design infographics by keeping present in the mind of user's requirement which helps to give good services.

7. Conclusion

It is clear that infographics are a great way to create a visually pleasing, easy to understand piece of content. But, it also can spread awareness of library product and services. Creating an infographic doesn't have to be complicated. There are various free tools available in online, which can be used for the libraries to promote their products and services.

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Scientific Productivity and Collaboration in the field of Economics

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Abstract: In the present paper an attempt has been made to investigate the pattern of authorship type of collaborated research and the degree of collaboration in the field of Economics. The data was collected from Social Science Citation Index of ISI Thomson Reuter, for the period of fifteen years i.e 2000-2014. This was divided in three block periods. The mean number of CI and DC go together in an increasing order from one block to another indicating progressive trend in the collaborative research, Collaborative Index (CI) and Degree of Collaboration (DC) and Collaboration Coefficient (CC) have been calculated which shows in an increasing order from one block to another indicating a progressive trend in the collaborative research.

Keywords: Collaboration, Collaborative Index, Degree of Collaboration, Collaboration Coefficient

1. Introduction

The collaboration is an integral part of research since long time. It is a mutual involvement of participants in a coordinated effort to accomplish certain task together. The collaboration interactions are characterized by shared goals. Symmetry of structure and a high degree of negotiation. Interactivity and interdependence the sharing of goals may be interdisciplinary, interdepartmental or interinstitutional. The interdisciplinary collaboration has increased the productivity of research and encouraged the development of innovative new strategies in investigation of new things and ideas.

The Economics is a vast discipline and there is a scope for interdisciplinary growth, because of collaborative work done by Social Scientist who belongs to different disciplines. The present study has been done in order to know the

Authorship pattern and Collaborative measures in the Economics.

It has been found from the earlier studies that collaboration in research varies from discipline to discipline and for the same discipline from time to time and from one country to another. Some of the notable studies in the field are Lawani (1986), Subramanyam (1993), Sangam (2012), Maheshwarappa (1987), Gupta (2000), Sangam (2009), Sangam and Mogali (2013) etc. In the present study an attempt has been made to know the Authorship pattern and Collaborative measures in the Social Science.

2. Methodology and Database

The present study has been done by referring to Social Science Citation Index of ISI web of knowledge published by Thomson Reuters. According to the index the Economics has large number of subfields and the quantum of literature output is too much to handle. Therefore only 31 subfields of Economics have been selected for analytical study. Further these 31 subfields of economics have been grouped into five fields namely Management, Agricultural Economics, Business and Finance, Transport and Industrial Relations and Labour. The data with regard to authorship pattern and collaborative measures has been considered for the period 2000-2014 only. The collaborative Index, Degree of Collaboration and were determined based on year-wise output of publications.

3. Analysis and Interpretation

3.1 Collaborative Publication

Table-1 shows the distribution of total single author publications and total collaboration author publications in three block periods 2000-2004, 2005-2009 and 2010-2014 subject wise.

Table-1 Distribution of Single author publication and Collaborative author publications in three block periods during 2000-2004, 2005-2009 and 2010-2014

	Management				Agricultural Economics				Business and Finance			
Block Period	SA		CA		SA		CA		SA		CA	
	T	%	T	%	T	%	T	%	T	%	T	%
2000-2004	177	19.89	147	22.35	59	16.43	16	8.98	14	15.22	11	18.96
2005-2009	278	31.23	204	31.00	128	35.66	67	37.65	40	43.48	19	32.76

2010-2014	435	48.88	307	46.65	172	47.91	95	53.37	38	41.30	28	48.28
Total	890	100	658	100	359	100	178	100	92	100	58	100

	Transport				Industrial Relations and Labour			
Block Period	**SA**		**CA**		**SA**		**CA**	
	T	**%**	**T**	**%**	**T**	**%**	**T**	**%**
2000-2004	17	34.69	6	24.00	71	11.86	120	16.98
2005-2009	20	4082	12	48.00	131	21.86	242	34.23
2010-2014	12	24.49	7	28.00	397	66.28	345	48.79
Total	49	100	25	100	599	100	707	100

SA = Single authored Publications, CP = Collaborative Publications, % = Percentage, T = Total

In management there is an increasing trend both in single author publication an collaborative author publication however a slight increase is seen in collaborative author publication in 2010-2014. In agricultural economics is a decreasing trend in single author publication and collaborative publication but in 2000-2004 and 2005-2009 SA predominates over CA, while in the third, it shows the CA predominates over SA. It indicates an increasing trend of collaboration. In Transport there is a constant increase both in SA and CA in all the three block period. However a slight increase in CP is observed in block 2010-2014 In case of Industrial Relations and Labour there is a constant increase in SA while CA shows a sudden increase up to 66.28% in the third block period showing much inclination towards collaboration. The overall inference that can be drawn is the collaborative publication showing an increasing trend.

4. Distribution of publications classifieds by number of authors in block period

Table-2 shows the distribution of publications according to the number of authors in the five main sub disciplines. In Management the single numbers of authors are 890 which are the highest and it is 139 in case of three authors which is least whereas four and above and three authors are almost equal in number. This is an indication that team of researchers are more in Management. When we the take number of authors block-wise, certainly there is an increasing trend in single, two, three and four and above.

In Agricultural Economics single authors are 359 followed by two author 95 and then three author 48 and lastly the four and above are 35. Here also there is an increasing trend in all the four categories of authors.

In Business and Finance and transport are less contributes the authors. The single author number in the first block is more and decreased in second block. This trend holds well even in two, three authors also.

Table-2 Distribution of publications classifieds by number of authors in block period during 2000-2004, 2005-2009 and 2010-2014

	Management				Agricultural Economics				Business and Finance			
Block Period	S	D	T	Four and above	S	D	T	Four and above	S	D	T	Four and above
2000-2004	177	77	34	36	59	8	5	3	14	8	2	1
2005-2009	278	101	57	46	128	36	17	14	40	13	4	2
2010-2014	435	137	113	57	172	51	26	18	38	14	6	3
Total	890	315	204	139	359	95	48	35	92	35	12	6

	Transport				Industrial Relations and Labour			
Block Period	S	D	T	Four and above	S	D	T	Four and above
2000-2004	17	3	3	0	71	54	44	22
2005-2009	20	7	2	3	131	106	81	55
2010-2014	12	2	5	0	397	161	121	63
Total	49	12	10	03	599	321	246	140

Again in Industrial Relations and Labour the major share is of single authors, then two authors, four and above authors and lastly three authors. The block-wise distribution shows that there is an increasing trend in single and four and above authors. While two and three authors category shows little decrease in the second block period. The overall picture shows that the major contribution is from single authors. The multi author contribution in all the 5 sub disciplines from one block to another block is more which is an indicator of collaborative research.

Table-3 Relative Frequency of Publications by number of authors in block periods during 2000-2004, 2005-2009 and 2010-2014

	Management					Agricultural Economics				Business and Finance		
Block Period	S	D	T	F and above	S	D	T	F and Above	S	D	T	F and above
2000-2004	0.1988	0.2444	0.1666	0.2589	0.1643	0.0842	0.1041	0.0857	0.1521	0.2285	0.1666	0.1666
2005-2009	0.3123	0.3206	0.2794	0.3309	0.3565	0.3789	0.3541	0.4	0.4347	0.3714	0.3333	0.3333
2010-2014	0.4887	0.4349	0.5539	0.4100	0.4791	0.5368	0.5416	0.5142	0.4130	0.4	0.5	0.5

	Transport				Industrial Relations and Labour			
Block Period	S	D	T	F and above	S	D	T	F and above
2000-2003	0.3469	0.25	0.3	0	0.1185	0.1682	0.1788	0.1571
2004-2007	0.4081	0.5833	0.2	1	0.2186	0.3302	0.3292	0.3928
2008-2011	0.2448	0.1666	0.5	0	0.6627	0.5015	0.4918	0.45

5. Relative Growth of Publications by number of single authored V/S Multiauthored

The relative growth of single and multi author publications was analyzed in terms of relative frequency of publications. The relative frequency has been calculated by taking the number of publications (single/multi-author) and by dividing the same by total number of publications (single/multi-author).

In Management the relative frequency is showing an increasing trend and more so in the case of four and above. In Agricultural Economics the same trend is observed. In Business and Finance there is a decrease compared to the first block in Single, Double and Three authors frequency. Again it has increased in the third block. In four and above authors category, there is an increase block by block. In transport the single, double and three and four and above authors contribution is less. In industrial relations and labour the frequency of single and four and above authors the frequency has increased considerably from one block to another block period, whereas in case of double and three authors in the second block period, there is a decrease when compared to first block period.

Table-3 shows the relative frequency of publications by number of authors in the three block periods that is from 2000-2004, 2005-2009 and 2010-2014.

In Management there is an increase from one block to another block in all category of authorship pattern. In Agriculture Economics the same trend is observed. In the case of Business and Finance the three blocks that is 2010-2014 shows a decrease in the category of three and four authors whereas in the single and double authors there is an increase compared to the first block period. In transport except single and double authors in 2005-09 blocks an increasing trend is observed in three and four authors are decreased. In industrial relations and labour except in the second block that too in double and three publications, there is an increase in all other categories of authorship categories. The overall figures show that the frequency of publication is more in block period 2010-2014 in all the five subjects which clearly indicates the positive trend of publication accompanied by collaboration.

6. Collaboration Measures

The measures Degree of Collaboration (DC), first suggested by Subramanyam, which take the proportion of co-author publications in total publication, the Collaboration Index (CI), by Lawani, Which takes the mean number of authors per publication have been studies.

Table-4 shows mean number of authors per publications in Management, 1.07 in the block 2000-2004 and increased to 1.08 in 2010-2014. The degree of collaboration remains the same in all the three block periods.

Table-4 Collaboration obtained from publication in different block periods during 2000-2004, 2005-2009 and 2010-2014

Block Period	Management		Agricultural Economics		Business and Finance		Transport		Industrial Relations and Labour	
	CI	DC	CI	DC	CI	DC	CI	DC	CI	DC
2000-2004	1.07	0.68	1.34	0.63	1.56	0.73	1.69	0.69	1.22	0.76
2005-2009	1.09	0.65	1.26	0.65	1.32	0.66	1.71	0.73	1.27	0.77
2010-2014	1.08	0.64	1.35	0.67	1.34	0.68	2.26	0.78	1.07	0.6

In Agricultural Economics also the mean of collaborative index 1.34 in the first block has raised to 1.35 in the last block period. Whereas the DC is almost same with little increase. In case of Business and Finance, Transport and Industrial Relations and Labour the same the Collaborative mean which is lower in the first block has gradually increased in the second and third block. The same phenomenon is also observed in Degree of Collaboration also.

The result obtained by the computation reveals that the CI and DC are increasing along with the time period indicating the team work of the professionals in the field of Economics.

7. Basic Statistics of Authorship data in different subfields in three block periods

The authorship pattern in different subject fields in the five block periods 2000-02, 2003-05, 2006-08, 2009-11 and 2012-14 has been studied with reference to India.

Table-4 indicate the authorship pattern in different subject fields in the five block periods 2000-02, 2003-05, 2006-08, 2009-11 and 2012-14. It is observed that the mean value has increased from one block period to another in Management, Agricultural Economics, Transport and Industrial Relations and Labour, whereas there is a slight decrease in the second block period with respect to Business and Finance.

In Management the mean value 1.96 has increased to 2.14. In Agricultural Economics the mean value 1.41 to 1.42, in Business and Finance the mean value

Table-4 Basic Statistics of Authorship data in different subfields in three block periods 2000-2002, 2003-2005, 2006-2008, 2009-2011 and 2012-2014

	Management		Agricultural Economics		Business and Finance		Transport		Industrial Relations and Labour	
Block Period	Mean	Variance	Mean	Variance	Mean	Variance	Mean	Variance	Mean	Variance
2000-2002	2.1402	1.2811	1.4146	0.7793	1.4286	0.3878	1.5000	0.6250	2.1143	0.9965
2003-2005	1.9494	1.0255	1.4074	0.5377	1.6250	0.7344	1.1250	0.1094	2.1318	1.0602
2006-2008	1.6242	0.8206	1.6239	0.9184	1.5526	0.7209	2.0000	1.3333	2.1584	1.1740
2009-2011	1.8582	1.1951	1.6533	0.8999	1.3409	0.4065	1.4400	0.4864	1.9107	0.9846
2012-2014	1.6981	0.9174	1.4286	0.6735	1.7576	0.9109	1.6000	0.8400	1.7746	1.0541

Table-5 Parameter value obtained from application of selected probability distribute one to the distribution of authorship in publications in different subfields in block periods from 2000-2002, 2003-2005, 2006-2008, 2009-2011 and 2012-2014

Parameter Value						
Block Period	Management		Agricultural Economics		Business and Finance	
	Geom P	Poison λ	Geom P	Poison λ	Geom P	Poison λ
2000-2002	0.339	0.1423	0.4141	0.243	0.4118	0.2396
2003-2005	0.3895	0.2087	0.4154	0.2448	0.3809	0.1969
2006-2008	0.3811	0.1971	0.3811	0.1971	0.3917	0.2117
2009-2011	0.3499	0.15559	0.3768	0.1914	0.4272	0.2616
2012-2014	0.3706	0.183	0.4118	0.2396	0.3626	0.1725

1.42 to 1.75, and in Transport the mean value 1.50 to 1.60. This indicates the increasing trend of collaborative research publication.

Whereas in Industrial Relations and Labour the mean value in the first block period is 2.11 and it decreased to 1.77. As far as variance is concerned, the same pattern is observed but the degree of variance varies from subject to subject.

It is observed the highest contribution is from Management then followed by Agricultural Economics, Business and Finance, Transport and then and at last Industrial Relations and Labour.

8. Application of Selected Probability Distribution to the Distribution of Authorship in Publication

Five sub disciplines of economics viz., Management, Agricultural Economics, Business and Finance, Transport and Industrial Relations and Labour during the block periods 2000-02, 2003-05, 2006-08, 2009-11 and 2012-14 have been chosen to explore the goodness of fit by applying Geometric, and Truncated Poisson statistical distributions.

Table-5 shows in Management the geometric distribution shows 0.339 to 0.3895 in the second block and again decreased to 0.3499 in the forth block. The Truncated Poisson distribution shows 0.1423 in the first block and raised to 0.2087 in the second block and last block decreased in the last block.

In Agricultural Economics the geometric distribution shows 0.4141 to 0.4118 in the last block. The Truncated Poisson distribution shows a decreasing trend i.e. 0.243 in the first block and it is raised to 0.2396 in the last block.

Parameter Value				
Block Period	**Transport**		**Industrial Relations and Labour**	
	Geom P	**Poison λ**	**Geom P**	**Poison λ**
2000-2002	0.4	0.2231	0.3211	0.1207
2003-2005	0.4706	0.3246	0.3193	0.1186
2006-2008	0.333	0.1353	0.3166	0.1153
2009-2011	0.4096	0.2369	0.3436	0.1479
2012-2014	0.3846	0.2019	0.3604	0.1696

In Business and Finance the geometric distribution shows 0.4118 to 0.3626 in the last block. The Truncated Poisson distribution shows a decreasing trend i.e 0.2396 in the first block and 0.1725 in the last block.

In Transport the geometric distribution shows 0.4 to 0.3846 in the last block. The Truncated Poisson distribution shows 0.2231 in the first block and raised to 0.3246 in the second block and again decreased to0.2019 in the last block.

In Industrial Relations and Labour the geometric distribution shows 0.3211 in the first block and 0.3604 in the last block. The Truncated Poisson distribution shows 0.1207 in the first block and decreases to 0.1153 in the third block and again increases to 0.1696 in the last block.

In Management, Agricultural Economics, Business and Finance there is an increasing trend in Truncated Poisson value. Similarly the geometric distribution shows decreasing trend from one block to another block in all the five subjects, as far as varies from subject to subject and from one block to another.

9. Chi-Square value and degree of Freedom obtained from fitted distribution to the distribution of authorship in publications

The chi-square value and degree of freedom obtained from fitted distribution of authorship in publications in different block periods 2000-02, 2003-05, 2006-08, 2009-11 and 2012-14. In order to understand the distribution pattern of authorship and their goodness of fit in publication pattern Geometric and Truncated Poisson distributions have been applied.

Table-7 Chi-Square value and degree of Freedom obtained from fitted distribution to the distribution of authorship in publications in different block periods from 2000-2004, 2005-2009 and 2010-2014

Statistical Model for Distribution						
Block Period	Management		Agricultural Economics		Business and Finance	
	Geom P	Poison λ	Geom P	Poison λ	Geom P	Poison λ
2000-2002	0.339	0.1423	0.4141	0.243	0.4118	0.2396
2003-2005	0.3895	0.2087	0.4154	0.2448	0.3809	0.1969
2006-2008	0.3811	0.1971	0.3811	0.1971	0.3917	0.2117
2009-2011	0.3499	0.15559	0.3768	0.1914	0.4272	0.2616
2012-2014	0.3706	0.183	0.4118	0.2396	0.3626	0.1725

Statistical Model for Distribution				
Block Period	Transport		Industrial Relations and Labour	
	Geom P	Poison λ	Geom P	Poison λ
2000-2002	0.4	0.2231	0.3211	0.1207
2003-2005	0.4706	0.3246	0.3193	0.1186
2006-2008	0.333	0.1353	0.3166	0.1153
2009-2011	0.4096	0.2369	0.3436	0.1479
2012-2014	0.3846	0.2019	0.3604	0.1696

In Table-6 the Management in the first block period Geom Chi-Square value shows an increase from 64.12 to 1353.65 and in case of Poisson the chi-square increased from 140.74 to decreases to 124.34 in the last block. Similarly in Agricultural Economics during the first block the Geom chi-square value 66.68 decreases to 13.34 in the last block. Poisson value two is an increasing trend from one block to another.

In case of Business and Finance during the first block the Geom Chi-square raises from the first block to second block and falls down in the forth block. Whereas there is a constant decrease from one block to another block in the Poisson chi-square value. In Transport the Geom, and Poisson chi-square values have increased from one block to another block.

In case of Industrial Relations and Labour the Geom distribution shows 197.2 and increasing 969.82. Poisson values during 2006 to 2008 block show comparatively less than the first block and last block.

10. Conclusion

The latest research trends show that they are more data intensive than earlier research due to the proliferation of digital technologies and the demand for solutions in today's era of fast paced innovation. Collaboration is working with each other to do a task. It is a process where two pr more people or organizations work together to realize shared goals. Most collaboration requires leadership. Although the form of leadership can be social within a decentralized group. In particular, teams that work collaboratively can obtain greater resources, recognition and reward when facing competition for finite resources. Studies show that there is increase in the third block period in all the parameter considered for the study

except probabilistic distribution of Management. The four and more authors contribution is more and by this it can be inferred that collaboration is in progressive trend. The investigation of such nature may be found useful in understanding the research and communication patterns of various disciplines, and hence would be helpful in planning more effective research and communication systems.

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Scientific Productivity of PES College of Engineering, Mandya : A study

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Abstract: An attempt has been made to identify the publications of PES college of Engineering, Mandya. This study is conducted to know the impact of publication of PES College in the scholarly word according to Web of Science. This paper analyses the articles and their citations covered in web of science and authorship pattern, and department wise distribution of papers. This study also provides an overview of knowledge dissemination in various forms.

Keywords: Web of science, Citation Analysis, PESCE

11. Review of literature

Publications analysis using citation indices will help to evaluate the performance and contributions of individual faculty or institution. It also elevates the institution standards among other institutions by showcasing intellectual property **(Kodandarama & Swamy D., 2016)** and keeping abreast of most impactful papers citation indices plays a great role **(Arshiya Kouser, 2016).**

12. Introduction to web of science

Web of Science is a single destination to access the most reliable, integrated, multidisciplinary research. Quality, curated content delivered alongside information on emerging trends, subject specific content and analysis tools make it easy for students, faculty, researchers, analysts, and program managers to pinpoint the most relevant research to inform their work.

Web of Science is described as a unifying research tool which enables the user to acquire, analyze, and disseminate database information in a timely manner. This is accomplished because of the creation of a common vocabulary, called ontology, for varied search terms and varied data. Moreover, search terms generate related information across categories. Acceptable content for Web of Knowledge

is determined by an evaluation and selection process based on the following criteria: impact, influence, timeliness, peer review, and geographic representation.

Web of Science employs various search and analysis capabilities. First, citation indexing is employed, which is enhanced by the capability to search for results across disciplines. The influence, impact, history, and methodology of an idea can be followed from its first instance, notice, or referral to the present day. This technology points to a deficiency with the keyword-only method of searching.

1. Coverage of web of science

Web of Science encompasses over 50,000 scholarly books, 12,000 journals and 160,000 conference proceedings from the year 1900 to the present The selection is made on the basis of impact evaluations and comprise open-access journals, spanning multiple academic disciplines. The coverage includes: the sciences, social sciences, arts, and humanities, and goes across disciplines. However, Web of Science does not index all journals, and its coverage in some fields is less complete than in others.

2. Introduction about PESCE Mandya.

P.E.S. College of Engineering, Mandya is one of the pioneer Engineering Colleges in India. Presently it is affiliated to the Visvesvaraya Technological University and is recognized by the All India Council of Technical Education, New Delhi. It is an institution functioning under the grant-in-aid scheme of Government of Karnataka. The College was established in the year 1962 by People's Education Society currently known as People's Education Trust (R), with the help of philanthropic farmers of Mandya District. The sole objective of the college was to promote Technical Education among the students of Rural Areas. The Society was founded by late Sri K.V. Shankaregowda, former Education Minister of Government of Karnataka with a missionary zeal and long cherished ambition to promote and disseminate knowledge, serving generally the cause of Education. Our college has got distinction of having research centers in all the Engineering Departments recognized by the Visvesvaraya Technological University, Belgaum and also has got a PET Research Foundation which is being recognized by University of Mysore.

Objectives

1. To find out the year wise publications covered by web of science

2. To find out the types of publications covered by web of science

3. To study the authorship pattern collaboration

4. To identify the PES faculty opted journals for the publications covered by web of science

Table 1. Types of publication

Sl. No	Types of Publication	No. of Publication	No. of Citation	H index
1.	Conference papers	79 (16.66%)	51	
2.	Journal Articles	35 (83.33%)	267	

The above table 3 shows different forms of cited documents which includes journal article, and proceedings paper the majority of the contributors preferred 35 journal article as the source of information to produce their research works which occupied the top position with the highest number of citations 267 (83.96%) followed by seven conference papers with 51 (14%) citations, It is found that the researchers preferred journal articles more frequently for their research work than any other types of communication Channels.

Table 2: Authorship Pattern

No of Authors	No of publication	Total of citations
One	1 (2.38%)	1
Two	9 (21.42%)	45
Three	19 (45.23%)	182
Four	11 (26.19%)	73
Five	2 (4.76%)	16

Table depicts the degree of authors collaborations, it is observed in the table that majority of 19 articles (45.23%) were found to be three-authored papers with 182 citations, followed by 11 (26.19%) four-authored with 72 citations, 9 (21.42%) two authored papers with 45 citations and 2 (4.76%) five authored with 16 citations. Hence, there

is a clear domination of collaboration contribution from faculty of PES. The degree of collaboration is found to be 97.61 %.

Table-3 Year wise distribution of Publications

Year	No of articles	No of citation
1990	1 (2.38%)	6
1996	1 (2.38%)	3
1997	5 (11.90%)	91
1998	3 (7.14%)	26
1999	--	--
2002	3 (7.14%)	35
2003	3 (7.14%)	26
2004	3 (7.14%)	22
2005	2 (4.76%)	15
2006	1 (2.38%)	11
2007	2 (4.76%)	14
2008	2 (4.76%)	10
2009	1 (2.38%)	11
2010	3 (7.14%)	17
2011	2 (4.76%)	16
2012	2 (4.76%)	6
2013	2 (4.76%)	9

Table 3 depicts the number of research publications of PESCE covered in web of Science for the period 1990-2016. The number of articles published per year has consistently witnessed an up-and-down trend during this period. The above table showed that the maximum numbers of 05 (11.90%) articles were covered in the year 1997 and minimum number of 01 (2.38%) article was covered in the years 1990, 1996, 2006 and 2009.

Table-4 Journals wise distribution of Publication (Top 15)

Name of the journals	Total Number of publications	No of citation
Engineering Failure Analysis	1	10
Environmental Modeling & Assessment	1	11
International Journal Of Acoustics And Vibration	1	7
International Journal Of Heat And Fluid Flow	1	17
International Journal Of Heat And Mass Transfer	2	15
International Journal Of Impact Engineering	1	13
Journal Of Environmental Science And Health Part B-Pesticides Food Contaminants And Agricultural Wastes	1	6
Journal Of Mathematical Imaging And Vision	1	6
Journal Of Physical Organic Chemistry	1	10
Journal Of Reinforced Plastics And Composites	1	12
Journal Of Tribology-Transactions Of The Asme	1	13
Machining Science And Technology	1	14
Tribology International	3	53
Tribology Transactions	1	10
Wear	2	81

Above table furnishes the top fifteen journals covering highest published papers of PES College of Engineering, Mandya. It is clear from the table that Machining Science and Technology has 3 papers published followed by International Journal of Heat and Mass Transfer and Wear with two papers each and rest of the journal carries one article each.

So it can be inferred that machining science and technology seem to be more preferred journal by scientist of PES College of Engineering, Mandya for having published majority of 3 papers

3. Results and findings

The study has identified some interesting facts from the analysis such as

1. The degree of collaboration is 45.23%. So, it can be inferred that majority of the scientists prefers to contribute their papers jointly.
2. 83.33 % publication of total items falls under the category of articles.
3. Web of Science covers less technical journals.

4. Conclusion

Few publications of PES have been covered in Web of Science as its coverage is less in the field of technical despite the production of more than thousands papers. Analyses of this sort of study may motivate faculty to publish their articles in high impact factor carrying journals.

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USAGE PATTERN OF NEWS PAPER SERVICE AMONG THE TEACHING COMMUNITY OF SBMJC LIBRARY, KGF.KARNATAKA

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Abstract: This study seeks to find out the newspapers subscribed by the SBMJC Llibrary and users preference in terms of language, writing style, editorials, attractive display, best contents etc. The study highlights the level of user's satisfaction with regard to availability of newspapers in the Library. The purpose of the study was to get users feedback about the newspaper service and to suggest remedial measures for making it more convenient and effective.

Keywords: Usage pattern, Mass media, Newspaper service, Print and online newspapers

1. INTRODUCTION

Newspapers are considered as an important source of information as they contain a broad range of news on all subjects and activities. Newspapers publish news articles on national, international as well as local news. The news includes Politics, Personalities, Business and Finance, Crime, Health and Medicine, Science and Technology, Sports and Entertainment and so on. It also includes Weather ,Criticism and reviews of arts (including literature, film, television, theater, fine arts and architecture) Obituaries, entertainment features such as Crosswords, horoscopes, editorials, cartoons, comic strips, advice, food and other columns, News paper is a a serial publication and usually printed on inexpensive, low-grade paper.

Mass media is a very important component of society and is referred to as the fourth pillar of democracy. In a developing country like India, it is considered very essential to mobilize people for development activities.

Newspapers helps to improve thinking and observation skills and promote imagination It plays

A major role in formulating and shaping public opinion. Newspapers play an important role in the dissemination of information and encourage reading habits, underscore the responsibilities of citizenship. Many printed newspapers have online editions available over the internet.

India has the largest newspapers market after China.

2. SBMJC,KGF

SBMJC as the 21st constituent in the JGI group was established in the year 2004 and till date has crossed several barriers effectively on its way to impart quality education with un disputable physical infrastructure and learning models. The institution completing its12th academic year is looking forward towards taking one more challenge to its stride in providing education with quality and styled to reach the mass with limited time and available resources. The SBMJC-KGF has a well establish library which caters to the need of thwe undergraduates and pre-university students and faculties. It has housed in spacious and attractive building. The Library Collection comprises of Books, Periodicals, CD-Rom, Question Bank, Project reports, Journals back volumes Cartographic materials.

3. OBJECTIVES OF THE STUDY

To explore the state of newspaper service at SBMJC-KGF Library

4. METHODOLOGY

The scope of the study was limited to teaching faculties of SBMJC KGF. Since the study is based on the library use, it involves collecting information from the user so the survey method was dopted and the questionnaires administer. 65 samples were considered. Out of which 34 are undergraduate faculties and 31 are Pre university faculties.

ANALYSIS

1. NEWS PAPER READING

FIG.1

86.15% of the faculties read the newspapers in the library.7.69% of the faculties read the newspapers at home & watch television for the current affairs

FREQUENCY OF READING NEWS PAPER

	DEGREE	PUC	TOTAL	%
DAILY	16	19	35	53.84
TWICE A WEEK	13	8	21	32.30
ONCE IN A WEEK	3	4	7	10.76
ONCE IN A MONTH				

Table.1

53.84% of the users read the newspapers daily, 32.30% of the faculties will read twice a week.

TIME SPENT FOR READING NEWSPAPERS

	TOTAL
0-10 MIN	11
10-20	22
20-30	13
30-40	12
50-60	7

Table.2

$x = \Sigma fm / N \quad 1515/65$

The Average Time Spent by the faculties is 23.30 min.

LANGUAGE PREFERRED

FIG.2

89.23% of the users prefer to read English Newspapers,38.46% of the faculties read Kannada Newspapers, where as 10.76% of the faculties read in their regional languages like Tamil, Telugu.

INTERESTING TOPICS IN NEWSPAPERS

1 ACADEMIC

2 POLITICS

3 SPORTS

4 ENTERTAINMENT &EDITORIAL

.....

10 CRIME

Interested topics in the newspapers are 1.Academics, 2.Politics, 3.Sports,4 Entertainment & Editorial, Crime will be their last choice.

6 BEST SUPPLIMENTARY

	DEGREE	PUC	TOTAL	%
TIMES OF INDIA	17	4	21	32.30
DECCAN HERALD	4	7	11	16.92
VIJAYA KARNATAKA	3		3	4.61
THE HINDU	3	3	6	9.23
PRAJAVANI		4	4	6.15

Table.3

32.30% of the users opinion is Times of India Supplement is the best, and 16.92% of the users second option is Deccan Herald. 9.23% of the user'schoices is The Hindu. In kannada 6.15% of the users likes the Prajavani

7 E-NEWSPAPERS

	DEGREE	PUC	TOTAL
YES	18	17	35
NO	11	11	22

Table.4

53% of the Faculties likes to read E-paper, they feel it is time saving & easy to use. Whereas 33.84% don't like to read E-Paper because it is not-convenient to read.

8 MOST PREFERRED NEWS PAPERS

	DEGREE	PUC	TOTAL	%
TIMES OF INDIA	25	15	40	61.53
DECCAN HERALD	20	16	36	55.38
THE HINDU	17	12	29	44.61
INDIAN EXPRESS	11	4	15	23.07
ECONOMIC TIMES	4	1	5	7.69
KANNADA PRABHA	6	4	10	15.38
PRAJAVANI	8	9	17	26.15
VIJAYA KARNATAKA	8	2	10	15.38
SOMYOUKTHA KARNATAKA	2	3	5	7.69
VIJAYA VANI		1	1	
UDAYAVANI	2	1	3	4.61
RAJASTHANI PATRIKA	1	1	2	3.07
DAKSHINA BHARATH	1	2	3	4.61
ENADU	2	2	4	6.15

SAKSHI	2	5	7	10.76
CRONICLE	1	6	7	10.76
TAMIL	1	4	5	7.69

Table.5

61.53% of the faculties first choice is Times of India,55.38% will read Deccan Herald,44.61% of the faculties choice is Hindu and 23.07% of the users read Indian Express.In Kannada 26.15% of the faculties read Prajavani, and 15.38% will read Vijayakarnataka and Kannada Prabha.

5. FINDINGS

1 72.30% of the respondents visit the library to read the newspapers, 60% of the faculties visit for the reference, 49.23% of the faculties will borrow the books and old question papers, 33.81% will use internet for the information and only 9.2% of the users borrow CD.

2 86.15% of the faculties read the newspapers in the library.

3 53.84% of the users read the newspapers daily, 32.30% of the faculties will read twice a week.

4 Average time spent by them is 23.30 minutes.

5 English is most preferred language,89.23% of the users prefer to read English Newspapers,38.46% of the faculties read Kannada Newspapers, where as 10.76% of the faculties read in their regional languages like Tamil, Telugu.

6 Interested topics in the newspapers are 1.Academics, 2.Politics, 3.Sports,4 Entertainment

& Editorial, Crime will be their last choice.

7 61.53% of the faculties first choice is Times of India,55.38% will read Deccan Herald,44.61% of the faculties choice is Hindu and 23.07% of the users read Indian Express.In Kannada 26.15% of the faculties read Prajavani, and 15.38% will read Vijayakarnataka and Kannada Prabha.

8 32.30% of the users opinion is Times of India Supplement is the best, and 16.92% of the users second option is Deccan Herald. The Hindu Will be their last option.

9 53% of the Faculties likes to read E-paper, they feel it is time saving & easy to use. Whereas 33.84% don't like to read E-Paper because it is not-convenient to read.

6. SUGGESTIONS

1. The library should make available multiple copies of daily/weekly newspapers in print which are popular and consulted for reading more by the users and should also ensure the timely availability of newspapers;

2. International newspapers in print should also be made available for reading in the library for users;

3. At present the newspapers are displayed in the library only. Newspapers should also be kept for display in some other section in the first/ second floor or in the separate room in a well organized manner; and

5. The library should ensure smooth and speedy internet facility for the instant access to online newspapers.

7. CONCLUSION

Newspapers contain current , up-to-date information. In libraries, newspaper display is one of the important services for providing the information at right time with convenience. Though the whole world are talking about e-newspapers, online newspapers but print formats are still in use by the readers. The reading of newspapers in print formats by readers has not diminished in libraries and information centers even in the face of availability of e-newspapers.

Library users read newspaper to get the latest information about what is happening around. Newspapers are essential for users but due to the enormous explosion of information published in the form of newspapers in different languages in particular, it is impossible for libraries to subscribe all that are published at the national and international levels. Under these circumstances the best way of serving the users is by proper display of newspapers and notifying users about new information related to education. In library there should be adequate newspapers to accelerate reading habits. This study helps librarians understand the importance of newspapers and improve the services related to newspapers

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Use of Academic Library and Students ' Academic outcome: A Case of College of Agriculture, Bheemrayangudi, Karnataka

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Abstract: This study is conducted to find out the correlation between library usage of College of Agriculture, Bheemrayangudi, Karnataka State, India and students academic achievement. The data was collected using questionnaire method and statistics related to circulation was collected from the automated library software system. Total of 70 students were taken for the study, they are in third year, first semester. The findings of the study indicate that there is a correlation between number of books borrowed and academic grade point of the students. Students who borrow more books they tend to do perform well in the examination. Parent educational qualification is correlated with student's academic grade point. Students whose father/Mother had degree/ technical degree tend to do better in the examination. Annual family income is not statistically correlated with student's academic performance. Based on the findings of the study further Authors recommend that, there is an urgent need for the improvement of library resources and services as they have positive impact over student's academic performance in Agriculture College in India.

Keywords: Use, Library, Agriculture College, Students, AGP, Information Resources, Services, Karnataka, India.

1. Introduction

The academic libraries are recognized as an integral part of the academic institutions, and also they strive to fulfill the objectives of the organization which is existed for, by offering library and information services. The libraries are facing the challenges to be relevant in the present era as the advancement in information technology occurred which made possible for speedy supply of information over network in different formats. The importance of academic

libraries in student's academic achievement is not new topic. Several studies have been conducted to find out the relationship between library usage and students' academic achievement[1-12]. As early as 1924, the American Library Association prepared a practical guideline and tool for libraries to evaluate their maintenance, administration, and service. The purpose of the study is to see the effects and importance of library and its resources over academic performance of degree level students at College of Agriculture, Bhimrayangudi, Karnataka, India. It would help policy makers of institutions to emphasize on such matter that have direct influence over quality of education.

2. Review of Literature

This study attempts to find out the correlation which existed between use of library and academic pursuit of the students, number of similar studies have been reported in past. A study conducted by Hiscock[4] investigated the relationship between the usage of libraries and academic performance. The study found that the students those who use library frequently showed a higher academic performance than those who did not or low use the library. Alharbi and Middleton[1] study found that only a minority of library users' educational achievement improves through library usage.

Whitmire[12] worked with academic library performance measures and the library usage of undergraduate students and their educational outcomes at 36 colleges and universities in the United States. Students engaging in more faculty interactions, active learning and writing activities showed a higher academic library use. Overall, the relationship between library usage and educational outcomes was shown to be weak. Kot and Jones[8] found that using a given library resource was associated with a small, but also meaningful, gain in first-term grade point average, net of other factors.

Jagar[6] found that students' library use significantly contributes to the students' success. Alharbi & Middleton[1] also conducted a study to find out relation between academic library usage and educationall performacne in Kuwait. They concluded that only minority of the library userseducational achievemnt improvs through library uasage. Brazier and Conroy[2] aimed to explore the relationship between library usage and the performance of undergraduate medical students. Tod and Kytömäki[9] Using the library for its material or for research purposes, as the learners group does, is the use that is most likely to have a direct connection to students' educational outcomes.

Goodall & Pattern[3] have made a study to discover the realtionship betwwen

academic library non/low use and undergraduate students acheivemnts. They found that in some subjects, students who read more, measuerd in borrowing books and electronic resources achieve better grads. Kot & Jones[8] made a study on impact of library resource utilization on undergradute students academic performance. They found that using a given library resurces was also associated with a samll, but also meaningful, gain in first-term grade point avarage, net of other factors. A similar study was conducted by Wong & Webb[12] to find out the correlation between students academic performance and library material usage at The Hong Kong Baptist University library and fond that the library was able to demonstrate its impact on students learning ourcomes. Students who borrow Library resources do outperform students who do not[10]requiring collaboration between among the library, university administration, Performance Indicator Project team (PIP. Students who borrowed most also performed best in their end-of-year examinations, and this association was only partly explained by regional differences[11]. Jager[5] One of the major goals of academic institutions has always been the education and qualification of students that conform to certain standards. Academic libraries in turn have aimed at the provision of resources that assist students in complying with these standards. This presentation suggests that with two different approaches to the correlation of use data with final grades obtained at a South African university, it was indeed possible to demonstrate practically that students' academic achievement may be positively associated with using the library. Jantti and Cox[7] Students those who borrowed books and used electronic resources were found to have higher grades than those who did not

3. Objectives of the study:

The main objectives of the study are:

- To discover use of information resources and services by students;
- To know the level of satisfaction with library resources and services; and
- To find out correlation between Academic Grade point of the students with circulation statistics of books and their parent educational qualification.

4. Methodology

The study is concerened with under garaduete studnets who are in third year first semester of B.Sc.(Agri.). Questionaire method is used for collect the data about stduents, i.e. scio-economic bacground and use of library at College of Agriculture,

Bheemrayanagudi, Karnataka, India. The questionnaire contains questions regarding academic grade point, parents educational qualifications, frequency visit to library, times spend during each visit and use and level satisfaction with information resources and services.. The students who are studying in third year and first semster B. Sc. (Agri.) were considered for the study. 70 students are selected for the study and from each student circulation realated information was extracted form library in-house, Library software and same were used for analysis and intereperation of the data. Pearsons correlation co-efficient is applied to test the wether students accademic grade point is correlated with parants educational qualification and circulation statistics.

5. Data Analysis and Interperation

College of Agriculture, Bheemarayangudi is one of the constitunet colleges of University of Agriculture Sciences, Raichur, Karntaka, India, established in the year 2001. At present the college is offering four years under graduate course in Agriculture and Two years Diploma in Agriculture. The college has good library with collection of 17000 voulmes, 46 national journals, e-resources like CeRA, indianjournals.com etc. and interent access to the stduents comunity.

Table 1. Gender wise student respondents

Gender	Respondents	Percent
Female	25	35.7
Male	45	64.3
Total	70	100.0

From the table-1 it's clear that majority (64.3%) of the male students are the respondents and only 35.7% of female students are the respondents for this study.

Table 2. Frequency of visit to Library

Frequency of visit	Respondents	Percent
Daily	8	11.4
Once in two days	32	45.7
At least once in a week	25	35.7
At least once in a month	2	2.9
Rarely	3	4.3
Total	70	100.0

It indicated in the table 2 that most of the students i.e 32 said, they are visiting the library once in two days (45.70%). And 25 students said that they visit the library at least once in a week i.e. 35.70%. But only 8 students visit the library daily (11.40%). And only 4.30% and 2.90% students visit the library rarely and at least once in a month respectively. It can be concluded from the table 2 that majority of the students visit at least once in a two days and once in a week.

Table 3. Time spend in the Library during each visit

Time spent in Library in Each visit	Respon-dents	Percent
30 minutes	7	10.0
An hours	34	48.6
Two hours	27	38.6
More than 2 hours	2	2.9
Total	70	100.0

From the table 3 it's observed that majority of the students spend minimum an hour time during their each visit to the library while, only 2.9 percent of the students opined that they spend minimum more than two hour time for their each visit. Only 10 percent of the users opined that they spend minimum 15 minutes time for their each visit. It can be concluded that majority of the students spend at least 1 to 2 hours time in their each visit in the library.

Table 4. Purpose of visit to the Library

Sl. No	**Purpose of visit**	Respondents	**Percent**
1	To read News paper and Magazines	61	87.1
2	To prepare for Competitive Exams	57	81.4
3	To consult reference re-sources	56	80.0
4	To borrow Books	55	78.6
5	For serious reading	53	75.7
6	To update general knowl-edge	52	74.3

7	To read text books	51	72.9
8	To browse Internet	47	67.1
9	To spend leisure time	6	8.6
10	To borrow Fiction	2	2.9
11	To meet Friends	1	1.4

From the table 4 its clear that majority of the students they visit library to read newspapers (87.1%), prepare for competative examiniations (81.4%), consult reference resources (80%), borrow books 78.6%), and 75.7% of the students for serous reading, 72.9% of the students to read text books while only few students vist library to spend leisure time (8.6%), borrow fiction (2.9%) and meet friends (1.4%).

Table 5. Use of Information Resources and Services

Use of Information Resources and Services	4	3	2	1	Total	Weighed Mean	Rank
Dictionary and Encyclopedia	**2**	**17**	**34**	**17**	**70**	**2.0**	**7**
	2.9%	24.3%	48.6%	24.3%	100%		
News papers	48	18	4	-	70	3.6	1
	68.6%	25.7%	5.7%	-	100%		
Journals and magazines	21	29	14	6	70	2.9	4
	30.0%	41.4%	20.0%	8.6%	100%		
Text Books	26	30	16	-	70	3.2	3
	37.1%	42.9%	22.8%	-	100%		
Web Based information resources	49	3	18	-	70	3.4	2
	70.0%	4.3%	25.7%	-	100%		

Books Lending service	18	25	22	5	70	2.8	5
	25.7%	35.7%	31.4%	7.1%	100%		
Reference Service	6	34	22	8	70	2.5	6
	8.6%	48.6%	31.4%	11.4%	100%		
Reading room facility	19	31	14	6	70	2.9	4
	27.1%	44.3%	20.0%	8.6%	100%		
Note: 4= Most frequently 3 =Frequently 2=Less frequently 1= Never							

From the table 5 its clear that most frequently used information resources are newspapers (68.6%), web based information resources (70%) and textbooks (37.1%) and Journals and magazines (41.4%) are used frequently. i.e. Less frequently used information resources are Dictionary and Encyclopedia (48.6%), book lending service (35.7%) and least used service is reference service i.e. 48.6%. This may be due to lack of awareness about reference service among the students. It can be concluded that majority of the students use newspapers web based information resources and textbooks, book lending service and reading room facility regularly.

Table 6. Level of satisfaction with Information Resources and Services

Use of Information resources and services	4	3	2	1	Total	Weighed Mean	Rank
Dictionary and Encyclopedia	6	39	17	8	70	2.6	6
	8.6%	55.7%	24.3%	11.4%	100%		
News papers	49	19	2	-	70	3.6	1
	70.0%	27.1%	2.9%	-	100%		
Journals and magazines	18	33	18	1	70	2.9	4
	25.7%	47.1%	25.7%	1.4%	100%		
Text Books	11	32	24	3	70	2.7	5

	15.7%	45.7%	34.3%	4.3%	100%		
Web Based information resources	43	5	22	-	70	3.3	2
	61.4%	7.1%	31.4%	-	100%		
Book Lending service	11	35	19	5	70	2.7	5
	15.7%	50.0%	27.1%	7.1%	100%		
Reference Service	9	31	25	5	70	2.6	6
	12.9%	44.3%	35.7%	7.1%	100%		
Reading room facility	17	40	8	5	70	3.0	3
	24.3%	57.1%	11.4%	7.1%	100%		
Note: 4= fully satisfied 3 =Satisfied 2=Less satisfied 1= Not satisfied							

Form the table 6, it's shows that students are very much satisfied with newspapers (70%) web based information resources (61.4%), and most of the students are just satisfied with reading room facility(57.1%), journals and magazines (47.1%), book lending service (50%) and reference service i.e. 44.3%. It can be concluded from the table 6 that there is very need to increase in library resources and services of the library.

Table 7. Correlations between books borrowed and AGP of the students

Correlations		AGP	Books barrowed
AGP	Pearson Correlation	1	.390**
	Sig. (2-tailed)		.001
	N	70	70
Books barrowed	Pearson Correlation	.390**	1
	Sig. (2-tailed)	.001	
	N	70	70
****. Correlation is significant at the 0.01 level (2-tailed).**			

From the table 7 it can be concluded that there is significant correlation between

number of books borrowed and academic grade point of the students under the study. Hence, it can be concluded that those students who borrow more books they tend to do perform well in the examination.

Table 8. Correlations between Mother's Educational Qualification and AGP of the students

Correlations		AGP	Mother Educational Qualification
AGP	Pearson Correlation	1	.572**
	Sig. (2-tailed)		.000
	N	70	70
Mother Educational Qualification	Pearson Correlation	.572**	1
	Sig. (2-tailed)	.000	
	N	70	70

****. Correlation is significant at the 0.01 level (2-tailed)**

From the above table 8, it cleared that there is a statisticlly significant correlation between mothers educational qualification and students AGP. Hence, it can be concluded that those students whose mother had degree/ technical degree tend to do better in the examination.

Table 9. Correlations between Father's Educational Qualification and AGP of the students

Correlations		AGP	Fathers Educational Qualification
AGP	Pearson Correlation	1	.519**
	Sig. (2-tailed)		.000
	N	70	70
Father Educational Qualification	Pearson Correlation	.519**	1
	Sig. (2-tailed)	.000	
	N	70	70

****. Correlation is significant at the 0.01 level (2-tailed).**

From the above table 9 it indicated that there is statisticlly significant correlation between Students Fathers educational qualification and AGP. Hence, it

can be concluded that those students whose father had degree/ technical degree tend to do better in the examination.

Table 10. Correlations between Family annual income and AGP of the students

Correlations		AGP	Family income
AGP	Pearson Correlation	1	.191
	Sig. (2-tailed)		.114
	N	70	70
Family income	Pearson Correlation	.191	1
	Sig. (2-tailed)	.114	
	N	70	70

Table 10 shows that the correlation between family income of the students and academic grade point positive but the correlation is not significant. Hence, the annual family income is not statistically correlated with student's academic performance.

6. Conclusion

The findings of the study indicate that majority of the students visit library once in two days or at least once in week, they usually spend at least an hour in the library. The main purpose of visit to prepare for competative examiniations, consult reference resources, borrow books and most used information resources are newspapers, web based information resources and textbooks and majority of the students are satisfied with newspapers, web based information resources, and reading room facility. Most of the students are just satisfied with journals and magazines, book lending service and reference service. Correlation between number of books borrowed and academic grade point of the students found statistically significant. Parent educational qualification is correlated with student's academic grade point. Hence, there is an urgent need for the improvement library resources and services as they have positive impact over student's academic

performance in Agriculture College Bheemarayanagudi.

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Use of Brainstorming method for improving the quality of services given by library of Smt. Putalaben shah college of education,Sangli.

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Abstract: The user studies provide empirical evidences for improving existing library services and planning new library services, so that using brainstorming stratrgy investigator try to find out the solutions on how to improve the quality of services provided by libray of Smt. Putalaben shah college of education,Sangli. Brainstorming is an useful strategy for librarians to find out solutions of any simple problems that they face.

Keywords: Brainstorming, affinity diagram, Services & Facilities, library staff.

1. Introduction:

Brainstorming is a group activity technique. The concept came forth in 1939.The term was popularized by Alex Faickney Osborn in his book 'Applied Imagination' in 1953.When we want to solve a simple problem with amazing and unique ideas then brainstorming is a best option. It is important to have a problem that is specific and can be made into a question.

Education college libraries play a vital role in achieving the parent institutional goal. To meet the information needs of teachers and student teacher, it becomes essential to find out the strengths and gaps of libraries to plan for improvements in the future. Using brainstorming strategy investigator try to find out the solutions on how to improve the quality of services provided by library of Smt. Putalaben shah college of education, Sangli.

2. Brainstorming Definition:

Brainstorming is a technique by which a group attempts to find a solution(s) to a specific problem by amassing ideas spontaneously (Osborn, 1953). It is a highly effective technique for maximizing group creative potential, not only to generate ideas but also to determine which ideas are most likely to succeed in a specific area of interest (Baumgartner, 2007).1.

Brainstorming is a commonly used tool by academics researchers and business teams.

3. Prodcedure:

1. Define the question or problem for brainstorming,
2. Create a group consisting of 5-12 people.
3. Instruct participants on how the session will be conducted.
4. Introduce the problem statement or question.
5. Give participants time to write their ideas.
6. Collect and read out all the written responses.
7. Record all ideas as they are shared.
8. Cluster and process the ideas.
9. Report back to participants on what has been done with their ideas.

4. Rules of Brainstorming:

The following criteria are essential to the idea-generation phase of a brainstorming session (Adams, 1979):

1. **There is no criticism, evaluation, judgment, or defense of ideas during the brainstorming session.** The purpose of brainstorming is to generate as many ideas related to the topic as possible in the time allowed. Evaluation, judgment, and selection of ideas are the purposes of subsequent session.
2. **Freewheeling and free association is encouraged.** Group members are asked to voice any solutions they can think of, no matter how outrageous or impractical they seem. There is no limit on "wild" or "far-fetched" ideas. Every idea is to be expressed. It is easier to tone down an idea and to select out later than it is to think up new and creative possibilities.
3. **Quantity is more desired than quality.** Group members are en-

couraged to contribute as many ideas as they think of. The greater the number of ideas generated, the more likely it is that there will be several useful ideas.

4. **Building on ideas is encouraged**. Combining, adding to, and "piggybacking" on ideas is part of the creative process. Members can suggest improvements, variations, or combinations of previous ideas.

Objective:

1. Identify the problems faced by the students related to library services.

2. Find out the solutions for improving the quality of services provided by library.

Assumption:

Less access of library by the students in Smt. Putalaben shah college of education,Sangli.

Hypothesis:

Students may suggest better solutions for improving the quality of services provided by library.

Scope and Limitations:

The study is focused on the access of library by the student teachers of Smt. Putalaben Shah College of education, Sangli. Out of 75 students 34 students was randomly selected for this study.

Significance:

Brainstorming session has been conducted to explore student's problems and expectations from the library services and student's perception has been kept in focus for the better perspective and dimensions.

Methodology:

For the present study the interpretative, evaluative and analytical methodology is used. Brainstorming strategy is used as a tool for the study. Investigator has been analyzed data by Affinity Diagram.

5. Procedure of the study:

To find out the solution on 'How to provide best services by library 'investigator was organized a brainstorming session on student teacher in Smt. Putalaben Shah college of education,Sangli.On 13.12.2016

For this session investigator has create a group. For this group out of 70 30 student teachers were randomly selected as a participants for brainstorming session. When the session was started investigator define the problem for the participants which she wants to solve, also cleared them the rules of Brainstorming processes.

She gave one hour time limit to participants and told them to write their own ideas as many as they can. When the processes of writing the ideas was finished. She told them to contribute their ideas.

One participant has been appointed to arrange the ideas on blackboard. During this, some participants have recollected some innovative ideas which prove very beneficial. While this discussion, group members started to indulge in awry track so the observer insists to focus on the main discussion.

Through this discussion many new ideas arise. Investigator encourages participants to think in a new way to collect innovative ideas. Through this process many better and beneficial ideas come to the surface. This session has been enjoyed by all participants.

Investigator accepted all the ideas came from participants. For evaluation Affinity diagram method is used. She sorted the ideas into separate groups, chose headers for each group. She wrote four headers on the board, under these headers she wrote related ideas consist of phrase or sentences or a single word.

6. Findings &Conclusion of the study:

From the above analysis of brainstorming following findings have been derived.

Student teacher suggested that for providing better services library should change their infrastructure, provide ICT based innovative services, library staff must have ICT knowledge and communication skill, library should be open in two shifts.

Understanding the user needs librarian should built digital library tools to help users in finding relevant information.

To meet the new searching habits of users on internet and full fill their demands

library should acquire more resources available in digital formats.

Library should acquire mobile technology, using this technology users can access the digital resources from anywhere and anytime.

Interaction with the users can be achieved due to advancement in mobile technology.

This service helps for marketing libraries products and services.

Library should offer free internet and Wi-Fi service.

To attract users, library should organize lectures on different subjects.

Library should organize competitions like, book review, essay writing, debating etc. which helps to enhance the reading habit of the users.

To provide ICT based services library staff should be computer literate.

To enhance their ICT knowledge ICT training must be given to library staff.

Library staff must have good communication skill. It helps to create library atmosphere healthy and user-friendly.

Brainstorming is a useful strategy for librarian's .It help librarians to find out solutions of the simple problems that they face.

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Use of Library Collection and Facilities of Nagarjuna College of Engineering and Technology Library, Devanahalli – A Study

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Abstract: The main objectives of the study are to know the use of library collection and facilities and seeking opinions of the users of the Nagarjuna College of Engineering and Technology, Devanahalli. The Study adopted a descriptive survey design and data was collected from the respondents using a questionnaire. The major findings of the study are majority of the respondents visit the daily, 90% of the respondents are satisfied with the present working hours of their library and co-operation of the staff is the most impressive aspect in the library.

Keywords: User survey; Library; Engineering students.

1. Introduction:

Library and information center caters to the information needs of students, faculty members and other staff. The institute has an up - to – date library, which

is completely automated. The area of central Library is about 2000 sqm with a seating capacity of 500. It has a collection of more than 40,000 volumes of books. Library has a spacious stock section, Reference section, personal study area and periodical section.

The Central Library has also established a Digital Library and E-Learning center; in these sections we can access on–line Journal, E-Books, Project reports (Soft Copies) DVD's of Technical magazines and Books and also we can access live classes of VTU syllabus subjects from various engineering colleges' subject experts through EDUSAT. It is sponsored by Visvesvaraya Technical University (VTU) Belgaum. We have more than 135 NPTEL video courses learning material and 125 Web courses which are developed by IIT and IISc., professors. Our college Library is a member of the DELNET – AICTE, CSI and CMTI. DELNET is also provides ILL (Inter Library Loan) facility to our college. Working hours of the library is 8:30 am

To 10:00 pm. In general holidays and Sundays from 9.00 am to 4.00 pm.

Any library is intended to meet the requirement of its user's community. The users of a Library will be able to expose their dissatisfaction or in adequate facilities in the library which will enable librarians to take necessary steps to improve the satisfaction of users. The users are best judges to measure the short coming in the existing library services. So that necessary measures can be undertaken for providing efficient and effective services to the users of the library.

2. Objectives:

The main objectives of the present study are:

1. To study objectives of the present study are.
2. To examine the satisfaction of users regarding present working hours of the library.
3. To know the difficulties in locating books/ periodicals in the library and the reasons for the same.
4. To know the opinion of the respondents on the arrangement of books/periodicals.

3. Methodology:

Students registered Engineering for various degree programs at Najarjuna College of Engineering and Technology, Devanahalli are selected by the investigator for the present study. It is limited to 3rd and final year students only.

Design of Questionnaire and collection of Data: The data was collected with the help of a structured questionnaire prepared in a very simple English language. Through a pilot study suggestions and modifications were received from the respondents.

The questionnaires were distributed to the respondents personally and were collected from them by giving sufficient time to fill up the same. Every effort was made by the investigator to get reliable data from the respondents.

Table -1 Frequency of visit to the Library.

Sl. No	Frequency of Visit	Total	Percentage
1	Daily	50	50
2	3-4 Times in a Week	40	40
3	Once in a Week	10	10
4	Occasionally	-------	------
	Total	100	

It can be observed from the above table that majority of the respondents visit the library daily (50%) followed by 3-4 times in a week (40 %) once in a Week (10%) and occasionally (0 %) It can be concluded that majority of the respondents visit the library daily.

Table - 2 Satisfaction of Working hours.

Sl. No	Opinion	Total	Percentage
1	YES	90	90%
2	NO	10	10%
	Total	100	100

The above table clearly shows that 90% of the respondents are satisfied with the present working hours of the library. Only 10% of the respondents responded negatively. It can be concluded that majority of the respondents are satisfied with the present working hours of their library.

Table - 3 Difficulty in locating books.

Sl. No	Opinion	Total	Percentage
1	YES	10	10%
2	NO	90	90%
	Total	100	100

The above table depicts that majority of the respondents (90%) opined that they have no difficulty in locating the books and the periodicals in the library. Only 10 % of the respondents feel difficulty in locating the books and periodicals in the library.

Table - 4 various reasons for feeling the difficulty in locating the books.

Sl. No	Reason	Total
1	Misplacement of books	12
2	Lack of proper Display	20
3	Lack of awareness of the arrangement	9
4	Non – Co operation of library staff	---

The above table clearly shows that the lack of proper display guides is the main reason for majority of the respondents are facing difficulties in location of the books in the library. The misplacement of books is another reason to face difficulty in location of books. Lack of awareness of arrangement of books is another reason to face difficulty in location of books. Lack of awareness of arrangement is also another significant reason for the students to face the difficulty in locating the books.

Table - 5 Opinion regarding arrangement of Books & Periodicals.

Sl. No	Opinion	Total	Percentage
1	Very good	90	90 %
2	Good	10	10 %
3	Fair	------	-------
4	Poor	--------	---------
	Total	100	100

The above table depicts that majority of the respondents (90 %) opined that the arrangement of books and periodicals are good .10 % of the respondents feel that the arrangement is very good. Interestingly no single respondents feel

that the arrangement is fair and poor.

Table - 6 Opinion regarding Library Collection.

Sl. No	Opinion	Total	Percentage
1	Adequate	39	39
2	Fair	50	50
3	Inadequate	11	11
4	Poor	------	------

The above table shows that majority of the respondents 50 % opined that the collection of the library is fair followed by 39 % of the respondents are opined that it is adequate. Only 11 % of the respondents feel the collection of the library is inadequate. It can be concluded that majority of the respondents opined that the collection is fair for their study.

Table - 7 Satisfaction regarding physical facility.

Sl. No	Physical facility	Satisfied	Not Satisfied
1	Drinking Water	100 (100 %)	00 (0%)
2	Furniture	90 (90 %)	10 (10%)
3	Lighting	92 (92 %)	8 (08%)
4	Ventilation	79 (79 %)	21 (21%)

The above table presents the satisfaction regarding the physical facilities. It is observed that all are satisfied with the drinking water facility in the library. 90 % of the respondents are satisfied with the furniture and 92 % are satisfied with the lighting in the library. 79 % of the respondents are satisfied with the ventilation in the library.

Table -8 Most Impressed Service of the Library.

Sl. No	Service/facility	Total	Percentage
1	Library collection	85	85
2	Reference Service	90	90
3	Circulation	87	87
4	Co-operation from the library staff	100	100

The table 8 indicates that co-operation of library staff is the most impressive service in the library and majority of the respondents 90 % opined that Reference Services is good in library, followed by 87 % of the respondents opined the circulation.

4. Findings:

- The major findings of the present study are
- Majority of the respondents (50%) visit the library daily
- Majority of the respondents are satisfied with the present working hours of the library
- Majority of the respondents (90%) are not facing any difficulty in locating the books and periodicals in the library.
- Lack of proper display guides is the major reason for difficulty in location of books
- Majority of the respondents (90%) are opined the arrangement of books/ periodicals is very good
- Majority of the respondents (50%) are opined that the library collection is fair for their requirement
- Majority of the respondents are not satisfied with the dirking facilities in the library
- Co- operation of library staff is the most impressive aspect in the library

5. Recommendations:

The following recommendations are suggested for better utilization of the Library

1. Arrange proper Display guides, by guides, bay guides, Library map will helpful to locate the books in the stack area

2. Purified and chilled drinking water should be provided near to the Library.

3. Proper Lighting facility needed for all corners of the Library, So that Lights are to be fitted where need.

6. Conclusion

The engineering college libraries are expected to provide user centric services and serve the users to understand the role in changing information environment. User orientation should be conducted to the students to educate them about the arrangement of books and periodicals in the library. The findings of this study may provide useful insight for the management to take necessary steps to strengthen the existing facilities and services to maximize the library use.

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Use of Library Resources and Service by Teaching Faculty and Students in Engineering and Medical Colleges in Bellary District- A Study.

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Abstract: This paper deals with Use of Library Resources and Services by Faculty and Students in Engineering and Medical Colleges in Bellary District. Use of Library Resouces and Information Services are two important interrelated functions that facilitate the provision of the right information to the right user at the right time. Future for libraries therefore lies in a policy of access rather than ownership, as most material will be in electronic form in future and due to economic grounds. For the time being, perhaps it can be on-the-spot access to current materials and remote access to older material leading to the concepts of core collection and core access. In this context of Library and Information Services (LIS), the library/information center should provide appropriate services geared to the different requirements of different user groups' students, teachers, researchers, etc in the college libraries.

Keywords: Library Resources, Services, Information Technology, College Libraries, Searching Techniques.

1. Introduction:

Use of Library Resources and Information Services are two important interrelated functions that facilitate the provision of the right information to the right user at the right time and thereby conformance to the five laws of Library Science is ensured. However, collection or Information Sources Development should be based on sound policies and programs. Therefore, there is a need for the formulation of Collection Development Policy which takes in to consideration factors, such as users and their informational requirements, subject boundaries to be covered by the information sources, Documentary and Non-documentary sources to be covered, priorities and limitations, if any, methods of procurement, type of materials if any, governing the selection like; forms of materials to be collected or excluded, languages and geographical areas to be covered, chronological period to be covered or excluded, extent of duplication of materials, if any, methods of procurement, type of collection agreements that can be considered at local, regional, national or international levels. Nevertheless, technology is changing how we collect, store and access materials. Future for libraries therefore lies in a policy of access rather than ownership, as most material will be in electronic form in future and due to economic grounds. For the time being, perhaps it can

be on-the-spot access to current materials and remote access to older material leading to the concepts of core collection and core access. Of course, the problem of integration of electronic resources with traditional forms needs to be addressed by the profession.

2. Use of Services:

The Cascade of information sources and information explosion requires the libraries to play increasingly significant role in evaluating resources and educating the user. New skills and approaches are required for assessing the user's specific requirements. Satisfaction with the existing services would not promote the standards and quality of information services. Hence continuous user promotion and information literacy programs have to be launched with novel ideas to enhance the use of services. Besides the traditional user education and feed back of the users, there are a few user education and use measurement practices which are essential for academic libraries.

3. The major priorities in information services:

For a better and qualitative information service the academic libraries need to play significant role. They have to build the users' trust in the academic library services and to get them to use the services to capture information once, and then to share it across all relevant services to make information widely available, and to provide equal access to all.

They need to ensure that they follow guidelines on accessibility, usability and design produced by the national and by international standards. They have to achieve consistency in information provision, e.g. by establishing a common look and feel across academic libraries.

1. The following practices are crucial in academic information services in enhancing the use.
2. To provide the wide access to information in a multiplicity of ways, e.g. to accommodate both the naïve and experienced user; e.g. to accommodate both the need for a quick, simple, targeted answer and the need for an exploration of detailed information and publications so users can become knowledgeable and empowered to engage with academic activities
3. To provide a range of information tools to access so users can choose to the available options.
4. To ensure that providing specific user groups with controlled views of in-

formation on required topics (which enables the institution to target information, and the user to obtain information easily) does not result in the users being prevented from finding other information that they determine they want.

4. Need for the Study

The Colleges are inevitably intellectual arenas and a place for the cross-fertilization of ideas serving as a platform, where the bounds of knowledge are being perpetually extended and these College libraries are established, and maintained and administered by a university to meet the exclusive needs of its students, members of the academic staff. In order to run the show of the College libraries, the adequacy of library staff equipped with skills are the basic requirements for the library along with proper timing, for easy access to the library customers.

5. Objectives of the Study

The broad objectives of the study are to determine the "Use of Library Resources and Services by Teaching Faculty and Students of Engineering and Medical College Libraries in Bellary District". The specific objectives of the study are based on response of Engineering and Medical College Libraries in Bellary District.

- To examine the collection development of information resources both print as well as electronic resources in Engineering and Medical College Libraries in Bellary District, Karnataka, India.
- To understand the tools adopted in organizing various information resources
- To know the availability of existing manpower, building and technological infrastructural facilities
- To identify the current status of Library Automation in university libraries
- To understand the various information services including IT based services extended to the users

- To identify the methods adopted for preservation, storage and weeding and stock verification policy of Engineering and Medical College Libraries in Bellary District.
- To know the problems faced in using library resources, facilities and services.
- To understand the use of Library Resources (print and Internet sources) by teaching faculty and Students particularly to identify the
- Motivational factors for using library resources
- Frequency of using library resources
- Usefulness and importance of library resources to support academic and research activities and
- To determine the frequency of using library facilities and services in the libraries
- To understand the level of satisfaction towards of library facilities and services offered to the users
- To determine the method(s) adopted for searching information sources both print and Internet sources and.
- To know the problems faced in using library resources, facilities and services.

6. Research Methodology

Research methodology involves starting from general questions, narrowing down to focus on one specific aspect, and designing research to observe and analyze the results of the study, summarize findings, suggest the measures to overcome the research gap and future guidelines for the forthcoming researchers.

7. Concepts used in the Study

▪ Information

Information is the refined form of data that has been verified to be accurate and timely, is specific and organized for a purpose, is presented within a con-

text that gives it meaning and relevance, and that can lead to an increase in understanding and decrease in uncertainty. It is the information that supports educational and research activities of the user's community in an academic environment.

- **Library Resources**

Library Resources are the sources that help users to meet their educational and research needs.These information Sources are the means to information whereas resources include sources which are broader in nature that includes sources. In the study information resources includes Books, Scientific journals/ Periodicals, Conference/seminars proceedings, Thesis and Dissertations, Reference sources, Indexing and Abstracting Sources, catalogues and online sources etc.

- **Facilities**

Library facilities to support learning, teaching and research activities for the students, research scholars and teaching community that includes facilities like Reading Room, Reprography or Xerox facility, Printing facility, Internet facility, Network facility, drinking water, aesthetic conditions of library buildings etc

- **Services**

Library services are the means to serve users by rendering active or passive services that includes Circulation Service, Reference Service, Bibliographic Service, Current Content/Title Alert Service, Newspaper clipping service, Index and abstracting service, Inter-Library Loan/ Document Delivery, Internet based services etc.

8. Research Methodology and Design:

This study used questionnaire survey method. The questionnaires were personally distributed to the faculty members and students of Engineering and

Medical College Libraries. This study was conducted during the year 2015. A random sample of 494 students and 304 for faculties selected. The questionnaires were distributed to the faculties and students who were present in library and staff rooms.

9. Data Analysis:

An attempt has been made to analyze the research data collected from faculty members of Engineering and Medical College Libraries in Bellary Districts and interpret the results revealing their use of library resources and information sources to the library managers and planners in designing and developing a suitable strategy in promoting the better use of valuable information sources including electronic format and thus justifying the cost effectiveness of library efforts.

Frequency of visit to the Library:

Academic Colleges serve as research centers where knowledge is discovered, intellectuals are bred, scientific manpower is produced and technical know-how is developed and serve as a research centre of excellence. For this, library is a integral part of College education to support teaching and research activities.

Table-1 Time spent on Reading Library resources per day

Time spent on Reading	Frequency	Percent
1-2 hours	386	48.4
3-4 hours	315	39.5
5-6 hours	81	10.2
7-8 hours	3	0.4
9-10 hours	3	0.4
10 & above	10	1.3
Total	798	100:0

48.4% of respondents indicated that they spend 1-2 hours on reading and 39.5% spend 3-4 hours per day. Only 10.2% of respondents spend 5 to 6 hours on reading information Sources per day. The number of respondents spending their time on teaching information Sources for more than six hours is found to be very negligible. Thus less than half of the respondents spend only one to two hours on

reading various information sources.

Purpose of Visiting the Library:

Library should be viewed as an integral part and parcel of every user to encourage, motivate and support not only learning and teaching but also develop ideal citizens of the country. Thus, the purpose of visiting the library is equally important for optimization of respondents knowledge to support their educational endeavor. Table 3 shows that the purpose of seeking information by the respondents of the study.

Table-2 Purpose of visiting the Library:

Purpose of visiting the Library	Frequency	Percentage
For research work	640	80.2
To update knowledge	695	87.1
For self-improvement	455	57.0
To consult reference sources	331	41.5
To Use CD-ROM database	141	17.7
Preparing class notes	487	61.0
Writing research paper	555	69.5
To borrow books	434	54.4
To Use Internet	279	35.0

The main purpose of visiting the library by respondents are to update knowledge (87.1%), followed by to attend their research work (80.2%), writing research paper (69.5%) and to prepare class notes (61%). More than half of the respondents indicated that the main purpose of visiting the library is for self-improvements (57%) and to borrow books (54%). However 41.5% of the respondents do visit the library for consulting reference sources. Slightly more than one third of respondents are found to visit the library to use the Internet facilities and only 17.7% of respondents visit the library for accessing CD ROM Databases (Table 5.8).

Table-3 Importance and usefulness of Library resources to support academic and Student activities

Library Resources	Extremely Important		Quite Important		Somewhat Important		Not Very Important		Can't say	
	Number	%	Number	%	Number	%	Number	%	Number	%
Books	664	83.2	115	14.4	17	2.1	2	0.3		
Scientific journals/ Periodicals	497	62.3	277	34.7	17	2.1	5	0.6	2	0.3
Conference/seminars proceedings	280	35.1	297	37.2	196	24.6	21	2.6	4	0.5
Thesis and Dissertations	351	44.0	228	28.6	195	24.4	19	2.4	5	0.6
Reference sources (Dictionaries, Encyclopedia etc.)	248	31.1	334	41.9	196	24.6	15	1.9	5	0.6
Indexing and Abstracting Sources	143	17.9	359	45.0	208	26.1	80	10.0	8	1.0
Library catalogue (OPAC)/ Union Catalogue	196	24.6	321	40.2	148	18.5	103	12.9	30	3.8
Newspapers and Magazines	259	32.5	306	38.3	194	24.3	27	3.4	12	1.5
Internet based e-journals, Databases & Archives	420	52.6	216	27.1	121	15.2	18	2.3	23	2.9
CD-ROM educational databases	174	21.8	359	45.0	148	18.5	85	10.7	32	4.0
Consulting a knowledgeable person/ experts in field/ supervisor	304	38.1	308	38.6	158	19.8	13	1.6	15	1.9
Discussion with librarian or staff of the library	148	18.5	239	29.9	236	29.6	76	9.5	99	12.4

The respondents consider Books (83.2%, N=664), Scientific Journals (62.3%, N=497) and then Internet based e-journals, Databases and archives (52.6%, N=420 as extremely important sources of Library Resources to support their academic and research activities as compared to other types of Library Resources. Followed to these Library Resources, the respondent under study consider thesis and dissertations (44%), knowledgeable person expert (38%), conference proceedings (35%), newspapers& Magazines (32.5%) and reference sources (31.1%) as extremely important and useful sources of information. On the other hand less than one fifth of respondents have considered the Library Resources

as extremely important particularly CD-ROM educational databases (21.8%) and discussion with library staff (18.5%). Thus books and journals have been rated as extremely important source of information by the respondents to support academic and research activities in a College environment.

Use of Technologies in Libraries:

Information Revolution has made libraries around the world to adopt new philosophies and technologies for information dissemination and also reduce the cost of information. Maintaining the depths of collection of a single greatest challenge confronting libraries, be it, academic, special, national or public libraries have realized that although they are well funded, it is difficult to acquire all the materials needed by the clientele.

Table-4 Use of Internet based sources and services

Internet sources & services	To greater extent (5)		To Full extent (4)		To some extent (3)		To Little extent (2)		Not at All (1)	
	Number	%	Number	%	Number	%	Number	%	Number	%
E-mail	414	51.9	193	24.2	150	18.8	39	4.9	2	0.3
WWW	385	48.2	201	25.2	173	21.7	35	4.4	4	0.5
E-Journals and Databases	275	34.5	217	27.2	185	23.2	83	10.4	38	4.8
Web OPAC's	138	17.3	148	18.5	337	42.2	102	12.8	73	9.1
Discussion Forums	131	16.4	156	19.5	302	37.8	104	13.0	105	13.2
FTP/ Telnet	69	8.6	100	12.5	155	19.4	201	25.2	273	34.2
Search Engines	389	48.7	154	19.3	90	11.3	79	9.9	86	10.8
Subject Gateways	128	16.0	245	30.7	219	27.4	124	15.5	82	10.3

It is clear from table 5.13 that E-mail has been used to a greater extent by 51.9% of respondents and so also 48.2% use WWW and 48.7% use search engines to a greater extent. However, web OPACs and discussion forums are less used and 34.2% do not use FTP/Telnet services. Thus e-mail and World Wide Web are the two popular internet based sources which are used to a greater extent.

Table -5 Searching Methods: Books

Searching Methods	Frequency	Percentage
Library Catalogue	413	51.7
OPAC	290	36.3
Directly browsing shelf/racks	518	64.9
Seeking help by library staff	447	56

Table 7 find that 51.7% of the users access the Library catalogue, 36.3% of the users were used OPAC System, 64.9% of the users were directly browsing shelf/ raks and 56% of the users seeking help by library staff.

Table-6 Searching Methods: Journals

Searching Methods	Frequency	Percentage
Library Kardex	224	28.1
Directly browsing shelf/racks	654	82.0
Seeking help by library staff	358	44.9

Table 8 find that directly browsing shelf/racks have been the popular method of searching Books (64.9%) and Journals (82%) when compared to other methods of searching either through library catalogue/ kardex or seeking help from library staff.

Table-7 Searching Methods: Internet

Searching Methods	Frequency	Percentage
Using search engines	468	58.6
Directly typing web site address	433	54.3
Help by library staff	229	28.7
Keyword searching	415	52.0

Table 9 find that 30.5% of respondents reveal that circulation service is very frequently used service and 42.6% indicate using circulation service frequently. More than half of the respondents use reference service frequently (53.6%). More than forty percent of the respondents have indicated to use bibliographic service (42.4%) and newspaper clipping service (44.2%) quite frequently so also Internet

based services are found to be used frequently by the respondents under study (32.7%).

10. Summary of Finding:

The significant findings of the study are given below:

- All the respondents are in the habit of using library and more than half of them visit library every day and one-fifth visits the library every alternate day and a very negligible portion does not use the library and they are having their personal book collection.
- The observation of all respondents female is the maximum respondents.
- The age group of respondents is maximum of the users belongs to above 20 to 30 years.
- The main purpose of visiting the library is to keep up to date, to collect course materials, preparation for teaching and followed by general updates and project work.
- Educational information is the pre-dominantly used information need for the respondents useful for their academic and teaching activities followed by employment and job related information.
- Almost all the respondents use internet technology for their academic and teaching activity and general knowledge.
- The main purpose of the using internet is for collection of course materials, general knowledge and work of projects than for mailing.
- Browsing websites and search engines are the most preferred methods for findings information on the internet.
- E-reference books and e-journals are the types of electronic information sources browsed on the internet by the respondents.
- Majority of the respondents are of the opinion that information resources in the college library are adequately stocked.

13. Suggestions

Keeping in view the results of this study the following viable suggestions are made. It would be appropriate to consider the suggestions for adoption and implementation.

- A majority of respondents visit the library with the study/research purpose to update knowledge, prepare class notes/ write research paper and to borrow books. However, the most of the users are not well aware about bibliographies, indexing and abstracting sources, CD-ROM databases. Thus it is being suggested that proper orientation / education should be provided to the users so that they remain fully aware of the latest subscribed sources in the library.
- Less than half of the respondents under study spend one to two hours per day for reading and as such reading habits is found to be diminishing. Hence it is the equal responsibilities among teaching faculty and particularly librarians to attract the users to promote reading habits and make them to spend more for reading and learning activities.
- The results found that majority of the respondents consider only Books and Scientific journals/ periodicals and then Internet are the important and useful sources of information to support academic and research activities.
- About half of the respondents indicated satisfaction to some extent towards information sources available in the library particularly books. This calls for quality of collections and need for improved need based collections of information sources and the need for promotional methods to be adopted by library staff.
- Although Internet has been fairly used by respondents but its optimization of various services like e-journals, FTP/Telnet, web OPACs and subject gateways have to be used. Hence specialized user sensitization programmes have to be introduced for the benefit of academic and research community.

- Innovation skills among Library staff as opined by respondent's calls for more pragmatic approach and develop service orientated approach by making them available at service points.
- Specialized searching skills training is essential based on the results of the study, as the respondents prefer to browse directly to the shelves/ racks rather than library catalogue. There is a need to train the users for making use of catalogue/ OPAC, use of indexes, content pages and Boolean operators so that right information is met.
- Library services particularly current awareness services, bibliographic, inter-library loan, Internet and CD-ROM services have to be strengthened in the interest of user community.
- It is observed that the respondent college libraries do not have exclusive facilities for research scholars. Except Reading room, Reprography, printing and network facilities have to be strengthened by the library and improve the library facilities. The study recommends the provision of comfortable physical environment by separate reading space and seating facility for research scholars. Provision of facilities like separate rest room, internet enabled computers and printers with trained staff to assist the researchers and the creation of a separate section called "Research Guidance Section" with qualified staff.

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USE PATTERN OF INFORMATION SOURCES BY SCHOOL CHILDREN IN A SCHOOL ENVIRONMENT: A CASE STUDY OF VIJAYAPURA DISTRICT, KARNATAKA.

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Abstract: The purpose of this study is to find out the level of use of information sources by school children in Vijayapura District. Information is crucial to the learning process and students explore various sources to meet their information needs. The survey reveals that the maximum number of school children uses text books for getting their required information. Journals, Magazines, Encyclopedia, Dictionaries, and Educational materials etc., are very less used by students. Patents, Reports, Standards/Specifications and Archives are never used by a majority of school children. The study concludes that there is a need for educating these school children in the use of information sources.

Keywords: *Information sources, Use pattern, School children, School environment, Vijayapura District.*

1. INTRODUCTION:

Information is regarded as a critical resource, ranking just after air, water, food, and shelter. People need information for making decisions. They may acquire information through the research process, which is the process of finding ideas, facts, and new information by systematic study. The new facts and ideas will be based on existing ones, which are found in the existing literature (Reddy, Shankar). Information is a basic resource and an integral part of human activity. It plays a important role in the overall development of a country. It is available in different formats Print, non-print and electronic and in different categories Primary, Secondary and Tertiary and in different channels- Formal and Informal. Though all these are important for users of information, only a few of them are needed frequently, depending on such factors as work

activity, discipline and availability of facilities.

An information source is a source of information for somebody, i.e. anything that might inform a person about something or provide knowledge about it. Different types of questions require different sources of information. Information sources may be observations, people, speeches, documents, pictures, organizations, websites, etc (Tadasad, P. G). The present study looks at the use pattern of information sources by secondary school children at Vijayapura District.

2. REVIEW OF LITERATURE:

A Literature search made on LISA, LISTA, Emeraldinsight.com, indicates that number of studies in the recent past were carried out to find out the use of information sources among school children. Some of the surveys in the context of students are reviewed here.

Madden, Andrew. D (2007) describes the information resources used by children at an English secondary school. The purpose of this research is to study the information-seeking habits of children at an English secondary school. Large, Andrew (2008) analyzes the children as information seekers: what researchers tell us. Children and adolescents seek information both to support their school-based learning activities and their leisure activities. This article discusses their information-seeking behavior when confronting both electronic and print sources. Nwezeh, Chinwe M. T (2008) describes a survey of Information Sources Used by Secondary School Students in Ife Central and Ife East Local Government areas of Osun State, Nigeria for knowledge and attitudes towards HIV/AIDS. Onuoha, Uloma. Doris (2013) observed that the awareness and use of career information sources among secondary school students in selected schools in Ikenne local government area of Ogun State, Nigeria. The purpose of this paper was to investigate the awareness and use of career information sources among secondary school students. Deepa Kulkarni and Tadasad, 2015; The study reveals the awareness and use of internet based E-Information resources in school children. Based on a survey of 120 students, the study emphasizes the awareness and use E-Information resources. It accesses and analyses the acquaintance of school children

with IT awareness and use of internet sources in the library.

The review of literature confirms that there is a dearth for such studies in the school environment as no studies have been reported in the Indian context in school environment.

3. OBJECTIVES OF THE STUDY:

1. To study the use of information sources by school children.
2. To know the various methods used for gathering the information sources.
3. To know the purpose of use information sources.
4. To analyze the problems faced while using the information sources.

4. METHODOLOGY:

In order to find out the use pattern of information sources among the school children in a school environment, the survey method has been followed for the collection of data required. A questionnaire was designed keeping in view the objectives of the study and it was distributed of one thousand and fifty school children in Vijayapura District. In all one thousand and fifty questionnaires have been received with a response rate of 100%.

5. ANALYSIS AND INTERPRETATION OF DATA:

Based on the data collected from 1050 respondents an attempt has been made to analyze and interpret the data in terms of awareness and use of information sources among school children.

It follows from Table-1 that the study population consists of students belonging to various social classes, studying in IX and X class. The present study reveals that half of the student communities are studying in X class (53.3%), female (53%), OBC category (42.2%), urban area (61.1%) and also it follows that (73.5%) students are studying in

Kannada medium, (66.1%) father are literate and (58.8%) mothers are literate.

Table-1: Characteristics of Study Population:

Characteristics	No of Respondents	Percentage
Class		
IX class	490	46.7
X class	560	53.3
Taluka		
Basavan Bagewadi	150	14.3
Bijapur Rural	150	14.3
Bijapur Urban	150	14.3
Indi	150	14.3
Muddebihal	150	14.3
Sindagi	150	14.3
Chadachan	150	14.3
Gender		
Male	493	47.0
Female	557	53.0
Category		
GM	379	36.1
OBC	443	42.2
SC/ST	228	21.7
Domicile		
Rural	408	38.9
Urban	642	61.1
Medium of Instruction		
Kannada	772	73.5
English	278	26.5
Education of Father		
Illiterate	105	10.0
Literate	694	66.1
Degree	251	23.9
Education of Mother		
Illiterate	239	22.8
Literate	617	58.8
Degree	194	18.5

6. USE OF INFORMATION SOURCES:

Use of information sources by school children of Vijayapura District, is shown in Table-2. It is found that books (73.7%) are highly frequently used; class notes are also used highly frequently (92.0%), (84.66%) are some of the important, guides and yearbooks are not at all used i.e., (95.8%), non book materials (48.0%) are sometimes used by the children. Hence this table concludes that majority of the school children given the most importance to use of textbooks that is the mean value of 16.3610.

Table-2: Use of Information Sources by School Children (N=1050)

Sources	Highly frequently used	Very frequently used	Frequently used	Some times	Not at all	Mean	Rank
Text books	774 (73.71)	233 (22.19)	43 (4.09)	00 (0.00)	00 (0.00)	16.3610	1
Class notes	967 (92.09)	50 (4.76)	33 (3.14)	00 (0.00)	00 (0.00)	4.6962	3
Dictionaries	00 (0.00)	29 (2.76)	106 (10.09)	889 (84.66)	26 (2.47)	4.8895	2
Directories	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	2.1314	4
Encyclopedias	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	1.0000	7
Guides/Yearbooks	00 (0.00)	00 (0.00)	00 (0.00)	44 (4.19)	1006 (95.80)	1.0419	6
Noon book materials	00 (0.00)	00 (0.00)	64 (6.09)	504 (48.0)	482 (45.90)	1.6019	5

7. USE OF INFORMATION SOURCES VS PERSONAL ATTRIBUTES OF SCHOOL CHILDREN:

The use pattern of information sources among the school children in a school environment was further statistically put to test to determine whether the personal attributes like class, gender, and domicile have any bearing on the use of information sources.

7.1: Awareness of Information Sources to Gather the Information:

Table No-7.1.A: Awareness of information sources Vs Class in which school children were studying (N=1050)

Information Sources/ Aware	Class		Total
	IX (N=490)	X (N=560)	
Books	490 (100.0)	560 (100.0)	1050 (100.0)
Journals	24 (4.9)	37 (6.6)	61 (5.8)
Magazines	291 (59.4)	324 (57.9)	615 (58.6)
Encyclopedia	2 (0.4)	4 (0.7)	6 (0.6)
Dictionaries	440 (89.8)	504 (90.0)	944 (89.9)
Internet	467 (95.3)	560 (100.0)	1027 (97.8)
Newspaper	396 (80.8)	461 (82.3)	857 (81.6)
Audio/Video material	368 (75.1)	416 (74.3)	784 (74.7)
CD-ROM databases	21 (4.3)	25 (4.5)	46 (4.4)
DVD	260 (53.1)	310 (55.4)	570 (54.3)
Online databases	17 (3.5)	12 (2.1)	29 (2.8)
Educational materials	490 (100.0)	560 (100.0)	1050 (100.0)
Class room lecture	490 (100.0)	560 (100.0)	1050 (100.0)
Radio	490 (100.0)	516 (92.1)	1006 (95.8)
Television	315 (64.3)	560 (100.0)	875 (83.3)
Discussion with teacher	450 (91.8)	560 (100.0)	1010 (96.2)
Discussion with friends	490 (100.0)	398 (71.1)	888 (84.6)
Parents	490 (100.0)	560 (100.0)	1050 (100.0)
Neighbors	450 (91.8)	499 (89.1)	949 (90.4)
Training programmes	40 (8.2)	41 (7.3)	81 (7.7)
$X^2 = 74.09466$ df = 19 $\alpha = 0.05$ $X^2_{(t)} = 30.144$ Remark= Significant			

(Note: Figures in the parentheses indicate the percentages)

Different types of information sources are usually required by the school children. These include formal and informal sources. The school children under study were asked to indicate their awareness about formal and informal sources including books, magazines, journals, encyclopedia, dictionaries, newspapers, internet, CD-ROM databases, audio-video material, DVD, online databases, educational materials, classroom lectures, radio, television, discussion with teacher, discussion with friends, parents, neighbor and training programmes.

From Table-7.1.A it is found that every school child is aware of books,

educational materials, radio, television, teacher, friends, parents and class room lectures as sources of information. A very large majority of school children were also aware of internet (93.6%, N=938), neighbors (90.4%, N=949), dictionaries (89.9%, N=944) and newspapers (81.6%, N=857) as information sources. Nearly three fourth of school children (74.7%, N=784) were aware of a-v materials and more than half were aware of DVDs (54.3%, N= 570) and magazines (58.6%, N=615). A small number of school children were aware of information sources like scientific journals (5.8%, N=61), encyclopedias (0.6%, N=6), CD ROM databases (4.4%, N=46), online databases (2.8%, N=29) and training programmes (7.7%, N=81).

Hypothesis Testing:

H_0- There is no association between awareness about information sources and class in which school children were studying.

H_1-There is an association between awareness about information sources and class in which school children were studying.

Since the calculated Chi-square value is (74.09466) more than the table value (30.144), the null hypotheses (H_0) is rejected and the alternative hypotheses (H_1) is accepted. Hence, it can be concluded that there is an association between awareness about information sources and class in which school children were studying. From table-7.1.A it can be found that children studying in class IX have better awareness of magazines, audio-visual materials, radio, discussion with friends and neighbors. Children of class X have better awareness of journals, dictionaries, internet, newspapers, television and discussion with teachers.

Table No-7.1.B: Awareness of information sources to gather information Vs Gender (N=1050)

Information Sources/ Aware	Gender		Total
	Boys (N=493)	Girls (N=557)	
Books	493 (100.0)	557 (100.0)	1050(100.0)
Journals	24 (4.9)	37 (6.6)	61 (5.8)
Magazines	315 (63.9)	300 (53.9)	615 (58.6)
Encyclopedia	3 (0.6)	3 (0.5)	6 (0.6)

Dictionaries	445 (90.3)	499 (89.6)	944 (89.9)
Internet	461 (93.5)	522 (93.7)	983 (93.6)
Newspaper	408 (82.8)	449 (80.6)	857 (81.6)
Audio/Video material	368 (74.6)	416 (74.7)	784 (74.7)
CD-ROM databases	28 (5.7)	18 (3.2)	46 (4.4)
DVD	275 (55.8)	295 (53.0)	570 (54.3)
Online databases	10 (2.0)	19 (3.4)	29 (2.8)
Educational materials	493 (100.0)	557 (100.0)	1050(100.0)
Class room lecture	493 (100.0)	557 (100.0)	1050(100.0)
Radio	493 (100.0)	557 (100.0)	1050(100.0)
Television	493 (100.0)	557 (100.0)	1050(100.0)
Discussion with teacher	493 (100.0)	557 (100.0)	1050(100.0)
Discussion with friends	493 (100.0)	557 (100.0)	1050(100.0)
Parents	493 (100.0)	557 (100.0)	1050(100.0)
Neighbors	455 (92.3)	494 (88.7)	949 (90.4)
Training programmes	29 (5.9)	52 (9.3)	81 (7.7)
X^2 = 15.84934 df = 19 α= 0.05 $X^2_{(t)}$ = 30.144 Remark= Non- Significant			

(Note: Figures in the parentheses indicate the percentages)

Hypothesis Testing:

H_0- There is no association between awareness about information sources and gender of school children.

H_1-There is an association between awareness about information sources and gender of school children.

Since the calculated Chi-square value is (15.84934) much smaller than the table value (30.144), the null hypotheses (H_0) is accepted and the alternative hypotheses (H_1) is rejected. Hence, it can be concluded that there is no association between awareness about information sources and gender of school children. From table-7.1.B it can be found that awareness of information sources is similar irrespective of the gender.

Table No-7.1.C: Awareness of information sources to gather information Vs Domicile (N=1050)

Information Sources/ Aware	Domicile		Total
	Rural (N=408)	Urban (N=642)	
Books	408 (100.0)	642 (100.0)	1050(100.0)
Journals	20 (4.9)	41 (6.4)	61 (5.8)
Magazines	250 (61.3)	365 (56.9)	615 (58.6)
Encyclopedia	4 (1.0)	2 (0.3)	6 (0.6)
Dictionaries	370 (90.7)	574 (89.4)	944 (89.9)
Internet	378 (92.6)	642 (100.0)	1020 (97.1)
Newspaper	334 (81.9)	523 (81.5)	857 (81.6)
Audio/Video material	295 (72.3)	489 (76.2)	784 (74.7)
CD-ROM databases	19 (4.7)	27 (4.2)	46 (4.4)
DVD	237 (58.1)	333 (51.9)	570 (54.3)
Online databases	18 (4.4)	11 (1.7)	29 (2.8)
Educational materials	408 (100.0)	605 (94.2)	1013 (96.5)
Class room lecture	408 (100.0)	642 (100.0)	1050(100.0)
Radio	408 (100.0)	514 (80.0)	922 (87.8)
Television	294 (72.0)	642 (100.0)	936 (89.1)
Discussion with teacher	408 (100.0)	642 (100.0)	1050(100.0)
Discussion with friends	408 (100.0)	416 (64.8)	824 (78.5)
Parents	408 (100.0)	642 (100.0)	1050(100.0)
Neighbors	373 (91.4)	576 (89.7)	949(90.4)
Training programmes	24 (5.9)	57 (8.9)	81(7.7)
$X^2 = 87.68025$ df = 19 $\alpha = 0.05$ $X^2_{(t)} = 30.144$ Remark= Significant			

(Note: Figures in the parentheses indicate the percentages)

Hypothesis Testing:

H_0- There is no association between awareness about information sources and domicile of school children.

H_1-There is an association between awareness about information sources and domicile of school children.

Since the calculated Chi-square value is (87.68025) more than the table value (30.144), the null hypotheses (H_0) is rejected and the alternative hypotheses (H_1) is accepted. Hence, it can be concluded that there is an association between awareness about information sources and domicile of school children. From table-7.1.C it can be observed that rural children have an edge over their urban counterparts are considered as far as awareness of magazines, dictionaries, radio, discussion with friends and neighbors. Awareness of urban children is better for sources of information like journals, internet, audio-visual materials and television.

Table No-7.2: Purpose for which information was gathered and used Vs Use of information sources **(N=1050)**

Purposes	Use of Information Sources			Total
	Print based sources	Internet based sources	Both type of sources	
Gaining the knowledge	69 (100.0)	102 (100.0)	879 (100.0)	1050(100.0)
Update knowledge	62 (89.9)	97 (95.1)	776 (88.3)	935 (89.0)
Do assignment	26 (37.7)	14 (13.7)	133 (15.1)	173 (16.5)
To solve question papers	3 (4.3)	13 (12.7)	35 (4.0)	51 (4.9)
Examination preparation	68 (98.6)	101 (99.0)	871 (99.1)	1040 (99.0)
For supplementary reading	2 (2.9)	2 (2.0)	8 (0.9)	12 (1.1)
Reading/Studying	69 (100.0)	102 (100.0)	879 (100.0)	1050(100.0)
Prepare for the talent exam	3 (4.3)	4 (3.9)	36 (4.1)	43 (4.1)
X^2= 17.76088 df= 14 α= 0.05 $X^2_{(t)}$= 23.685 Remark= Non-Significant				

(Note: Figures in the parentheses indicate the percentages)

Hypothesis Testing:

H_0- There is no association between purpose for which information was gathered and used and use of various types of information sources.

H_1- There is an association between purpose for which information was gathered and used and use of various types of information sources.

Since the calculated Chi-square value is (17.76088) much smaller than the table value (23.685), the null hypotheses (H_0) is accepted and the alternative hypotheses (H_1)

is rejected. Hence, it can be concluded that there is no association between purpose for which information was gathered and used and use of various types of information sources. From table-7.2 it can be found that purposes, for which information was gathered and used, remain the same for all types of information sources.

Table No-7.3: Methods used for gathering information Vs Satisfaction with search outcomes

Methods	Satisfaction with search outcomes		Total
	Yes	No	
Discussion with teachers	607 (73.4)	194 (87.0)	801 (76.3)
Discussion with friends	79 (9.6)	9 (4.0)	88 (8.4)
Discussion with library staff	46 (5.6)	3 (1.3)	49 (4.7)
Consulting knowledgeable person	95 (11.5)	17 (7.6)	112 (10.7)
Total	**827 (100.0)**	**223 (100.0)**	**1050 (100.0)**
X^2 = 19.787 df= 3 α= 0.05 $X^2_{(t)}$=7.815 Remark= Significant			

(Note: Figures in the parentheses indicate the percentages)

Hypothesis Testing:

H_o- There is no association between methods used for gathering information and satisfaction with search outcomes.

H_1- There is an association between methods used for gathering information and satisfaction with search outcomes.

From the calculated Chi-square value it can be found that methods used by school children for gathering information including discussion with teachers, friends, library staff and consultation with knowledgeable persons has no bearing on the satisfaction with search outcomes. Hence, the null hypotheses (H_o) is rejected and the alternative hypotheses (H_1) is accepted. From table-7.3 it can be found that satisfaction with search outcome has a bearing on the methods used by school children.

Table No-7.4: Problems faced while gathering the information Vs Information sources usually consulted (N=1050)

Problems	Information Sources			Total
	Print based sources	Internet based sources	Both type of sources	
Materials not available	11 (15.9)	23 (22.5)	305 (34.7)	339 (32.3)
Library staff not willing/ unfriendly	16 (23.2)	48 (47.1)	223 (25.4)	287 (27.3)
Incomplete information materials	44 (63.8)	56 (54.9)	717 (81.6)	817 (77.8)
Information sources far located	60 (87.0)	96 (94.1)	710 (80.8)	866 (82.5)
Lack of time	64 (92.8)	92 (90.2)	789 (89.8)	945 (90.0)
Don't know how to use catalogue	69 (100.0)	102 (100.0)	879(100.0)	1050(100.0)
Information scattered in too many sources	66 (95.7)	99 (97.1)	856 (97.4)	1021 (97.2)
Information materials old	15 (21.7)	29 (28.4)	60 (6.8)	104 (9.9)
X^2= 38.12314 df= 14 α= 0.05 $X^2_{(t)}$= 23.685 Remark= Significant				

(Note: Figures in the parentheses indicate the percentages)

School children under study were asked to list out the problems faced by them. It is found from table-7.4 that no single child was knowing how to use catalogue. A large majority quoted scattering information in too many sources (97.2%, N=1021), lack of time (90%, N=945), location of information in far of sources (82.5%, N=866) as the major problems. A significant proportion of school children said non availability of information (32.3%, N=339) and unwilling/ unfriendly staff (27.3%, N=287) as the problems. 9.9% (N=104) of users cited old information materials as the main problem for gathering the information.

Hypothesis Testing:

H_0- There is no association between problems faced while gathering the information and information sources usually consulted.

H_1- There is an association between problems faced while gathering the information and information sources usually consulted.

Since the calculated Chi-square value is (38.12314) more than the table value (23.685), the null hypotheses (H_0) is rejected and the alternative hypothesis (H1) is accepted. Hence, it can be concluded that there is an association between problems faced while gathering the information and information sources usually consulted.

8. FINDINGS AND RECOMMENDATIONS:

1. 83.7% (N=879) of school children consult both types of sources i.e. print based and internet based sources.
2. More than three fourth of the school children 78.8% (N=827) who referred text books and class notes felt satisfied with the search outcomes. 34.4% (N=125) of school children who referred previous assignments felt unsatisfied with the search outcomes.
3. Every school child is aware of books, educational materials, radio, television, teacher, friends, parents and class room lectures as sources of information. A very large majority of school children were also aware of internet (93.6%, N=938), neighbors (90.4%, N=949), dictionaries (89.9%, N=944) and newspapers (81.6%, N=857) as information sources.
4. A large majority (97.2%, N=1021) of school children felt that scattering of information in too many sources is the main problem faced by them while gathering the information.

- Based on the findings of the study, the following have been recommended in order to improve the use pattern of information sources in school environment.

1. Schools have to recognize the importance of libraries in their premises, as vital tool to satisfy the curricular, co-curricular, current and recreational information needs.
2. Regularly organize user orientation, user education and information literacy programmes to create awareness and promote use of information sources.
3. Each school has to introduce comprehensive information literacy programmes by understanding the skills and deficiencies of school children.

4. Teachers have to prepare students to integrate information search and use skills along with technology tools to find, use, apply and evaluate information for specific needs and tasks.

9. CONCLUSION:

The variety of information sources is essential to facilitate the school library fulfill its functions among which are: to thoroughly provide information sources necessary for the school educational programmes and to help in improving and rising the reading skills and learning habits of students. School library help to support the school curriculum by providing up-date information to keep teachers and students abreast of new development. The above key findings revealed that the most frequently used information sources by secondary school children are only text books and class notes. Moreover, other information sources, such as dictionaries, encyclopedia, patents, journals and standards/specifications were not accessible by children hence those sources were not satisfactory to meet their information needs.

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User perception on use of library services at Arya Kanya Mahavidyalya, Shahabad Markanda (Kurukshetra): A case study

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Dr KIRAN LATA

Abstract: No library can develop without proper provision of well balanced collection of books and other reading material related to needs of its users. On other hand users are the judges who make judgment about its worthiness. We should have adequate knowledge of library users and their behavior of seeking information. Understanding the user is necessary to evaluate the library collection and services. But knowing the user is not easy, for this we have to receive the feedback from user from time to time. The present study is a survey through questionnaire to know the user perception of usability of various library services at Arya Kanya Mahavidyalya. This study highlights the users' perception on use of library services and also highlights the problems encountered by users in using the library services on various aspects.

Keywords: Academic Library, Services of Library, Users needs, Information Seeking Behavior

1. Introduction:

At once library was just regarded as storehouse of books, where books were kept for preservation and librarian was only custodian of these books. But now the meaning of library has changed. Now a day's library has become service institution, which not only provides books, but also provides information to its target users when needed. If the purpose of education is learning, then the library is an indispensable source of learning and there is no replacement of it. Today's libraries are working on five laws of library science given by S.R.Ranganathan which aim to satisfy the maximum needs of library users.

Although academic libraries share some features and characteristics, they differ each other in several ways. The character of these libraries is determined by the nature of their respective users & their information requirement. User

is the important component of a modern library system, which draw maximum benefit from library. So, it is most important for a library to know its users so that they can achieve maximum benefit from library. But knowing the user is not easy process. Now a days libraries are conducting user survey or user studies to know their users & theirs information requirements. This paper is also a type of user study to be conducted by the library to know its users & their level of satisfaction regarding various services & resources of library.

2. College Library:

The College Library was established in 1968 with the establishment of College. The College library support the academic requirement of its target users i.e. faculty and student. The College has a well stocked electronic library. It's all functions like acquisition, circulation, cataloguing & serials are automated. The library has more than 32000 books on all disciplines i.e. science, commerce & humanities. The library subscribed more than 51 journals and periodical & 12 newspapers to keep its target users up to date regarding their fields. Bounded issue of Back volume is also available in the library. Apart from this library also subscribed e-journals or e-books through Inflibnet N-List Program. There is proper provision of light & ventilation in the Library & library has separate section for UG & PG classes. The College library has more than 150 sitting capacity & provide facility of Open Access to its users, so that they can choose the books of theirs requirement.

3. Objective of study:

- To identify the level of information demands of library user.
- To access the user satisfaction & dissatisfaction with library services.
- To access the attitude & behavior of users toward library collection and services.
- To identify relationship between library services and users.
- To find out opinions of users toward adequacy of library services and resources.
- To identify the methods which are adopted by library users to access the information.

- To encountered the problems faced by library users in using library services and resources.
- To judge the limitations of library system & services.

4. Methodology:

Survey method is adopted to examine the usability of users on using various services and resources of library. 200 questionnaires were personally distributed among the undergraduate students of two disciplines i.e. Science and Commerce to know their views toward library services and resources. 200 questionnaires out of 200 questionnaires were received back fully filled by respondent. Interview technique is also adopted where necessary to obtain information from respondent.

5. Data analysis and Interpretation:

The 200 questionnaire were distributed personally among the users to know their views regarding library services and resources. After collection, the data is analysis to find strong view point of respondent.

Detail about respondent is given in Table 1

Table 1: Categories of users

Status of users	Questionnaire distributed	Response	Percentage %
Under Graduate	200	200	100%

Table 2: Class wise status of users

Sr.No	Class wise status	Number of respondent	Percentage %
1.	Science	100	100 %
2.	Commerce	100	100 %
	Total	200	100 %

Table 2 depicts the class wise distribution of users. From this table it reveals that 100 users belong to science group and 100 users belong to Commerce Group.

Table 3: Frequency of visit in library

Frequency	Number of Respondent		Total	Percentage %
	Science	Commerce		
Almost Daily	32	28	60	30%
Several Times in a week	48	32	80	40%
Once in a Week	16	26	42	21%
Rarely	8	10	18	9%
	Total		200	100%

This table shows that 30 % of respondent daily visit the library. The Percentage of users who visit the library several times in a week is 40%. 21% of users visit the library once in a week. And only 9% of users rarely visit the library. The table depicts that library is properly used by its users.

Table4: Purpose of visit the library

Purpose	Number of Respondent		Total	Percentage %
	Science	Commerce		
For borrowing books	50	46	96	48%
For studying course material	26	28	54	27%
For competitive exams	6	8	14	7%
For e-resources	8	4	12	6%
For any other purpose	14	10	24	12%
	Total		200	100%

It is found that 96(48%) user visit the library for borrowing books & other reading material. 54(27%) users come to library to study the course material.

14(7%) users go to library for consulting the material of competitive exams. 12(6%) users go to library for consulting e-resources, and 24(12%) users go to library for other purposes like reading newspaper etc. This table shows that majority of users visit the library only for issuing/ returning the books.

Table 5: Satisfaction with Library hours

Satisfaction	Number of Respondent		Total	Percentage %
	Science	Commerce		
Satisfied	80	90	170	85%
Dissatisfied	20	10	30	15%
	Total		200	100%

Table 5 shows that 170 (85%) respondent are satisfied with opening hours of library, whereas only 30(15%) users are not satisfied with opening hours of library.

Table 6: User preference to library resources

Resource Type	Number of Respondent		Total	Percentage %
	Science	Commerce		
Reference books	43	21	64	32%
Text books	56	52	108	54%
News papers	39	37	76	38%
General & Competition Magazines	28	20	48	24%
Journals	16	8	24	12%
Book of General Knowledge	43	22	56	28%

The table 6 depicts that more students i.e. 54% of users visit the library only for consulting the text book, whereas 38% of users visit the library for reading the newspapers, 32% of users visit the library for consulting the reference book &

24% of users visit the library for consulting the books of General Knowledge. This table shows that mostly users visit the library only for consulting the text-books.

Table 7: Methods used in locating the needed Information or document

Method	Number of Respondent		Total	Percentage %
	Science	Commerce		
Consulting Catalogue	41	43	84	42%
Guidance from teachers	26	18	44	22%
Assistance from friend	34	42	76	38%
Self Experience	52	50	102	51%

The table 7 shows the methods or techniques used by students to find out the information or document of their requirement. This table shows that 102 (51%) user use the library by self experience, 42% of users find out books with the help of OPAC, 38% of users take assistance from their friends & 22% of users take assistance from faculty members or from library staff in finding documents or information of their interest or requirement.

Table 8: Satisfaction with Library Services

Library & Information Services	Satisfied		%	Not Satisfied		%
	Science	Commerce		Science	Commerce	
Reference Service	49	55	52%	11	5	8%
Circulation service	66	70	68%	3	1	2%
OPAC	18	26	44%	6	14	10%
Reprography	28	22	50%	7	9	8%
Internet service	22	14	36%	6	8	14%

Loan Period	28	38	66%	1	3	2%
Display/New Arrivals	45	37	42%	4	2	3%

The table 8 shows the satisfaction or dissatisfaction of users regarding various services which are being provided by the libraries to its target users. The table shows that majority of users are satisfied with the services which are being provided by library, whereas very short percentage of users are not satisfied with the services rendered by the library.

Table 9: Users Opinion about Facilities available in the Library

Facilities	Satisfied		%	Not Satisfied		%
	Science	Commerce		Science	Commerce	
Reading Space	81	59	70%	1	3	2%
Lighting	72	76	74%	4	2	3%
Ventilation	68	66	68%	-	4	2%
Equipment	90	62	76%	4	16	10%
Cleanliness	89	71	80%	-	2	2%

Table 9 depicts library's users' opinion about various facilities available in the library, the results are clear that majority of users are satisfied with these facilities & very short percentage of users are dissatisfied with the facilities.

Table 10: Adequacy of Library Collection

Adequacy	Number of Respondent		Total	Percentage %
	Science	Commerce		
Adequate	82	74	156	78%
Not Adequate	12	28	44	22%
	Total		200	100%

The table 10 depicts the users, satisfaction with adequacy of library collection. This table shows that 78% of users are satisfied with library collection whereas 22% of users need more improvement in collection.

Table 11: Attitude of library staff

Attitude	Number of Respondent		Total	Percentage %
	Science	Commerce		
Friendly	74	90	134	67%
Not Friendly	42	24	66	33%
	Total		200	100%

The table 11 indicates the result of analysis of data about the attitude of library staff. The result depicts that behavior of library staff towards users is very good, but 33% of users are not satisfied with staff behavior.

Table 12: Conduciveness of atmosphere

Atmosphere	Number of Respondent		Total	Percentage %
	Science	Commerce		
Conduciveness	59	49	108	54%
Not Conduciveness	40	52	92	46%
	Total		200	100%

A good library should have a Conducive atmosphere. When users were asked about the atmosphere of library, the 54% of users said that the atmosphere of library is conducive whereas 46% of users said that noise and crowd disturb them.

Table 13: Satisfaction with existing services

Satisfaction	Number of Respondent		Total	Percentage %
	Science	Commerce		
Satisfied	71	57	108	64%
Not Satisfied	40	42	92	36%
	Total		200	100%

This table shows that 64% of users are satisfied with the existing services of library, whereas 36% of users are not satisfied with the services.

Table14: Need for Improvement in services or collection building

Need	Number of Respondent		Total	Percentage %
	Science	Commerce		
Yes	54	58	112	56%
No	42	46	88	44%
	Total		200	100%

Lastly when users were asked whether they want any improvement in existing services or in collection building of library than 56% of users said yes, they want more improvement in both.

Findings:

On the basis of analysis of result, the following findings have come out:-

- Majority of users visit the library several time in a week.
- Majority of users visit the library for consulting the text books only.
- Majority of users are satisfied with the opening hour of library.
- Majority of users locate the information or document of their interest

with self experience.

- Majority of users are satisfied with the services are being rendered by the library.
- Majority of users are satisfied with behavior of library staff.
- Majority of users demand for improvement in both: resources & services of library.

6. Suggestions:

- Most of users visit the library several times in a week or once in a week. Therefore the reason behind this situation should be find out & users are to be motivated to use the library daily.
- Most of users visit the library only to borrow books. The users should be motivated to consult books of General Knowledge & books related to Career guidance.
- Proper guidelines & instruction should be displayed regarding use of OPAC. The Library staff can offer training or lecture regarding this.
- The Collection of Library should be improved from time to time.
- Internet facility should be improved.

7. Conclusion:

The failure or success of a Library depends upon its adequate resources & services which are being provided by library to its target users. So, library staff should effort to remove discrepancies from library system and build a sound & comfortable atmosphere for the users so that the maximum use of library can be ensured. The library staff should motivate the users to make maximum use of library resources and services & they should try to identify actual potential reader & should create love for reading & books among them. At last, it is found that installing reading habits among users regarding various resources and services & providing an adequate supply of books to its users is considered as fundamental duty of library system.

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A Case Study of Digital Information Literacy Assessment among the Research Scholars of Delhi School of Economics, University of Delhi

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Abstract: With the advent of ICT, society is changing rapidly where the digital information literacy matters. Present paper discuss in brief about digital literacy and further assess the digital information literacy among the research scholars of Delhi School of Economics, University of Delhi.

Keywords: Digital information literacy; ICT, collaborative learning; and computer self-efficiency.

1. INTRODUCTION

The term *Digital Literacy* was coined by Paul Gilster in his book that was published in 1997, in his book he defined digital literacy as, the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers. Digital literacy creates the skills among the students so that they could use digital information effectively. Today with the advancement of Information and communication technology, the term Digital literacy become a more poplar in academic world. Through this a person must be able to locate, evaluate and use the digital information expertly.According to ALA Digital Literacy Taskforce, "Digital Literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills" (http://connect.ala.org/node/181197).

Martin (2008) gives the five key elements of digital literacy based on previous literature:

1. Digital literacy involves being able to carry out successful digital actions embedded within work, learning, leisure, and other aspects of everyday life;
2. Digital literacy, for the individual, will therefore vary according to his/her

particular life situation and also be an ongoing lifelong process developing as the individual's life situation evolves;

3. Digital literacy is broader than ICT literacy and will include elements drawn from several related "digital literacies";
4. Digital literacy involves acquiring and using knowledge, techniques, attitudes and personal qualities and will include the ability to plan, execute and evaluate digital actions in the solution of life tasks;
5. It also include the ability to be aware of oneself as a digitally literate person, and to reflect on one's own digital literacy development.(Martin, 2008, p.165)

2. LITERATURE REVIEW

Numerous studies have been done on digital literacies all over the world. For instance, the study revealed the digital literacy skills among students of University of Nigeria, Nsukka (UNN) and also focus on these digital literacy skills used by students to complete their academic works .To do this study descriptive survey method is adopted, and students are selected those are using mobile phone network and digital library, the study select 10 percent of the sample (281). A structured questionnaire is was selected to collect data. The questionnaire was randomly administered on the respondents who come to use the MTN digital library with particular attention to the different levels of the students. Out of 281, 184 (65 Percent) were responded. The finding of the study show some of the student possess digital literacy skills, they used digital literacy skills per day in daily life. Majority of the respondents indicated that digital literacy has affected their academic performance to a high. Study found that, major challenges for acquire digital skills include electricity failure, low internet, ICT facilities, lack of development of digital literacy programme and standard.**(Ukwoma, Iwundu, and Iwundu , 2016)** The purpose of this paper is to explore the overall information and digital literacy in developing countries. In this study the case of Pakistan is used to state the poor information and digital literacy. The paper also discusses the common drawbacks to effective information and digital literacy in developing Asian countries. To conduct study, survey method is used to showing the real picture of students and faculty member of Pakistan. The paper found that, information and digital literacy are not in the practice or training in libraries or education. There is low level of IL/IDL among the educated classes. **(Ameen, and Gorman, 2009).** Present article examine the problems that are faced by marginalized populations to access telecenter (internet public access sites). To conduct study, exploratory case study method is used to gather data from both users and telecentre operators. To illustrate the result, a digital information literacy framework is used which is developed by Eshet-Alkai (2004).The findings of the paper reveal that, users of telecentre are illiterate in

three skills: branching ability; "reproduction ability"; and "information ability". Further there are also have been found some technical barriers such as internet access speed, which influence user's behaviors when searching for information. Lastly, the lack of knowledge of the English language, which is the predominant languages in the Internet, is a barrier that widens the digital divide. **|(Huerta and Sandoval, 2007)**

3. OBJECTIVES OF THE STUDY

The objectives of the study are to examine the following aspects;

1. To know the awareness of Digital information literacy among the Research Scholars.
2. To find out awareness and extent of use social networking sites among the research scholars.
3. To examine the purpose of research scholars of using E-resources.
4. To know awareness regarding search engines and web browsers.
5. To find out the most used searching technique by research scholar to retrieve information.

4. SCOPE OF THE STUDY

The scope of the research paper cover digital information literacy assessment among the research scholars of Delhi school of Economics, University of Delhi.

5. LIMITATIONS OF THE STUDY

1. The scope of the study limited to Delhi school of economics.
2. The survey is conducted among research scholars only.
3. This paper is limited to area of digital information literacy.

6. METHODOLOGY

To conduct the study, ***A case study of Digital information literacy assessment among the research scholars of Delhi School of Economics, University of Delhi*** some databasessuch as Emerald, LISA, LISTA, Scopus, JSTOR etc were consulted to retrieve authentic literature. To conduct thisstudy, survey method was applied, in which a well-structured questionnaire wasprepared to collect data. Total 100 Questionnaires were distributed randomly in Ratan Tata Library and 92 filled in questionnaire were collected back from there.Collected data was organized and analyzed with the help of MS- Excel software package.

Responses Obtained: The Table 1 furnished below shows the response rate of the research scholars of Delhi School of Economics, university of Delhi

under study that shows a total of hundred questionnaires were distributed and 92 questionnaires were received back. There was 92% response rate from Delhi School of Economics, university of Delhi.

Table 1: Responses Obtained

Response		Percentage
Distributed	**Collected**	
100	92	92%

Table 2 shows the awareness about digital information literacy, in which majority of respondents are aware about digital information literacy and less are not aware.

Table 2: Awareness about digital literacy

Awareness	**No. of Respondents N = 92**
Fully aware	56(60.8)
Partial aware	32(34.7)
Not aware	4(4.3)

Note: Figure shown in parenthesis represents percentage.

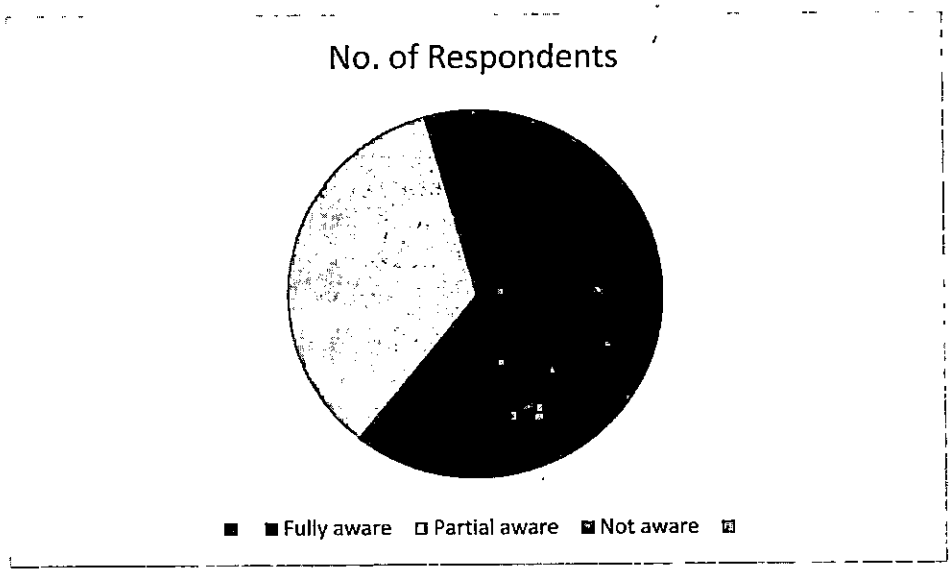


Figure1: Awareness

Table 3 represents the program attended by the research scholars, in which majority of respondents have not attended any digital literacy program. 28% of the respondents have attended digital literacy program and 8% respondents not re-

member whether they have attended or not.

Table 3: Attended any DIL Program

Attended program	No. of Respondents N = 92
Yes	28(30.4)
No	56(60.8)
Not Remember	8(8.6)

Note: Figure shown in parenthesis represents percentage.

Table 4 shows the time expended on Electronic Devices. Majority of respondents (67.3%) devote their more time on electronic devices. 10.8% of respondents do not want to share that how much time they devote on electronic devices.

Table 4: Expended time on E-Devices

Expended time on E-Devices	No. of Respondents
1-5 hours	62(67.3)
5-10hours	14(15.2)
More than 10 hours	6(6.5)
Not specified	10(10.8)

Note: Figure shown in parenthesis represents percentage.

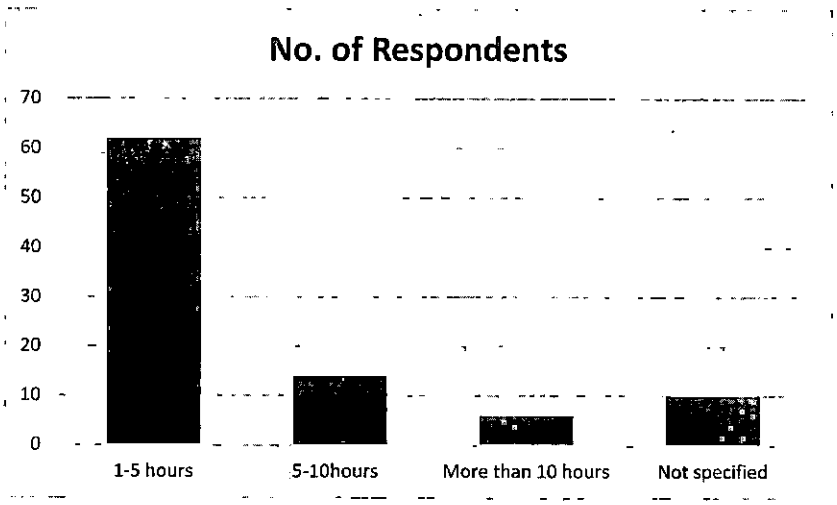


Figure 2:Expended time on E-Devices

Table 5 show the awareness level of social networking sites. It reveal the fact that no respondents are there who do not know about social networking sites. 6.5% of the respondents are aware but they use SNS sometimes.

Table 5: awareness about SNS

Awareness about SNS	No. of Respondents
Yes	86(93.4)
No	0
Aware but Don't use	0
Aware but use some times	6(6.5)

Note: Figure shown in parenthesis represents percentage.

Another question was asked to elicit the responses regarding the frequency of visiting these social networking sites and as expected it was found that maximum users i.e. 76.08% access these sites on daily basis.

If yes, Frequency of using social networking sites

Frequency of using SNS	**No. of Respondents**
Daily	70(76.08)
Once in a week	6(6.5)
Twice in a week	2(2.1)

Occasionally	14(15.2)

Note: Figure shown in parenthesis represents percentage.

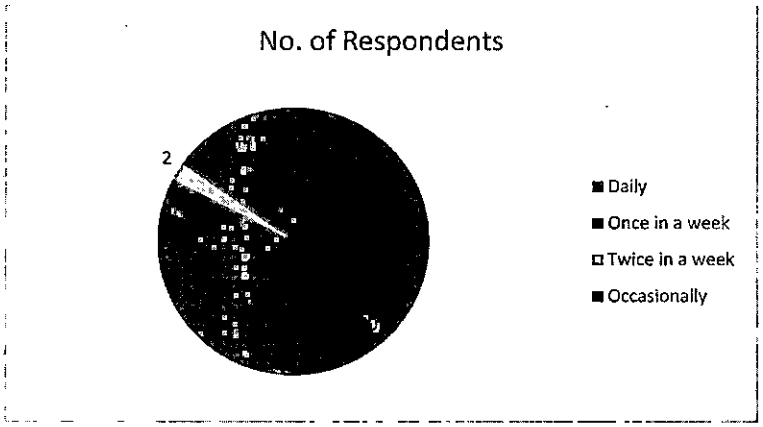


Figure 3: Frequency of using SNS

Table 5.1 shows the devices used by the scholars for accessing various social networking sites. It can be seen that majority of them (91.3%) use their PC and (86.9%)use their smart phones to access social networking sites followed by 58.6 who used laptops.

Table 5.1: Devices used for SNS

Devices	No. of Respondents
PC	84(91.3)
Laptop	54(58.6)
Smartphone	80(86.9)
Tablet	16(17.3)
Others	0

Note: Figure shown in parenthesis represents percentage.

Table 5.2 represents the place where scholars of Delhi school of economics access social networking sites. Majority of respondents (82.6%) access at home whereas 39.1% access in the library. University Computer center comes out to be the least visited place to access SNS.

Table 5.2: Places you prefer for use SNSs

Places for SNSs	No. of Respondents
Library	36(39.1)
Home	76(82.6)
University Computer center	8(8.6)
Hostel	16(17.3)

Any Other Place	0

Note: Figure shown in parenthesis represents percentage.

Table 6 represents the fact that the scholars use computer and internet to E-Mail/ Chat/Instant massaging (76%) whereas 73.9% of the scholars use computer and internet for their research work and to access E-Resources.

Table 6: Purpose and use of computer & internet

Purpose and Use	No. of Respondents
Job/ career	46(50.0)
E-Mail/Chat/Instant massaging	70(76.0)
Games/Entertainment	30(32.6)
Research works/ E-Resource Access	68(73.9)
Any Other	1 (1.0)

Note: Figure shown in parenthesis represents percentage.

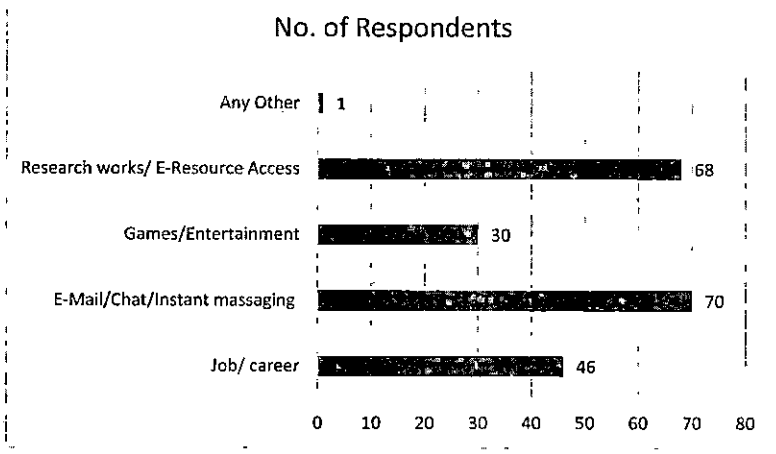


Figure 4: Purpose and Use

Table 7 shows that majority of the scholars (97.8) prefer google search engine to access Internet and very less number of scholars use the others i.e. yahoo (10.8%), Bing (15.2%). Further it was found that nobody opted for Altavista.

Table 7: Use of Search Engine

Search Engines	No. of Respondents
Google	90(97.8)

Yahoo	10(10.8)
Altavista	00
Bing	14(15.2)
Any other	00

Note: Figure shown in parenthesis represents percentage.

Table 8 depicts that majority of the respondents prefer Desktop/Laptop (80.4) to access E-Resources followed by smart phone. Less respondents (8.6) use Kindle/ I Pad.

Table 8: E- Resource access points

Access points	No. of Respondents
Desktop/Laptop	74(80.4)
Smart Phone	42(45.6)
Kindle/ I Pad	8(8.6)
Any other	0

Note: Figure shown in parenthesis represents percentage.

Table 8.1 describes that most of the scholars prefer University library/ Departmental library (93.4)to access E-Resources and less respondents (23.9) access from hostel.

Table 8.1: Places for access E-Resources

Places for access E-Resources	No. of Respondents
University library/ Departmental library	86(93.4)
Hostel	22(23.9)
University Computer center	8(8.6)
Any other	1 (1.0)

Note: Figure shown in parenthesis represents percentage.

Table 8.2 represents the purpose to access E-Resources. Majority of the scholars use E-Resources to keep update subject knowledge and 58.6% of the respondents access E-Resources to support research.

Table 8.2: Purposes for access E-resources

Purposes for access E-resources	No. of Respondents
To update subject knowledge	74(80.4)
To support research	54(58.6)

To write paper for publication	40(43.4)
For preparing class notes	22(23.9)
Any other	0

Note: Figure shown in parenthesis represents percentage.

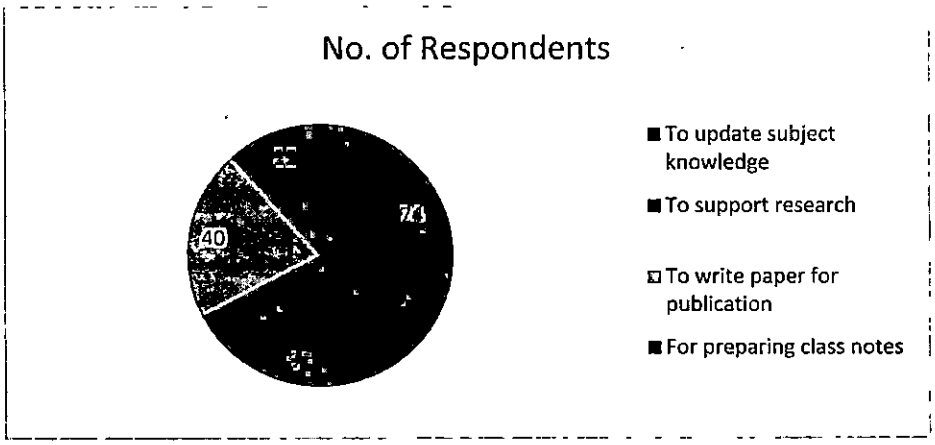


Figure 5: Purpose for access E-Resources

Table 8.3 represents that scholars useE-Journals and E-books to complete their research work. Some of them (32.6) use E-thesis/Dissertation.

Table 8.3: E-resources used for research work

E-resources	No. of Respondents
E-Journals	64(69.5)
E-books	60(65.2)
E-thesis/Dissertation	30(32.6)
Any Other	2 (2.1)

Note: Figure shown in parenthesis represents percentage.

Table 9 shows that most of the scholars (95.6%) use google chrome and 28.2% use Mozilla Firefox. Internet Explorer and Safari is less used web browsers.

Table 9: Web browser used to access internet

Web browsers	No. of Respondents
Google Chrome	88(95.6)
Internet Explorer	18(19.5)
Mozilla Firefox	26(28.2)
Any Other	4(4.3)

Note: Figure shown in parenthesis represents percentage.

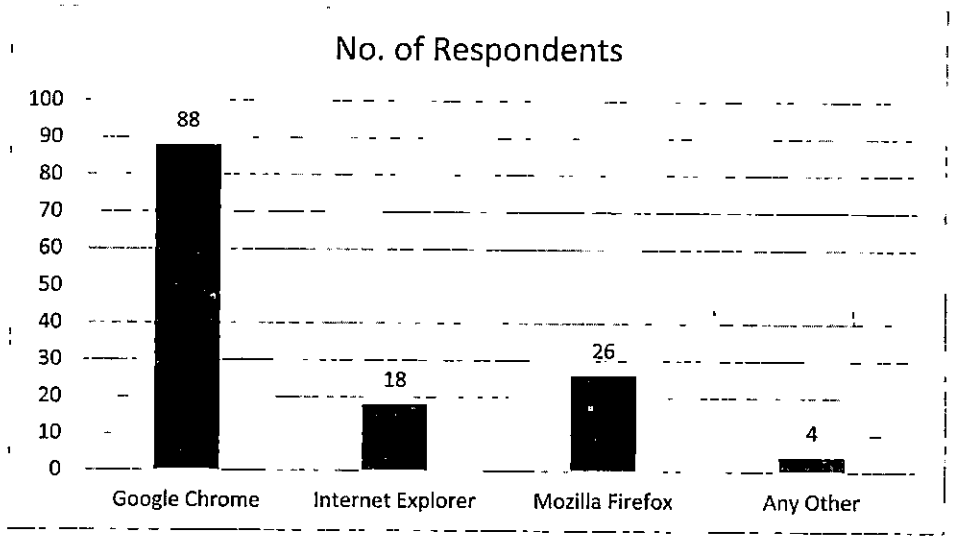


Figure 6: Used web browsers

Table 10 represent that majority of users use Boolean operator searching technique to retrieve information/data. Some of them (30.4%) use proximity searching technique and less use truncation searching technique.

Table 10: Searching techniques used toretrieve information/data

Searching techniques	No. of Respondents
Boolean Operator	38(41.3)
Proximity	28(30.4)
Truncation	10(10.8)
Any other	2 (2.1)

Note: Figure shown in parenthesis represents percentage.

Table 11 shows that theSearch engines and Web Portals search tool is mostly being used by scholars to retrieve data/information

Table 11: search tool is used for retrieve data/information

Search tool	No. of Respondents
Search engines	50(54.3)
Subject Gateways	6(6.5)
Web Portals	42(45.6)
Meta search engines	6(6.5)
Any Others	0

Note: Figure shown in parenthesis represents percentage.

Table 12 reveal the fact that scholars face problems in the access of e-resources. Majority of scholars (45.6%) said that there is limited digital material to use. 28.2% respondents face internet problem and 23.9% respondents face technical problem whereas 26% or respondents are not able to download the data they want.

Table 12: Challenges faced by users to access E-resources

Challenges	No. of Respondents
Internet Problem	26(28.2)
Technical support	22(23.9)
Downloading	24(26.0)
Limited digital material	42(45.6)
Any other	0

Note: Figure shown in parenthesis represents percentage.

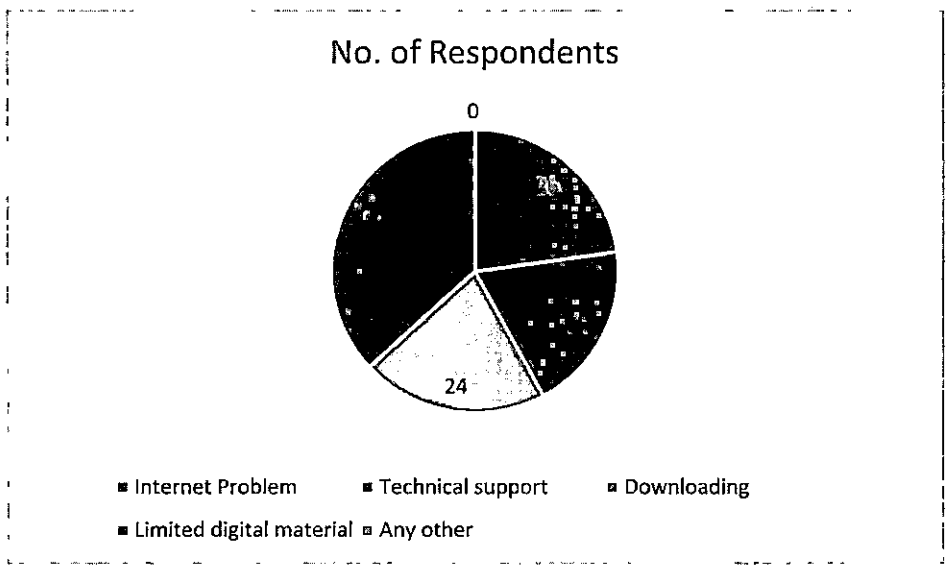


Figure7: Challenges faced by users

Findings and Conclusion

1. Majority of users are well aware about Digital Information Technology but many of them not attended any program of Digital Literacy.
2. Majority of the scholars devote their more time in using Electronic Devices
3. Majority of the scholars are aware and use the social networking sites and 76.08 percent scholars use these sites on daily life. Another fact is also found

that majority of research scholar use the PC to use social networking sites at their home.

4. The findings show that 70(76.0) percent of students use the computer and internet to E-mail/Instant message and chat. 68(73.9) percent scholars use internet and computer for their research work.

5. Majority of students use Google search engine to access the internet and PC/Laptop to access e-resources.

6. 93.4 percent scholar prefer departmental library or University library to access the E-resources and 80.4 percent scholar access the E-resources to update subject knowledge. A larger part of research scholar use E-journals to complete their research work.

7. A mass part of research scholar use the Google chrome web browser to access internet. The finding also shows that, 38(41.3) percent of scholar use Boolean operator searching technique to retrieve information/data in compared to other technique.

8. The study found50(54.3) percent scholar use the search engine as a searching tool to retrieve information and 42(45.6) percent scholar use web portals.

9. The last finding said 42(45.6) percent of scholars face the problem of Limited digital material and 26(28.2) percent face the internet problem.

- The conclusion is last of each and every research in which researcher sum up his research article, same here in Digital information literacy assessment among the research scholar of Delhi school of economics, university of Delhi: Case studywe can conclude that this paper explore the tacit knowledge of respondents in various aspects, which is very useful to implement new things or techniques in libraries for providing better and advance services to scholars. This paper is very useful to review technical skills among scholars to complete their research work.

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Bridging the Digital Divide: Role of Public Libraries in India

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Abstract: *The primary purpose of this paper is to critically examine the potential role of public library in bridging digital divide. The paper also deals with importance of public library in promoting e-governance amongst the people and need for ICT driven public library in the modern society also discussed. Besides this the problems faced by the public libraries in India while providing some of the important services to its users also highlighted.*

Keywords: Digital Divide, Public Library, ICTs, Digital Technologies, E-governance, India.

1. Introduction

'Digital Divide' is one of the most talked terms in recent times. The use of digital technologies or Information Communication Technologies (ICT) has become necessary and inevitable in the modern world. Today one of the parameters of assessing societal development of a country is the extent to which there has been penetration of information and communications technology (ICT) through the Internet, mobile phone subscriptions. In modern world information, services, and resources are increasingly available only through online, people without access to a computer or the Internet are at a considerable disadvantage. They may lack the ability to access information resources, or the knowledge. This lack of ability and non accessibility is likely to have a negative impact on their ability to succeed by limiting their access to informational, educational as well as recreational resources. In turn the majority of people in the country like India are not involving in the socio-economic development nation. This is vice-versa in the case of developed

countries.

In these circumstances, public library can play a vital role in bridging the digital divide, particularly in the developing country like India where use of ICTs is kind of restricted to some privileged people. The gap between technology haves and technology have nots is extremely wide in India. That's why Public library should provide free access to computers, Internet services to those who could not otherwise access these resources. Public library also should provide training and assistance to those who lack technology skills or who have difficulty in using Internet resources and services. Such type the training programmes are going to create lots awareness in the minds of people and in turn they can learn how to use technology day to day activities. In which the majority of the people involving in different kinds of activities for earning their livelihood.

2. Digital Divide

The Term "digital divide" refers to the perceived gap between those that have access to computer, internet and online information. It encompasses both physical access to technology hardware and, more broadly, skills and resources which allow for its use. The digital divide commonly used in relation to age, gender, income group and language among people within a community or country. 'Digital Divide' has been applied to the gap that exists in most Countries between those with ready access to the tools of information and communication technology and the knowledge that they provide access to and those without such access skills.

There are many causes which contribute to create digital divide. Primary reasons are gender discrimination, low literacy rate, education system, and physical disability, economic and social status of the country. Other than this age, attitude of people and language also play a vital role in creating digital divide.

3. Defining Digital Divide

The United National Education, Scientific and Cultural Organization (UNESCO, 2000) defined the digital divide as a phenomenon that results from the unequal application of, and access to, information and communication technologies leading to a global knowledge gap between information 'haves' and have-nots.'

The American Library Association's Office for Information Technology Policy defines the digital divide as the differences due to geography, race, economic status, gender and physical ability in access to information through the Internet, and other information technologies and services; and in the skills, knowledge, and

abilities to use information, the Internet and other technologies.

4. Public Library

The public library, the local gateway to knowledge, provides a basic condition for lifelong learning, independent decision-making and cultural development of the individual and social groups. This Manifesto proclaims UNESCO's belief in the public library as a living force for education, culture and information, and as an essential agent for the fostering of peace and spiritual welfare through the minds of men and women.

Public libraries are a world-wide phenomenon. They occur in a variety of societies, in differing cultures and at different stages of development. Although the varied contexts in which they operate inevitably result in differences in the services they provide, and the way those services are delivered, they normally have characteristics in common, which can be defined as, "A public library is an organization established, supported and funded by the community, either through local, regional or national government or through some other form of community organization. It provides access to knowledge, information and works of the imagination through a range of resources and services and is equally available to all members of the community regardless of race, nationality, age, gender, religion, language, disability, economic and employment status and educational attainment."

5. Role of Public Libraries in Bridging Digital Divide

A public library is at the forefront of articulating the value of freely available information and ensuring that people have the skills to access and utilize this information. Public library is clear about its longstanding mandate regarding literacy and inclusion, and for some time is been extending that mandate from the physical to the digital realm. Public Library has to provide the infrastructure, connectivity and skills development which communities require to minimize the personal and community risks which the long discussed digital divide.

Public libraries are instruments of equal opportunity and must provide a safety- net against alienation and social exclusion from technological advance by becoming the electronic doorway to information in the digital age. The public library's role is becoming one of mediator, of being the public's electronic doorway to digital information and of helping citizens cross the 'digital divide' to a better future.

Spreading Awareness

Spreading awareness about ICTs is the first and foremost thing. A public library can play a crucial role in this endeavor of spreading awareness about digital technologies because of its wide influence and reach on the society. Public library is a most influential organization across all sections of the society. ICT is playing a dominant role and further it is going to play a crucial role in the development of the nation in general and the public in particular. Hence the role of public libraries is increasing in the developing country like India.

Free Access

Secondly, Public library should provide free access to computers, internet and other related technologies to its users along with traditional information resources like printed and other information resources. This step of public library will be helpful in bridging digital divide since, most of the people do not have access to all these digital technologies at home or otherwise. In this connection central and the state governments including local self governments can take initiation and invest more money and develop the rural public libraries as digital libraries.

Training and Assistance

Not only should public library provide access to digital technologies to its users but also it must conduct some training programmes at regular intervals for them to utilize these resources and services. The training to users has to be provided by the skilled professionals. The users of library should also get able assistance from library staff in using them. Hence it is suggested to the authorities at the district, block and local level to provide better infrastructure facilities and the experts to organize regularly such type of the training programmes especially in the rural areas.

Education

A public library is considered as important institution in providing formal and informal educations to its citizens. Public libraries are doing pioneering work in providing adult education likewise; public library should also impart education on digital technology to citizens. For example, how to use digital technology, pros and cons of using the technology etc. But unfortunately in the country like India the public libraries have failed to promote quality education which is most essential for the youth. At least now on priority basis public libraries can provide better education in the field of ICT along with regular education. Now it is prime time for public libraries in India to promote ICT education for the masses.

6. Public Library and E- Governance

The World Bank defines E- Governance as (AOEMA report): "E-Government refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions."

Public libraries can provide a vital link between government and people. As government information, services, and resources became very much online, a public library serve as important community gateways to electronic government (E-government). The public Libraries increasingly play an essential role as service providers in E-Government systems. The role of public libraries in promoting E- governance is particularly important for those who live in rural areas as well as urban areas as it serves the very idea of 'minimum government, maximum governance.' The impact of E- governance on rural and urban community is huge in other words; it has revolutionized the methods of interaction between government and common people.

7. Problems with Public Libraries in India

Access to ICT in India continues to be marginal due to high cost of connectivity resulting in their exclusion from the emerging global system. Despite advances in ICT the benefits have not reached the majority of the population particularly socially and economically backward classes. The main reason why the public library movement has not yet reached the take-off stage is the acute paucity of funds, lack of priorities on the part of government, enactment of library legislation and absence of an integrated approach to social welfare and community development.

- A considerable percentage of the population is illiterate or functionally literate forcing library to be of minimal use to them;
- Poor allocation for the infrastructure improvement and collection development for public libraries;
- Lack of enough sanctioned posts, forcing most of the services to be operated by voluntary
- Non-professional staff, causing sufficient deterioration on information organization and servicing;

- There is also a problem of highly educated and well trained professionals preferring to work in special and academic libraries than public libraries;
- Little emphasis on adoption Information & Communication Technology for public library systems and services;
- Lack of public libraries in numbers at urban as well as in rural areas.

8. ICT Driven Public Libraries –the need of the hour

ICT driven public libraries are the need of the hour. Thus, Public Libraries around the country should implement various strategies to best serve their community with digital technologies. There is and there will be a growing need for government and public libraries to collaborate more to provide digital technologies (ICTs) to meet the needs of their communities. By working together, government agencies and public libraries will attain ultimate goal of information for all. If digital technologies were properly implemented than only it is possible for the public libraries to be better able to meet patron needs and patrons will resolve their informational needs on their own.

ICT driven public libraries should act as mediator between users and information with suitable awareness programs. Public libraries are considered as the nerve centre for improving literacy, social awareness, welfare and cultural awakening, it is the intention to put public libraries in the right perspective to arrive at a single window integrated digital environment for information dissemination concerned with all aspects of human life. The government of India is planning, preparing and eager to implement cashless society. This can be possible in collaboration with the public libraries because the public libraries are considered as people's universities. If public libraries properly developed by providing all possible ICT facilities especially in rural areas.

9. Conclusion

Public libraries are most significant entities in bridging the gap of digital divide. Public Libraries have long been essential agents in fostering peace and human values. Libraries are now operating digitally, and their digital services open up a new channel to the universe of knowledge and information connecting cultures across geographical and social boundaries. The phenomenon of digital discrimination prevailing among various social, political and working groups has led to the emergence of digital information rich and digital information poor groups within societies and perhaps in the global environment.

Modernization and up-gradation of Public libraries in terms of ICT application with the view of meeting informational, educational, cultural and recreational needs of under privileged masses and increase their capabilities for using them. The information society is built on a foundation of collaboration and communication enabled by electronic networks. Public libraries in India should adopt latest convergence technologies and have well maintained infrastructure ably supported by professionally trained competent staff; and have motivation to work greatly towards removing digital divide among its users. This is possible only through proper collaboration between central and state government. But unfortunately even after completion of seven decades of India's independence, both the governments including local governments are not so serious about establishment of public libraries in every nook and the corner of the country. The present society not only demands for the public library services, it demands ICT based resources and services because this is the order of the day.

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Development of Digital Libraries

Ms.Yashoda and Krishna

Abstract: Digital Libraries (DLs) have traditionally been positioned at the intersection of library science, computer science and networked information systems. The different underlying philosophies of these three fields have had an unsettling influence on the development of Digital Libraries. While library science is fairly mature, networked information systems are constantly evolving to keep pace with Internet innovation. We already know that thousands of Internet accessible web pages offer a huge array of information, however questionable the reliability and value of many of them may be.In addition, there are websites that serve as portals to the catalogues and digital collections of libraries. Digital libraries basically store materials in electronic format and manipulate large collections of those materials effectively.Digital Information can be accessed rapidly around the World. Moreover, copies are preserved easily, stored compactly, and retrieved very quickly. Digital resources help in empowering libraries and enhancingtheir effectiveness and efficiency. Digital libraries have created and promoted innovative information services with digitization of resources. This paper highlights the development of Digital Libraries.

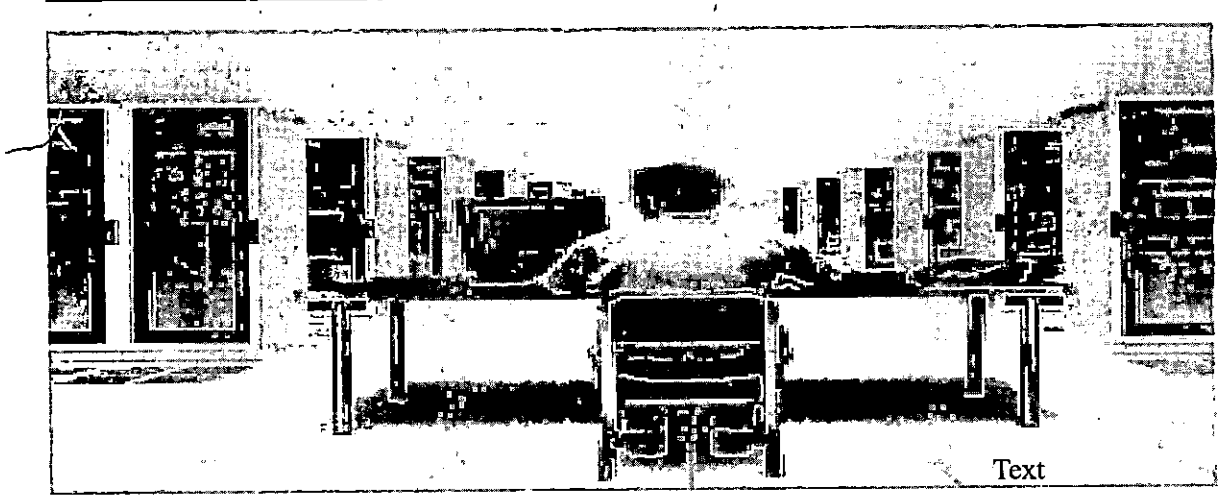
Keywords: Major Components, Major Process, Digital collection, Copy Right and Licensing, Digitalization and Equipment needed.

1. Introduction

Unlike previous eras, ours is an age of lifelong learning. Society expectsthat people will continually gain new skills and knowledge. Economically,continuing education is critical for one's ability to maintainearnings potential. Sociologically, education has become increasinglyimportant as the core of professional and personal success.The library, historically a cornerstone of scholarly endeavor, is reinventingitself in today's networked society to meet these new demands.Instead of a building that holds books, the library is evolvinginto an electronic portal to a growing global collection of digitalcontent.

2. What is a digital library?

It is concerned with that body of knowledge relating to the collection, organization, storage, distribution, retrieval, and utilization of digital information. Digital libraries basically store materials in electronic format and manipulate large collections of those materials effectively.



3. Major Components

Digital objects

The actual content of digital libraries is made up of a number of digital objects. In some cases these may be thought of as data sets (e.g., a table of results, the genomic information for an individual). In others they may be multimedia information, such as an image, graphic, animation, sound, musical performance, or video. Many can be thought of as documents, which carry content in some structure or structures, perhaps made up of logical or physical divisions such as sections or pages. Some of the objects will be "born digital", such as this paper, while others may be representations of some physical object (such as a painting that is shown through a digital image) that result from some type of digitization process. Thus, into the foreseeable future, digital libraries will be hybrid constructs, where paper, microforms, and other media carry much of the content that is of interest and only the metadata is in digital form.

Metadata

Digital objects are described, structured, summarized, managed, and otherwise manipulated in surrogate form through the use of "metadata", which literally means data about data. Three types of metadata are often distinguished: descriptive, structural, and administrative. Metadata is usually produced through a process called "cataloging" that is often carried out by trained librarians. Collections of such information are commonly stored in "catalogs". In computerized environments, metadata may be automatically or semi-automatically extracted or derived from the original content, or the "full-text" may simply be indexed and searched without involving metadata (as happens on the WWW when search engines are employed). Yet, if only metadata is available in computer form to describe a digital object, it must be used in digital libraries. Hence, metadata should be used whenever available in a digital library, and is an important aspect in many such systems.

Rights Management

Multimedia information, and repositories are the "rights manager" which must protect intellectual property rights. In the trivial case, which fortunately is common, content is freely available so nothing is needed here. In some cases too, where content is translated, content management is outside the scope of the digital library, since secure objects are stored and retrieved and the steps of encryption and decryption occur remotely. Similarly, some content may have "watermarks" added in a way that makes removal difficult, so that subsequent access outside the digital library can be monitored or controlled.However, as e-commerce, e-government, and other movements spread, it will be crucial for many digital libraries to manage rights. This typically involves a number of steps:

Indexing, Resource Discovery, Searching, and Retrieving

Indexing may build upon any manual indexing carried out by authors, other creators, or indexers. Automatic indexing also may involve first classifying DOs, such as when OCLC's CORC project software suggests Dewey decimal classification entries for a WWW page that is being cataloged. Indexes may be centralized or distributed. They may be two-level, allowing a resource discovery phase to proceed to find what source(s) should be included in the subsequent (lower) level search. Indexes also may have multiple parts, such as when a document has text, image, audio, or video content. Content-based indexing of multimedia information generally involves identifying and assessing features that characterize the DOs, whether they involve concepts, n-grams, words, keywords, descriptors, phonemes, textures, color histograms, eigenvalues, links, or user ratings.Most commonly, searching in a digital library involves an information retrieval system or search engine.

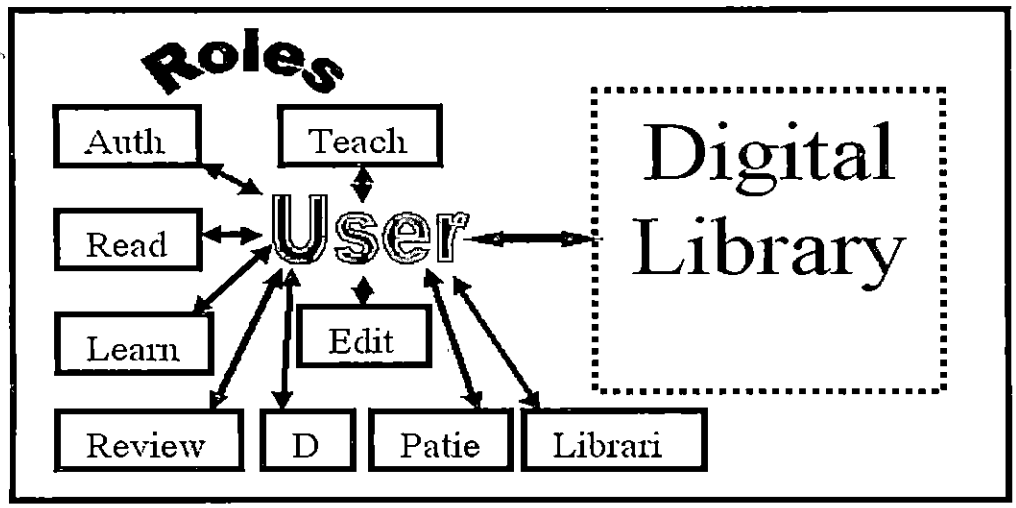
Linking, Annotating, and Browsing

Once a DO is found, it often is appropriate to follow links from it to cited works (or vice versa). Further, notes can be recorded as annotations and linked back to the works, so they can be recalled later or shared with colleagues as part of collaborative activities. If suitable clustering is in place, other DOs that are "near" a given work may be examined. Or, using a classification system appropriate for the content domain, users may browse around in "concept space" and link at any point between concepts and related DOs. Browsing also can proceed based on any of the elements in the MDO. Thus, dates, locations, publishers, contributing artists, language, and other aspects may be considered to explore the collection or refine a search.

Interfaces and Interaction

Ultimately, users will connect through a human-computer interface and interact with the digital library, though in some cases the digital library may be an embedded system that is seen only indirectly (e.g., through a word processor that allows one to search for a quotation). Most commonly, a digital library has an interface for users to search, browse, follow links, retrieve, and read documents. As can be seen in Figure

4, that interface may be specialized according to what roles the user will play.



Major process

- Collection
- Storage
- Organization
- Distribution

Digital Collection

- **E-journals**
- **E-books**
- **Electronic databases**
    - Newspapers
    - Full-text articles
    - Reference materials
- **Conversion from printed materials**

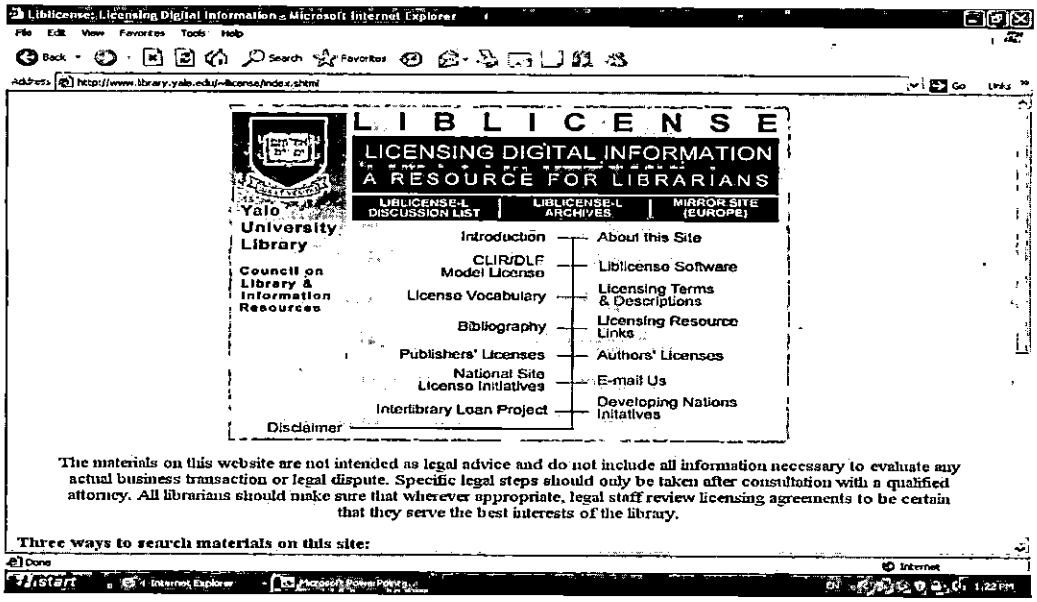
Copyright/licensing

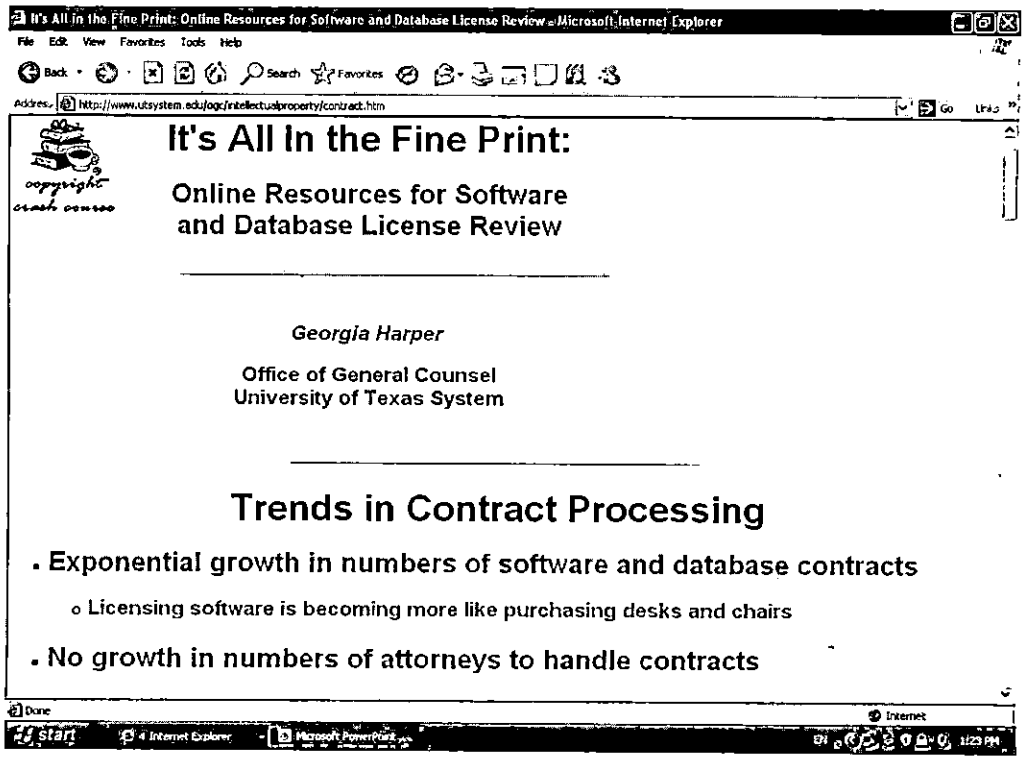
- Copyright issues
- Copyright versus fair use
- Licensing agreement
    - Licensing Digital Library: A resource for librarian

http://www.library.yale.edu/~llicense/index.shtml

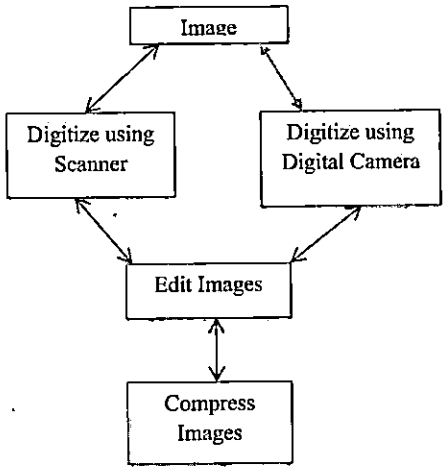
Online resources for software and database license review

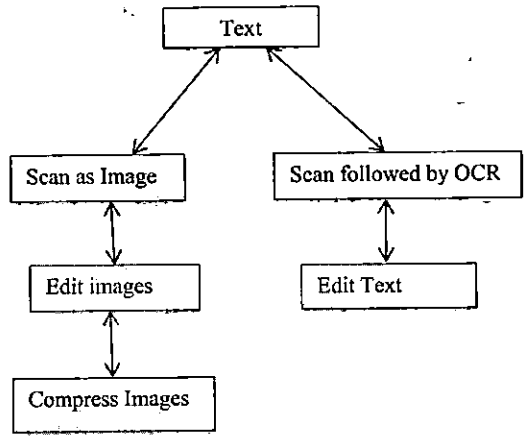
http://www.utsystem.edu/ogc/intellectualproperty/contract.htm





Digitalization:





Equipment needed:

- Conversion devices
- Conversion and editing software
- Storage devices
- Display devices
- Output devices

Special Collection:

- **Types**
  - Maps
  - Music
  - Videos
  - Graphical items
  - objects
- **Special requirements for conversion**
- **A supplement not a substitute**

Organization:

Indexing

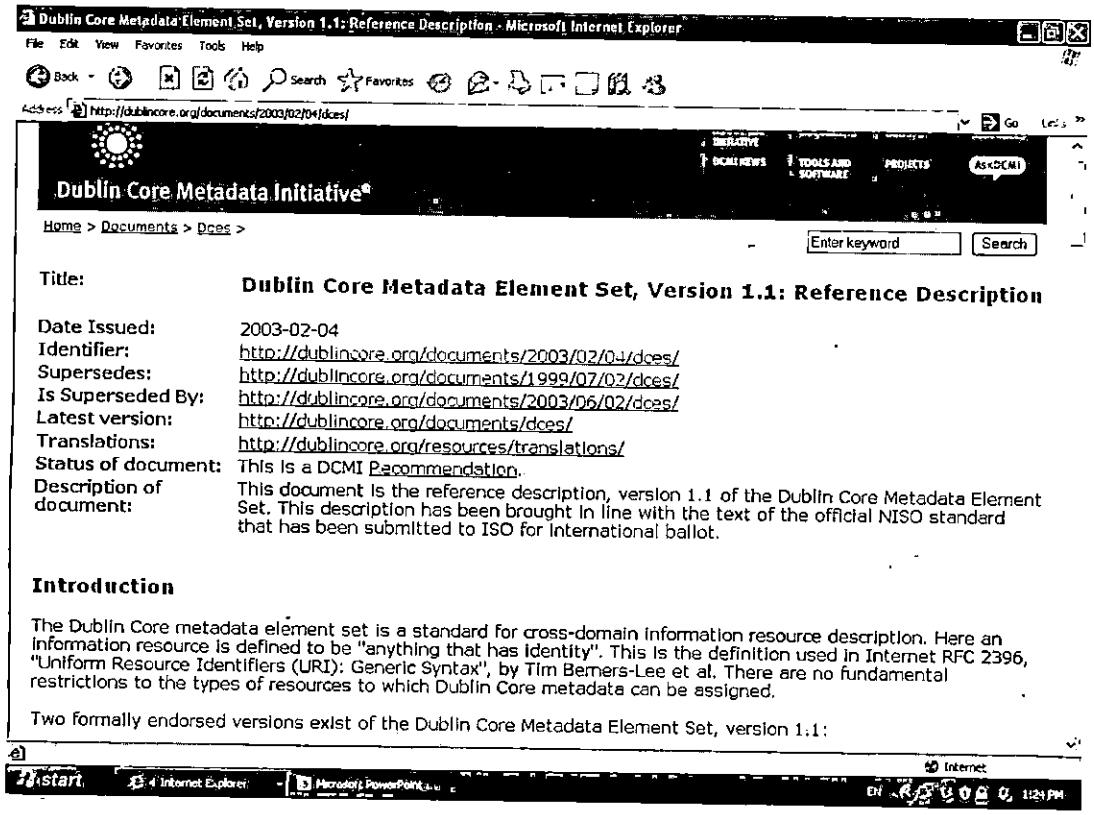
- Text indexing
- Image indexing

- Multimedia indexing
- Multiple language documents indexing

4. Metadata:

The process at Digital library is metadata centric. Every book that is scanned and stored is associated withmetadata for identification and search and retrieval. Metadata, or "data about data," is a critical element for searching information through a database especially, when theinformation available in an invisible space like the Internet, unlike a conventional library. Metadata are also types ofdescriptive information applied to a digital spatial file.

http://dublincore.org/documents/2003/02/04/dces/



Elements of Dublin Core:

Name	Identifier	Definition	Comment
Title	Title	A name given to the resource	Typically a Title will be a name by which the resource is formally known.

Creator	Creator	An entity primarily responsible for making. the content of the resource.	Examples of a Creator include a person, an Organization or a service. Typically, the name of a Creator should be used to indicate the entity.
Subject and Keywords	Subject	The topic of the content of the resource.	Typically, a Subject will be expressed as keywords, key phrases, or classification codes that describe a topic of the resource. Recommended best practice is to select a value from a controlled vocabulary or formal classification scheme.
Description	Description	An account of the content of the resource.	Description may include, but is not limited to: an abstract, table of contents, reference to a graphical representation of content or a free-text account of the content
Publisher	Publisher	An entity responsible for making the resource available.	Examples of a Publisher include a person an organization, or a service. Typically, the name of a Publisher should be used to indicate the entity.
Contributor	Contributor	An entity responsible for making contributions to the content of the resource.	Examples of a Contributor include a person, an organization, or a service. Typically, the name of a Contributor should be used to indicate the entity.
Date	Date	A date associated with an event in the life cycle of the resource.	Typically, Date will be associated with the creation or availability of the resource. Recommended best practice for encoding the date value is defined in a profile of ISO 8601 [W3CDTF] and follows the YYYY-MM-DD format.
Resource Type	Type	The nature or genre of the content of the resource	Type includes terms describing general categories, functions, genres, or aggregation levels for content. Recommended best practice is to select a value from a controlled vocabulary (for example, the working draft list of Dublin Core Types [DCT1]). To describe the physical or digital manifestation of the resource use the Format element.

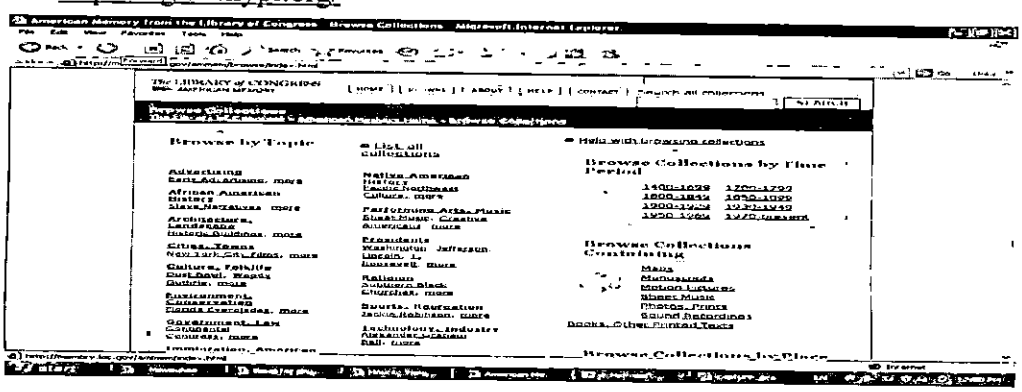
Format	Format	The physical or digital manifestation of the resource.	Typically, Format may include the media type or dimensions of the resource. Format may be used to determine the software hardware or other equipment needed to display or operate the resource. Examples of dimensions include size and duration. Recommended best practice is to select a value from a controlled vocabulary (for example, the list of Internet Media Types [MIME] defining computer media formats).
Resource Identifier	Identifier	An unambiguous reference to the resource within a given context.	Recommended best practice is to identify the resource by means of a string or number conforming to a formal identification. System. Example formal identification systems include the Uniform Resource Identifier (URI) (including the Uniform Resource Locator (URL)), the Digital Object Identifier (DOI) and the International Standard Book Number (ISBN).
Source	Source	A reference to a resource from which the present resource is derived.	The present resource may be derived from the Source resource in whole or in part. Recommended best practice is to reference the resource by means of a string or number conforming to a formal identification system.

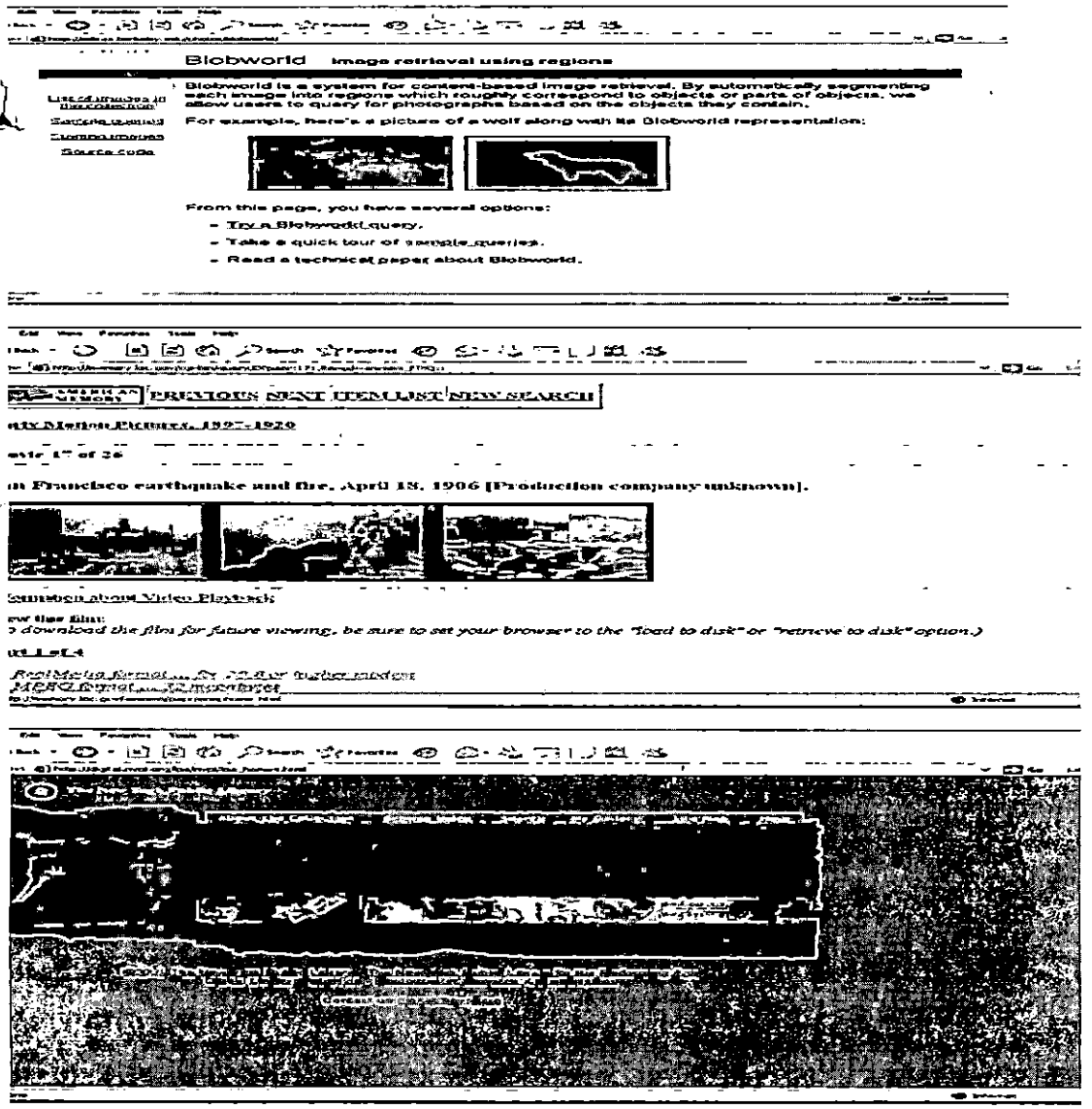
Language	Language	A language of the intellectual content of the resource.	Recommended best practice for the values of the Language element is defined by RFC 1766 [RFC1766] which includes a two-letter Language Code (taken from the ISO 639 standard [ISO639]), followed optionally, by a two-letter Country Code (taken from the ISO 3166 standard [ISO3166]). For example, 'en' for English, 'fr' for French, or 'en-uk' for English used in the United Kingdom.
Relation	Relation	A reference to a related resource.	Recommended best practice is to reference the resource by means of a string or number conforming to a formal identification system.
Coverage	Coverage	The extent or scope of the content of the resource.	Coverage will typically include spatial location (a place name or geographic coordinates), temporal period (a period label, date, or date range) or jurisdiction (such as a named administrative entity). Recommended best practice is to select a value from a controlled vocabulary (for example, the Thesaurus of Geographic Names [TGN]), and that, where appropriate, named places or time periods be used in preference to numeric identifiers such as sets of coordinates or date ranges.

Rights Management	Rights	Information about rights held in and over the resource.	Typically, a Rights element will contain a rights management statement for the resource. Or reference a service providing such information. Rights information often encompasses Intellectual Property Rights (IPR), Copyright, and various Property Rights. If the Rights element is absent, no assumptions can be made about the status of these and other rights with respect to the resource.

Examples of Digital Libraries

- American Memory from the Library of Congress
  http://lcweb2.loc.gov/ammem/ammemhome.html
- University of California at Berkeley
  http://elib.cs.berkeley.edu
- Internet Public Library
  http://www.ipl.org
- New York Public Library
  http://digital.nypl.org/





5. Conclusion

When creating digital library systemscontaining valuable content, we aremaking important promises to bothcurrent and future users. Seriouslyattending to the principles discussedhere and to the practices that evolvefrom them places us in a much betterposition to keep these promises. Valuablecontent should be handled withcare and rendered in the highest qualitypossible. Valuable content shouldnot disappear. We need to understandhow to preserve and safeguard digitalmaterial,

so it doesn't become obsoletesimply because we didn't pay attention. Finally, we need to strive for continuedopen access to all knowledge.There is no better time to start thannow and no better place to start thanwith our own valuable collections.

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13. http://etext.lib.virginia.edu; http://jefferson.village.virginia.edu, as of 27 May 2004.
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DIGITAL LIBRARIES: An Overview

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Dr. Naresh Kumar

Abstract: During the past recent years, there has been tremendous development in the concept of digital libraries. It is a knowledge base library that can be stored and retrieved information through online network. Digital libraries are the most form of information system that supports digital document preservation, distributed database management, Information retrieval and selective dissemination of information. This has really overcome geographical barrier offering the wide range of academic, research and culture resources with multimedia effects which can be accessed around the world over the distributed networks. This paper examines the concept of digital library, its function, effect of digitalization and its merit and demerits.

Keywords: Digitalization, predominant, Metadata

1. Introduction:

Advance development in information technologies has given birth to the digital libraries. As a result, a traditional library faces new challenges, demands, and expectations. They are redesigning their services and information products to add value to their services and to satisfy the information needs of their user. Traditional libraries are still handling largely printed materials that are expensive, bulky and difficult to use. Information seekers are no longer satisfied with only printed materials. They want the supplement of printed information with more dynamic form. Demands for digitization are required and increasing day by day.

Digital libraries will start gaining ground in India in the present century. We are heading toward an environment of digital information. A library's existence does not depend only on the physical form of documents. Its mission is to link the past and the present, and help to shape the future by preserving the records of human culture. But a library is facing many problems when we digitalized it. One issue might be how to digitize the object and put them online. Second might be how to include new forms of information. One another is how to locate material in the digital, how to use and when to use information material. This framework presents for thinking about the digital libraries and research issues that affect digital library system. But the modern decade have tremendous advanced facilities

and applications. The latest technologies offer cheaper price computer processing power, mass storage inexpensive access to high speed network and retrieval devices. Which gives us the ability to create, manipulate, store and transfer large quantity of information at low cost.

2. What are Digital Libraries?

As we all know that this is a computer era. So, we can say that digitalization means part of computerization. In digital library, collections are stored in digital formats and accessible with the help of computers. The content may be stored locally, or accessed remotely. In other words digital library is a collection of digital documents or objects. The focus of this library is on the document collection, it stresses the fact that the digital libraries are much more than a casual assembly of digital objects. They hold the several qualities of traditional libraries such as a defined community of users, focused collections, long-term availability of documents, and the possibility of selecting, organizing, preserving and sharing resources. The digital libraries are sometimes apparent as institutions. A digital libraries evolve and become the predominant mode of access to knowledge and learning, institutionalization of digital libraries appears to be on the increase. In other words we can say that digital libraries have special focus on digital document as compare to printed material and it also provides facilities to its information users to use the resources appropriately. They also need digitalized staff for this purpose.

3. Definitions:

According to **Digital Library Federation**," An Organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to interprets, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily available for use by a community or set of communities."

According to **Don Waters,** "Digital libraries are organizations that provide the resources including the specialized staff, to select, structure, offer intellectual access to, distribute, preserve the integrity of and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities".

4. Need and Purpose:

There are many reasons why one might want digital libraries.

- The digital libraries make research easier for scholars. They provide related data to the scholars, which is helpful for them in research.
- They might ease the budget pressures on libraries because digital material is available at cheapest cost as compare to the printed material and many users can use one document at the same time.
- They might solve our increasingly urgent preservation problems.
- They might help libraries extend collections into new media and attract the large no of users.
- They also save the time of the user by providing different services.
- Expedite the systematic development of procedures to collect, store, and organize, information in digital form.
- Promote efficient delivery of information economically to all users.
- Encourage co-operative efforts in research resource, computing, and communication networks.
- Strengthen communication and collaboration between and among educational institutions.
- Take leadership role in the generation and dissemination of knowledge

This will depend on how we fund, regulate, and manage digital libraries, the new communications infrastructure and the new technologies which drive them.

5. Characteristics of Digital Libraries:

The characteristics of Digital Libraries are discussed below:-

- Users are usually elsewhere than the information they want and often wish to correlate things from several sources.
- Whoever wants to use a library must show permission to do so.
- Different patrons are permitted different actions and to see different parts of each collection.
- To find specific information, each user must understand the catalogue structure.
- Documents contain cross reference to other documents.
- The Catalogue may describe items not actually held as part of the collection at hand.

- Digital Libraries are the digital face of traditional libraries that include both digital collections and traditional collections. So they encompass both electronic and paper materials.
- These Libraries will also include digital materials that exist outside the physical and administrative bounds
- They will include all the processes and services that are the backbone and nervous system of libraries.
- They ideally provide a coherent view of all of the information contained within a library, no matter its form or format.
- They will serve particular communities or constituencies.
- Digital Libraries will require both the skills of librarians and well as those of computer scientists to be viable.
- These libraries bring closer to the users The Information are brought to the users, either at home or work, making it more accessible, and increases its usage. This is very much different than traditional libraries where the users have to physically go to the library.
- Computer technology is used for searching and browsing. Computer systems are better than manual methods for finding information. It is useful for reference work that involves repeated leaps from one source of information to another.
- Information can be shared. Placing digital information on a network makes it available to everyone. Many digital libraries are maintained at a single central site.
- This is a vast improvement over expensive physical duplication of little used material, or the inconvenience of unique material that is inaccessible without traveling to the location where it is stored.
- Information is always available: The digital library's doors will never close; usage of digital libraries' collections can be done at hours when the library buildings are closed. Materials are never checked-out, missed-shelve, or stolen.
- New forms of information become possible: A database may be the best way torecord and disseminate information. Whereas conventional libraries are printed onpaper, yet print is not always the best way to record and disseminate information.

6. Function of Digital Library

- Access to large amounts of information to users wherever they are and whenever they need it.
- Access to primary information sources.

- Support multimedia content along with text
- Network accessibility on Intranet and Internet
- User-friendly interface
- Hypertext links for navigation
- Client-server architecture
- Advanced search and retrieval.
- Integration with other digital libraries.
- Emphasizes on organization, acquisition, preservation, and utilization of information.
- Need specific hardware, networking, and software situations for proper utilization.

7. Components of Digital Library

In operational terms, however, many digital libraries are built out components that are integrated into a production quality of system. Figure 1.0 highlights some of the most important such components of digital library.

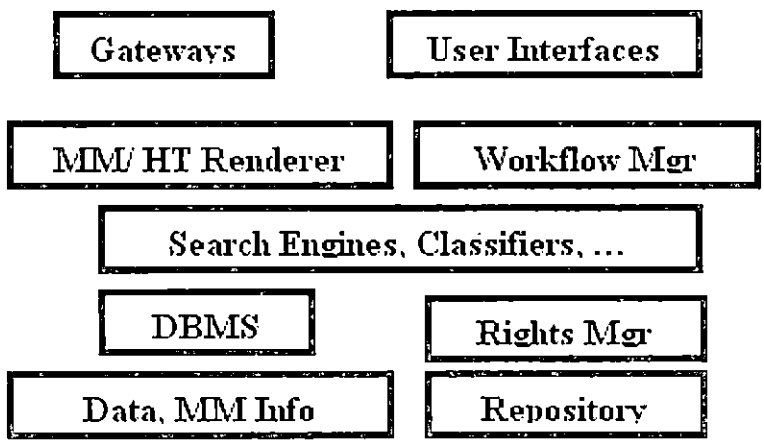


Figure 1. Components of a Digital Library

In the following subsections we explore issues and sub-components related to this figure.

Digital objects

The actual content of digital libraries is the collection of digital objects. In this the information is available in digital form such as a table of results and genomic

information of an individual. Information is not only limited in table form but available in multimedia form such as an image, graphic, animation, sound, musical performance, or video. In this form the documents carries content. Some of the objects will be "born digital", such as this paper, while others may be representations of some physical object (such as a painting that is shown through a digital image) which is the result from some type of digitization process. Thus, in future, digital libraries will be hybrid constructs, where paper, microforms, and other media carry much according to the interest of the users and metadata is also available in digital form.

Metadata

Digital objects are described, structured, summarized, managed, and manipulated through the use of "metadata", which literally means data about data. Three types of metadata are often distinguished: descriptive, structural, and administrative. Metadata is usually produced through a process called "cataloging" which is often carried out by trained librarians. Collections of such information are commonly stored in "catalogs". In computerized environments, metadata may be automatically or semi-automatically extracted or derived from the original content, or the "full-text .If only metadata is available in computer form to describe a digital object, it must be used in digital libraries. Thus metadata should be used in a digital library and it is an important aspect in many such systems.

Rights Management

Right management is helpful to To do the work of digital library smoothly we follow some steps which were helpful in the working of the library such as

- The digital library should include policies and rules specifying the management required.
- The users of the digital library should be authenticated in some way so they are known.
- The content of the digital library should be shown to be authentic.
- Payment should be made if access requires that in a particular case.
- Users who are authorized to access a DO are allowed to do so.
- Subsequent access with the DO may take place after retrieval to a user's site.

Interfaces and Interaction

Ultimately, users will connect through a human-computer interface and interact with the digital library. In some cases the digital library may be an embedded system that is seen only indirectly (e.g., through a word processor that allows one

to search for a quotation). Most commonly, a digital library has an interface for users to search, browse, follow links, retrieve, and read documents. As can be seen in Figure 4, that interface may be specialized according to what roles the user will play.

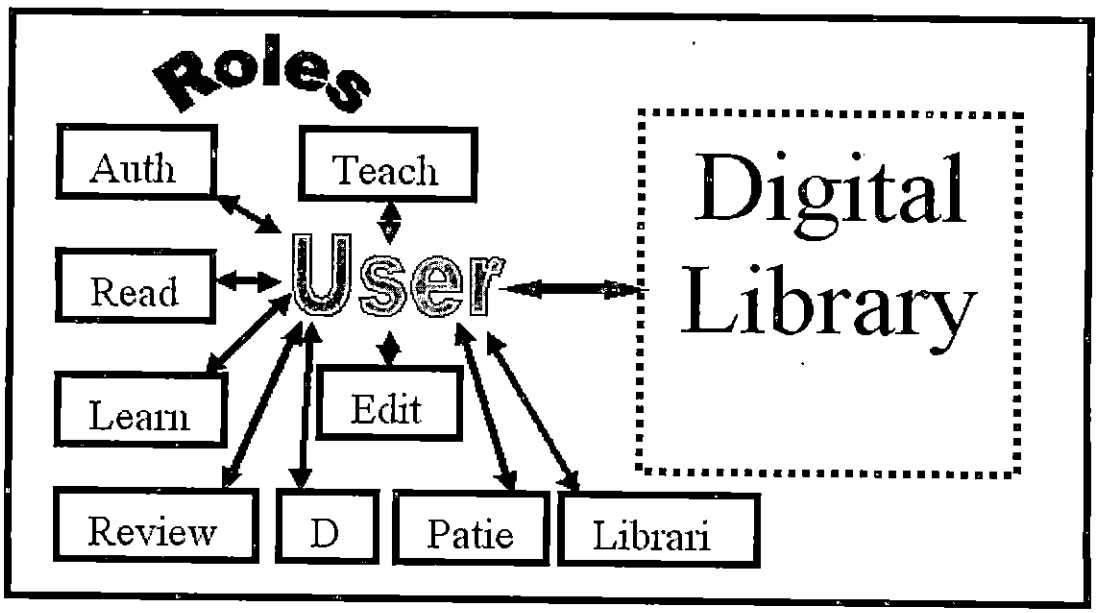


Figure 2. Users Direct

As you can see in the figure 2 that the users of any digital library use the data according to his requirement and edit the data according to his need.

8. Hardware Requirement:

Some hardware requirements of digital library are

- 24 hours Internet connectivity
- Computer server
- LAN and WAN Service
- Scanners
- Storage media : high power hard disk
- Wi fi tower
- CDs and DVDs
- Digital camera

- High power ups
- Networks
- Multimedia interfaces

Software:

The software requirement of digital library are given below

- Linux operating system
- Digital library software like Green stone and D-Space
- Editing software

Human ware:

The key skills are required for digital library staff are indicated below:

- Management skills
- Technical skills
- Subject Skills

Objectives of Digital Library:

The main objectives of digital libraries are given below

- Provide current library materials and databases that support the academic curriculum
- Provide access to information resources, irrespective of location
- Collect library materials in all formats and update all collections to meet the needs of the users and support the various aspects of the institution: teaching, training, research and services
- Educate and assist students and staff for the effective use of information resources
- Continue to strengthen and update all collections to meet the requirement of the users.
- Preserve material to maintain and upgrade the physical and technological infrastructure to improve the quality of services
- Meet or exceed the service standard
- Access library resources and servers via web pages and online recourses
- Ensure that resources available are current appropriate and accessible to the users twenty four hour in seven days.
- Work closely with users; so that you should know their needs and interests
- Put into practice the motto that building library resources is a continuous process.

- Save the time of the library staff by avoiding routine jobs
- To minimize massive storage and space problem of large libraries.
- Try to reduce the cost involved in various library activities.

9. Future Digital libraries

- The organization in digital libraries will take the need of cooperation. Long ago, libraries gave up the idea that every library had to do its own original cataloguing for every book it and cooperative cataloguing was born. In the same way, there is no reason why every library is digitalized and needs to be cataloguing the same electronic resources. In this spirit, the IPL has recently agreed to join forces with other like-minded projects, such as the Librarians' Index to the Internet content available on the Internet.
- We also need to think of new ways to organize digital information as it is growing exponentially day by day and our organizational schemes will need to grow and change along with the content.
- Cooperative digital reference services are already forming in the libraries. The next service in digital libraries will be to explore the ways in which digital reference can be partially automated. Although we need a good software for this purpose which will be able to navigate the complexities of library reference on its own. It is possible only when a software is intelligently designed and it can assist librarians by routing questions. Other types of services that need to be explored in the digital libraries are advisory translate service which will helpful for the readers
- Earlier the future of digital materials in libraries seemed to be certain: full text databases are available in libraries and accessed by librarians at the request of the users. Just one year later, the first graphical browser for the World-Wide Web, was introduced, and the world of digitalization has been changed. Libraries are able to get digital material from internet.
- Today digitalization is an important part of our life. I am happy then when I will see that students are growing up in the world of information and become information technology as a part of their everyday lives it is then when we will finally be able to take the full advantage of digital libraries.

10. Digital Conversion Process

Digital conversion process, which includes

Document

Data Collection

Processing of Data

Storage of Documents

Indexing and Processing of Document

Retrieval and Display of Information

11. Advantages of Digital Libraries

- The main advantages of digital libraries are as follow:-
- Digital Library provides a starting point for all researches.
- Provide excellent opportunities for the patrons to find appropriate research material at one place.
- Digital libraries can be customized so user can have to access what they want.
- Help in resource sharing facilities.
- Saves the library manpower and funds.
- Help in inter library loan
- Save the time of the users.
- An exact copy of the original can be made any number of times without any degradation in quality.
- It minimizes the duplication of new invention.
- Helps to get bibliographic information, Union Catalogue, Abstracting and Indexing of periodicals.
- E-Publication provides bibliographic details of millions of books and details about their resources.
- The Librarians has a full control over the selection of document.
- E-Publication can provide up to date information to their buyer so that the user are able to purchase the latest version of the publication
- Teach the users about the new technology and aware them how to use it.
- A particular digital library can provide the link to any other resources of other digital library very easily
- Same resources can be used at the same time by a number of users.

12. Disadvantages of Digital Libraries

Digitizing information is no doubt helpful in great deal but there are some problems which we are handing by using digitalized Information. Digital Libraries have their own limitations. Some of the m are given below:-

- Access in an equity Issue.

- Enough and useful but so many resources are available.
- The infrastructure cost of digital library i.e. the cost of hardware, software; leasing communication circuit is generally very high.
- Larger volume of digital information make difficult to find the right material on right time.
- As more and more computer are connected to the Internet its speed of access reasonably decreasing.
- Problem in the scholarly publishing.
- Locating information on the internet requires good skills.
- Some documents are used only when they are seen.
- The unrelenting invasion of viruses will pose another ethical risk.
- Many people also find reading printed material to be easier than reading material on a computer screen.
- Digitization break up the copy right law as the thought content of one author can be freely transfer by other without his acknowledgement.
- Eye and back problems as well as the exposure of radiation from monitor effect the health of the users.
- Due to technological developments, a digital library can rapidly become out-of-date and its data may become inaccessible.
- Reading in digital libraries require more concentration than traditional libraries.
- Powerful search engines and more hard ware material is required.
- Infrastructure used for digitalization is very expensive

13. Recommendations for Institutions

- Be clear about the purpose of the project
- Begin with a clear understanding about whether or not the library will maintain the surrogates and for how long.
- Develop clear protocols for selection decisions.
- Develop cost projections for all aspects of digital conversion, from selection to refreshing of files.
- Either focus on materials that are already organized or target materials not under intellectual control.
- Work with faculty and scholars to develop controlled vocabularies in those fields lacking them, to aid in creating metadata.
- Clarify the target on audience collection: do not attempt all things to all

audiences..

- Secure funding for and conduct user assessments of digitized collections
- Consider making metadata available for harvesting through the Open Archives Initiative protocol.
- Design a Web site that is graphically clear and easy to navigate; update it frequently as appropriate.
- Develop a policy for the disposition of reformatted materials

14. Conclusion:

In above paper we discussed the importance of digitalization, why we need it and what the purpose of digitalization is. We also pointed out which pattern we have to follow to digitalize our library and what are the function played by such kind of libraries. We also enumerated the merits and demerits of digital library with high point of view. What are the factors that effects the technology and what are the problem faces by a digital library in his present stage. But after that we have many advantages of this digitalization technology. High Technology capture and sophisticated the powerful search engine which is helpful for institutes, colleges and Universities and after for the common man

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Digital Library Practices in Bangladesh: A Study on Some Selected Libraries

Dr. Md. Shariful Islam, Md. Uzzal Hossain, Md. Nazmul Islam and Md. Ede Amin

Abstract: The paper presents the results of digital library practices and overall condition of library digitization activities in Bangladesh. The paper also explores users' perception with the digital library activities in Bangladesh. It endeavors to identify the impacts of digital libraries to the users. The paper tries to point out the barriers towards digital libraries in Bangladesh and finally the paper offers suggestive measures for overcoming the existing problems and for the development of digitization programme in the libraries of Bangladesh.

Keywords: Digital library, digital library software, search techniques, search engines, digital library impact.

1. Introduction

Computer application has brought a great change in the field of library and information services. Libraries are always trying to cope up with the new technologies. Today's libraries are not only confined to organize information but also disseminate knowledge and information in an effective way. The advent of computer technologies and Internet has revolutionized the activities of information creation, organization, presentation and scholarly communication. The immense ability of these technologies is to access, interpret and create digital information has increased. This changing wind is also pushing the libraries and information centers in Bangladesh in adopting the recent technologies and digital technologies and digital information resources to make the library services up to date (Alam and Islam, 2011). Digital libraries preserve and retrieve electronic information effectively and disseminate it in a wide variety of digital information system. It helps to the information seekers to get their desired information through a digital library. Digital libraries have a great importance to ensure information from anywhere through the Internet. The users in a digital library may fulfill his/her demand without visiting the library physically.

The concept of digital library in Bangladesh is not so familiar, even this concept is not so clear to the library users in Bangladesh. Digital libraries in the developed countries started during the 1970s. But in Bangladesh; probably it began in the mid-1980s with the installation for library automation system. In 1993, Internet revolution has made a good way for digital library development in Bangladesh (Rahman, 2012). The digital library system in Bangladesh is at elementary level. Some special libraries and leading private university libraries are trying to introduce their libraries with digitization. Digital library practice in Bangladesh is gaining popularity in the recent decades. The public and private university libraries and some special libraries in Bangladesh are

comparatively familiar with digital library activities. Considering the benefits and demand of digital libraries the users of the digital libraries are increasing day by day.

2. Objectives of the study

The general objective of this study is to investigate the status of digital library practices in public and private university libraries and also some special libraries in Bangladesh. Besides, the special objectives of the study are:

i. To know the ICT-based resources and facilities provided by the surveyed libraries;
ii. To compare the digital services provided by the libraries;
iii. To identify the impacts of digital libraries to the users;
iv. To identify the satisfaction level and perception of the library users with digital library;
v. To find out the problems hindering in digitization practices in Bangladesh; and
vi. To offer recommendations for overcoming the existing problems and for the development of digitization programme in the libraries of Bangladesh.

3. Research questions

To meet the above objectives, this study has generated the following research questions (RQs):

i. What is the status of ICT-based resources of the selected libraries and what facilities are provided by the libraries?
ii. Which of the digital library services are provided to the users and what is the level of satisfaction with digital library services?
iii. For what purposes the users used the digital library and what are their satisfaction levels with digital library?
iv. What are the problems that hinder digitization in the libraries of Bangladesh?

4. Review of related literature

A lot of studies have already been carried out on digital libraries in Bangladesh. Some of the outstanding works are:

Roknuzzaman (2003) in his paper "Trends in Digital Libraries: a theoretical exercise" tried to deal with the conceptual framework of digital library system. He also identified the challenges of digital library and professional requirement to cope with the digital challenges. This study provided an overview of digital library trends in the perspective of Bangladesh. Reza (2006) in her paper "Problems and prospects of digital library and library digitization in Bangladeshi institute for higher education" focused on the present status of higher education institute with digitization activities and the problems of library digitization on the aspects of Bangladesh. She provided with suggestive measures against the problems of library digitization in Bangladesh. Islam (2011)"source":"eprints.rclis.org","event":"World Congress of Muslim Librarians and Information Scientists","event-place":"Selayang (Malaysia in his paper "Towards digitization: problems and prospects for the libraries of Bangladesh" focused on recent updates of digitization activities and tried to identify problems of digitization activities. This paper revealed most of the libraries are far behind from any sort of digitization effort to their library. Alam and Islam (2011) in their paper on "Digital Library Initiatives in Bangladesh: Current Status and Future Challenges" focused on the initiatives of digital library trends and some challenges of digitization. Islam (2013) in his paper "Library Digitization in Bangladesh: A Developing Country Perspective" focused on the practical necessity of digitization to access improved information services and digitization helps to narrow down the digital divide. It showed the digitization trends and tried to identify some barriers of library digitization. Shuva (2014) "URL":"https://www.academia.edu/7542928/Are_University_Libraries_in_Bangladesh_Ready_to_be_Digital","author":[{"family":"Shuva","given":"Nafiz Zaman"}],"accessed":{"date-parts":[["2016",4,30]]}}],"schema":"https://github.com/citation-style-language/schema/raw/master/csl-citation.json"} conducted a study on "Are university libraries in Bangladesh ready to be digital?" The core purpose of the study was to find the existing status of digital libraries (DLs) in university libraries of Bangladesh and to see whether university libraries of Bangladesh are ready to convert their traditional libraries into digital ones. This study further illustrated the government initiatives on digitization development. Kolly (2014) in her study entitled "Status of digital libraries in medical university and colleges in Bangladesh" focused on digitization activities in medical libraries. It also investigated on ICT-based activities for digital library and digital library project in Bangladesh.

Tabassum, Roknuzzaman and Islam (2015) conducted a recent study entitled "Usages of digital library system at a private university library in Bangladesh." They tried to show the usefulness of a private university library with the digital system. They identified library users should be aware about using the digital library, requires trained manpower, infrastructural facilities should be improved, governments attention is required for adoption of digital library in Bangladesh. A more recent study on "Present Status of Digital library initiatives in Bangladesh" conducted by Islam and Naznin (2015). They tried to provide the existing scenario of digital library initiatives in Bangladesh. They

also identified the services and facilities provided by the digital libraries in Bangladesh and tried to find out the pre-requisites of a successful digital library. They further determined the main challenges of handling digital libraries in Bangladesh and provided their probable solutions to overcome the problems for improving the digital libraries of Bangladesh.

The related literature helped to establish a sound investigation on digital library practices and tried to identify possible responses to the research questions for the work, which investigate digital library practices in public, private university libraries and special libraries in Bangladesh.

5. Research Methodology

A total of twelve leading libraries [four public university libraries namely Dhaka University Library (DUL), BUET Central Library (BUETL), Sher- e-Bangla Agricultural University Library (SBAUL), Rajshahi University Library (RUL), four private university libraries namely East West University Library (EWUL), BRAC University Library (Ayesha Abed Library), North South University Library (NSUL), Independent University, Bangladesh Library (IUBL) and four special libraries namely Archer K. Blood Library (US Embassy Library) (AKBL), BANSDOC Library, Bangladesh Parliament Library (BPL) and UNIC Library)] were purposefully selected for this research. The data were collected through survey method from the selected libraries. A structured questionnaire was designed for collecting data. A total of 150 library users were selected for interviews using simple random sampling. A total of 115 valid questionnaires were collected accounting for 76.66% response rate.

6. Status of Digital Libraries in Bangladesh

Libraries in Bangladesh started using computers only in the 1980s. The International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) Library and the Agricultural Information Centre are considered pioneers in introducing automation activities in Bangladesh (Khan, 1989). University of Dhaka, the largest and oldest public university in Bangladesh, set up an IR (http://repository.library.du.ac.bd/xmlui/) using Dspace in early 2013, although library automation was instituted at the University of Dhaka in 1998 with support from UNDP. Bangladesh University of Engineering and Technology library was established in 1962. Bangladesh University of Engineering and Technology (BUET) has a project titled "Digitalization of Central Library of BUET". This project commenced in April 2012. The library hosts a diverse collection of books, journals, monograms and periodicals of academic interest. Sher-e-Bangla Agricultural University is the oldest agricultural institution in Bangladesh and South Asia. It subscribes to JSTOR, HINARI, AGORA, OARE, Oxford Scholarship Online, Pearsons and it has an institutional repository. Rajshahi university library has the Dspace soft-

ware with all the features. Recently the library has set up RFID based library management system.

Among the private university libraries, BRAC university library started digital institutional repository in June 2008. It established digital institutional repository using open source software Dspace. It currently contains about 1,700 collections. BRAC library is a fully automated library, which provides an OPAC and few other digital library facilities like subscription of internationally published e-journals such as HINARI, AGORA, JSTOR, DOAJ, PUBMED. North South University (NSU), the first private university in Bangladesh, instituted its Institutional Repository in 2003. The library has their own software for online system named NSU Library Management System (NSU-LMS). East West University, another leading private university, in Bangladesh built its DL system using Greenstone. The East West University is the first to introduce the Greenstone DL software in Bangladesh, and is working as the country contact for the Digital Library Network South Asia (DLNETSA) (Nafiz, 2014). To keep pace with modern IT based world, the East West University library developed unique indigenous library software namely East West University Library Management Information System (EWULIBMIS) to support and manage various library activities (Tabassum, Roknuzzaman and Islam, 2015). Independent University of Bangladesh library has a digital repository. The library subscribes to following host of e-journals; AOM, ACM, ACS, CUP, E-journals.org, IEEE, JSTOR, OUP, Project MUSE, ScienceDirect, etc.

Among the special libraries, The BANSDOC (Bangladesh National scientific and Technical Documentation Center) was established in 1962. The library started it digital activities in 2009. It also subscribes Agora and Hinari to meet the user requirement. United Nations Information Center, Dhaka is an organization of United Nations Information established its office at Dhaka in 1981. The American Center, U.S. Embassy Dhaka has a library with providing timely, reliable and comprehensive information on the United States: literature and culture, politics and government, economics and trade, and foreign affairs and defense. The Library also provides Online Public Access Catalog (OPAC) service. UNIC library is situated in Agargaon, Dhaka. The library is not locally digitized but it maintains its digital activities and e-resource services through its Headquarters library. Bangladesh Parliament Library was established in 1972 to serve the library services to the parliament members of Bangladesh. This library is trying to involve with the digital environment.

7. Library Digitization Practices in Bangladesh

Status of library digitization

In Bangladesh, all the libraries are not fully digitized. The study shows that 8.33% libraries are fully digitized and 8.33% libraries are at the initial level of digitization. On the other hand most of the libraries (83.33%) are partially digitized.

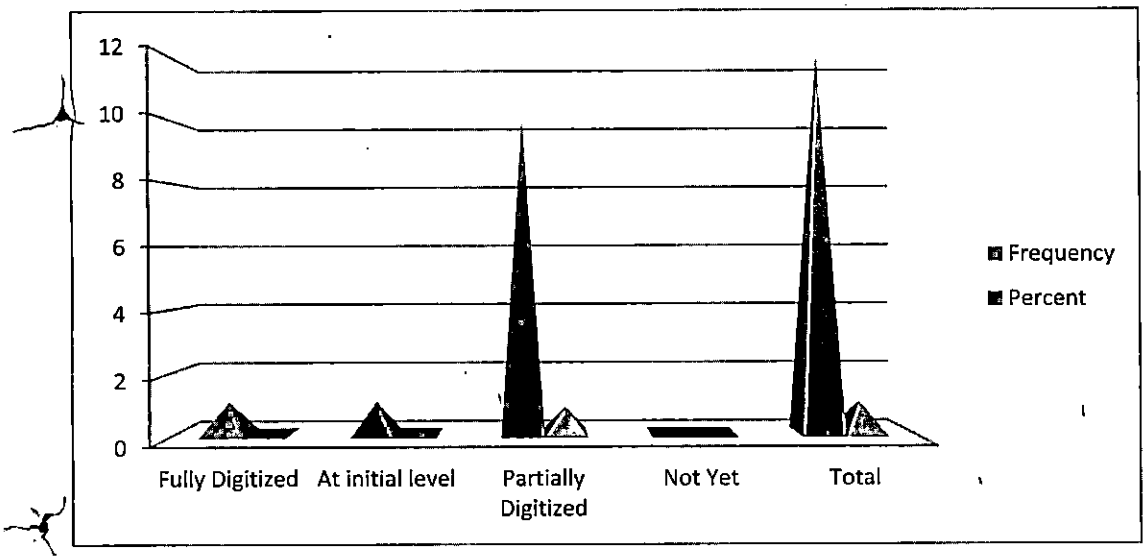


Figure 1: Status of library digitization

8. Digital library services to users

The researchers tried to find out which of the digital library services were provided by the surveyed libraries. Table 1 shows that e-book services and e-journal services are rendered by all the sample libraries.

9. ICT-based resources in the sample libraries

The ICT-based resources help a library to be digitized. The BUET and IUB library has all the ICT-based resources to render services to the users. Rajshahi university library provides e-book with titles. Table 2 depicts the ICT- based resources of the surveyed libraries.

Table 1: Digital library services to users

Digital library services	Public University Libraries				Private University Libraries				Special Libraries			
	DUL	RUL	SBAUL	BUETL	EWUL	BRACUL	IUBL	NSUL	UNICL	BANSDOCL	AKBL	BPL
e-Book												
e-Journal												
CDS /DVDs												
Cassettes												
e-Thesis												
Institutional repository												

=Indicates that the services provided by the library

× = Indicates that the services did not provide by the library

Table 2: ICT- based resources in the sample libraries

Name of the Libraries	ICT-based information resources						
	Computer	Connected to Internet	E-books	CD-ROM	Audio -Cassettes	Video-Cassettes	Photocopier
DUL	130	130	30000	-	-	-	9
BUETL	90	90	8000	2500	100	100	10
SBAU L	100	100	600	-	-	-	2

RUCL	50	50	29858 (Titles)	2	-	-	2
BRACUL	46	46	70848	400	-	-	1
EWUL	32	32	95000	1500	-	-	2
NSUL	70	70	105328	1900	159	229	1
IUBL	75	75	12439	2949	162	377	2
BANSDOCL	10	10	394	120	-	-	2
AKBL	13	13	20000+	-	-	-	1
BPL	35	35	-	-	-	-	3
UNICL	4	4	100	200	1000	100	1

Data analysis and interpretation

Gender profile of the respondents

A total 115 respondents were taken part under this survey, out of them 84 respondents were male and 31 respondents were female. The pie chart shows the sex distribution of the respondents, i.e. 73.04% were male and 26.96% were female.

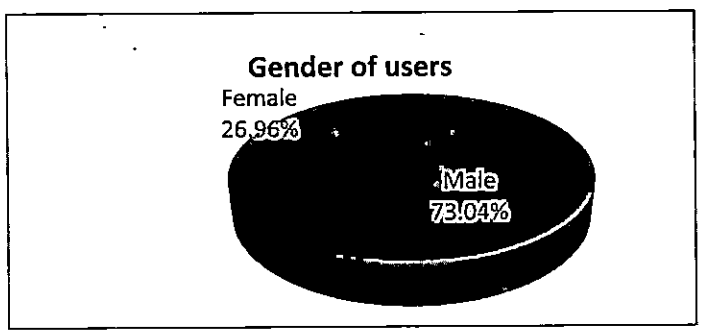


Figure 2: Gender information of respondents

Type of library preferred by users

The respondents were asked to indicate which library they prefer most. They opined that 77.39% users prefer digital library, 13.91% prefer hybrid library and 8.69% users prefer traditional library. The result is shown on the following Table.

Table 3: Type of library preferred by users

Type of library preferred by users	Frequency	Percent
Digital library	89	77.39%
Traditional library	10	8.69%
Hybrid library	16	13.91%
Total	115	100%

Purposes of using digital library

The library users indicate that they used digital document for various purposes. Among them, 56.52% users used digital library for education purpose, 32.17% used for research work, 32.17% used for updating knowledge, only 1.73% used for entertainment.

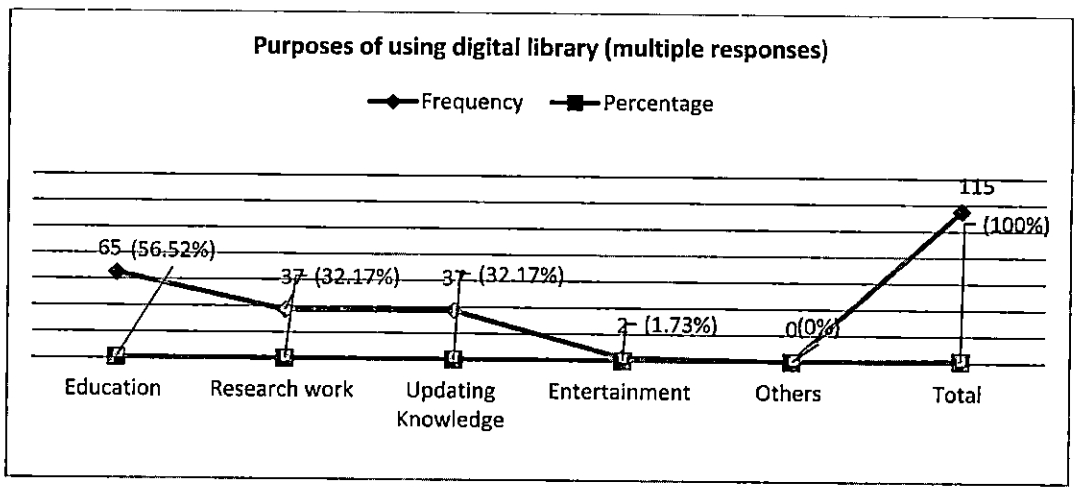


Figure 3: Purposes of using digital library

Users' search techniques to access digital collections

Users used many search techniques to access in digital collections of a library. Among them, 35.6% users used search with keyword, 28.6% used subject name, 15.6% used title of journal article and 13.9% used author search technique.

Table 4: Users' search technique to access digital collections

Search techniques used by the users	Frequency	Percent
Key Word	41	35.6%
Subject	33	28.6%
Author	16	13.9%
Date of Publication	2	1.7%
journal title	5	4.3%
Title of the article	18	15.6%
Total	115	100%

Resources most often used

Table 5 depicts that 21.7% users used electronic document, 28.6% used printed document and 49.5% used both type of document provided by the library.

Table 5: Resources most often used

Resources most often used	Frequency	Percent
Electronic document	25	21.7%
Printed document	33	28.6%
Both	57	49.5%
Total	115	100%

Format to access digital collections

Format is an important issue to access a digital collection. The users were asked to indicate which format they used to access digital collection.71.3% users used PDF format, 15.6% used plain text, 8.6% used html formats, 3.4% used bitmap page (image zoom in zoom out) and only 0.8% used other formats.

Table 6: Format to access digital collections

Format to access digital collections	Frequency	Percent
PDF	82	71.3%
HTML	10	8.6%
Plain Text	18	15.6%
Bitmap	4	3.4%
Others	1	0.8%
Total	115	100%

Search engines used to access digital information resources

The users were asked to indicate which search engines they gave priority to access digital information resources. Table 7 reveals that most of the users (87.8%) gave priority on Google search engines, followed by 6.9% gave priority on Yahoo search engines to access digital information resources.

Table 7: Search engines of library users

Search engines used	Frequency	Percent
Google	101	87.8%
Yahoo	8	6.9%
MSN	2	1.7%
Altavista	2	1.7%
Others	2	1.7%
Total	115	100%

Browser used to access in a digital collection

The users were asked to identify which browser they used to access into digital collection. Among them 45.2% used Mozilla Firefox, 33.0% used Google Chrome, 12.1% used opera mini, 6.0% used Internet explorer, 2.6% used safari and only 0.9% indicated other browser.

Table 8: Browser used to access in a digital collection

Browser used	Frequency	Percent
Mozilla Firefox	52	45.2%
Google Chrome	38	33.0%
Internet Explorer	7	6.0%
Opera mini	14	12.1%
Safari	3	2.6%
Others	1	0.9%
Total	115	100%

Frequency to accessing digital collections

The library user used the library to meet their requirement and the users were asked to how often they entered into a digital library. Among the users 13.91% used daily, 6.96% used once in a week, 14.78% used twice in a week, 57.39% used the digital collection when they felt need and only 6.96% used the digital library for other time.

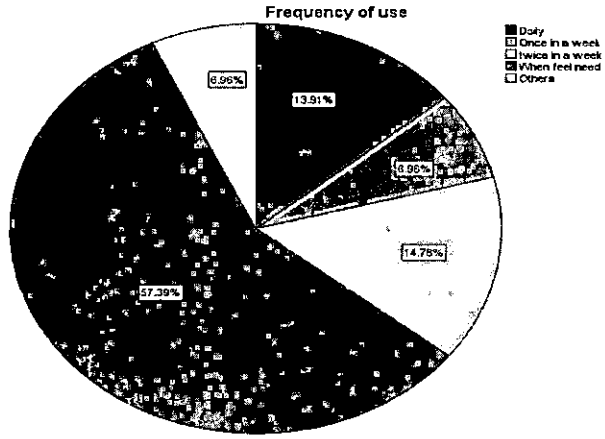


Figure 4: Time to access digital library collections.

Impacts of digital library

54.7% users mentioned strongly agree that digital libraries save the time of the user and the mean score is 4.16. 44.3% users strongly agreed that digital libraries provide multiple accesses to information and the mean score is 4.07. In the context of timely access to information, 40% users agreed strongly and the mean score is 4.05. In the point of improve use of information, 41.7% users strongly agreed and the mean score is 4.08. In improving collaboration 31.3% users mentioned neutral, 31.3% mentioned somewhat agree, and the mean score is 3.70. In narrow down the digital divide, 33% users strongly agreed and the mean score is 3.80. In the view of vast storage capacity, 64.3% users strongly agreed and the mean score is 4.40. The following Table will help to know the users' perception about the impacts of digital library.

Table 9: Impacts level of digital library activities

Impact factors	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree	Mean
Save time	63 (54.7%)	27 (23.4%)	13 (11.3%)	5 (4.3%)	7 (6%)	4.16
Multiple access	51 (44.3%)	34 (29.5%)	20 (17.3%)	8 (6.9%)	2 (1.7%)	4.07
Timely access to information	46 (40.0%)	40 (34.7%)	21 (18.2%)	5 (4.3%)	3 (2.6%)	4.05
Improved use of information	48 (41.7%)	41 (35.6%)	17 (14.7%)	6 (5.2%)	3 (2.6%)	4.08
Improved collaboration	33 (28.6%)	36 (31.3%)	36 (31.3%)	9 (7.8%)	1 (0.9%)	3.70
Narrow down the digital divide	38 (33.0%)	35 (30.4%)	27 (23.4%)	12 (10.4%)	3 (2.6%)	3.80
Vast storage capacity	74 (64.3%)	23 (20.0%)	12 (10.4%)	3 (2.6%)	3 (2.6%)	4.40

Note: The following weights were assigned to different items:

Strongly agree=5, Somewhat agree=4, Neutral=3, Somewhat disagree=2, Strongly disagree=1

For calculating weighted mean, the score of all items were summated and then divided by the total number of respondents.

Satisfaction level of user with digital library activities

Users were requested to identify the satisfaction level to use digital collection. Most of the users (60%) satisfied with the digital library activities, 23.4% users neither satisfied nor dissatisfied, and only 11.3% users were very satisfied with the digital library activities.

Table 10: Satisfaction level with digital library

Level of satisfaction with digital library	Frequency	Percent
Very Satisfied	13	11.3%
Satisfied	69	60.0%
Neither satisfied nor dissatisfied	27	23.4%
Dissatisfied	4	3.4%
Very dissatisfied	2	1.7%
Total	115	100%

Barriers to the digital libraries

The library user mentioned the barriers to digital libraries in Bangladesh. Table 11 shows the barriers to digital libraries in Bangladesh. In case of skilled manpower, 34.7% users thought it is a high problem and the mean score is 3.26. 28.6% users opined that infrastructure facility is a medium problem and the mean score is 3.18. In respect to standard network speed, 26.9% users mentioned very high problem and the mean score is 3.33. 26% users indicated that lack of awareness is a very high problem and the mean score is 3.05.

Table 11: Barriers to digital library

Barriers	Very high	High	Medium	Neutral	Low	Mean
Skilled manpower	18 (15.6%)	40 (34.7%)	29 (25.2%)	11 (9.5%)	17 (14.7%)	3.26
Infrastructure facilities	24 (20.8%)	25 (21.7%)	33 (28.6%)	14 (12.1%)	19 (16.5%)	3.18
Standard network speed	29 (25.2%)	26 (22.6%)	31 (26.9%)	12 (10.4%)	17 (14.7%)	3.33
Electricity power supply	11 (9.5%)	28 (24.3%)	33 (28.6%)	27 (23.4%)	16 (13.9%)	2.92
Lack of awareness	30 (26%)	20 (17.3%)	17 (14.7%)	22 (19.1%)	26 (22.6%)	3.05

10. Major findings of the research

The researchers provide with the major findings in this section. The findings generated based on the library users' view are the major findings of the study:

i. Most of the library users prefer digital library activities. There are few numbers of user have a tendency towards traditional library. The users also have a fear of using new technology because of technophobia.

ii. Most of the users of the selected libraries used keyword search technique to access digital collections. Besides, they have a priority on subject to search any document.

iii. Majority users use digital resources for education purpose. Some of the library users use digital resources for the purpose of research work and updating knowledge.

iv. Both print and electronic document used by most of the users. Printed document is used more than other type of document in the libraries. PDF and plain text format in a digital library collections mostly used by the users.

v. Most of the library users give priority on Google search engines to access digital information resources in the library. Some of the library users give priority on Yahoo, MSN, AltaVista and others. Most of the user used Mozilla Firefox and Google chrome browser to access digital collections.

vi. Majority of the users of the selected libraries use the digital collections when they feel need. Private university libraries are in a good position to provide digital document to the users than other libraries in Bangladesh.

vii. Satisfaction level with digital library is not so good in the libraries. Very few

respondents were very satisfied with digital library services. Some users were neither satisfied nor dissatisfied.

viii. Digital libraries with vast storage capacity help to improve use of information and save the time of users.

ix. Most of the users of the selected libraries identified the impact of digital libraries on the following regards:

a. Digital library ensures Ranganathan's fourth law, *i.e.*, save the time of the users. It does not have any time limitation to access digital collection. At any time we can access to digital library;

b. Most of the users opine that digital library provides multiple access facility;

c. Digital library is responsible for organizing and preserving the digital resources in an effective way.

d. Most of the library users think that digital library create storage and resource sharing environment; and

e. Users of the selected libraries belief that digital library narrow down the digital divide.

11. Suggestions

- Digital library practices in Bangladesh are at an elementary level. University libraries and special libraries in Bangladesh face problems in technological aspects toward digital library activities. The following suggestions may bring fruitful result to ensure digital library activities in Bangladesh:

i. Digital library based programme need to arrange in time to time to make digital library familiar in front of users. Workshops, training, and conferences need to arrange in a large scale to improve digitization practices in Bangladesh;

ii. Digital library based activities need to increase which will help to enhance the keenness of the users towards digital library;

iii. Internet is the core element in a digital library, so Internet facility should increase to all types of library user;

iv. Knowledge about digital library should provide to the library users in Bangladesh.

v. Libraries should increase digital resources for the users. Library should provide digital document at regular basis;

vi. Government and the library authority should allocate sufficient budget for digitization of library activities in Bangladesh;

vii. Libraries need to ensure skilled and techno-literate manpower with proper infrastructure facilities in Bangladesh;

viii. The standard network speed and electricity power supply need to ensure to create a digital library environment;

12. Conclusion

- This study emphasized on the overall digital library practices on some selected public and private university libraries and special libraries in Bangladesh. It is very essential to carry on digital library activities in Bangladesh to fulfill the user requirements in an effective way. The demand of the library users are growing day by day with technology based services and digital library can meet the users' requirement in a practical way. It is a matter hope that Bangladesh government has taken initiative to build digital Bangladesh. To fulfill this vision, Government and library authority need to take initiative on library digitization activities and put importance to digital library practices in public, private university libraries, special libraries and other libraries. Users' feedback is very necessary to maintain a user friendly digital library. Creating awareness about digital library activities is essential in Bangladesh. The government of Bangladesh has to take initiative to develop the concept of digital Bangladesh where everyone will have the opportunity to access to information. So, digital library and digitization activities will surely play important role to make a digital Bangladesh.

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DIGITAL RESOURCES MANAGEMENT

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Abstract: In this fast digital age we all are know everything is available on one click. Physical and electronic versions of scholarly resources serve different purposes: the former may be preferred for embedded graphic objects, whereas electronic versions are easier to access, often in varying combinations of portable document format (PDF), hypertext mark-up language (HTML), MS Word, extensible mark-up language (XML), and text. As libraries build ever-larger collections of electronic resources, finding ways to manage them efficiently becomes a major challenge. The number of electronic journals, citation databases, and full-text aggregations held by most libraries has grown rapidly.

Keywords: Digital Resource management, System, Serials, Electronic Resource.

1. Introduction

Managing these electronic resources involves providing the library's user with convenient ways to find and access them and providing library staff with the tools to keep track of them Libraries subscribe to electronic content in a number ofdifferent ways. Some publishers offer packages that include many electronic journals, some products may include electronic journals from many different publishers, and libraries acquire some electronic b journals individually. Abstracting-and-indexing (A&I) products include citations to articles in journals from many different publishers. And since not everything is in electronic form, print resources cannot be neglected.

There are two fundamental aspects to managing electronic resources:

1) Back-end Management Tools - Managing the digital resource details of back-end staff functions related to acquisition, payment, and licensing.

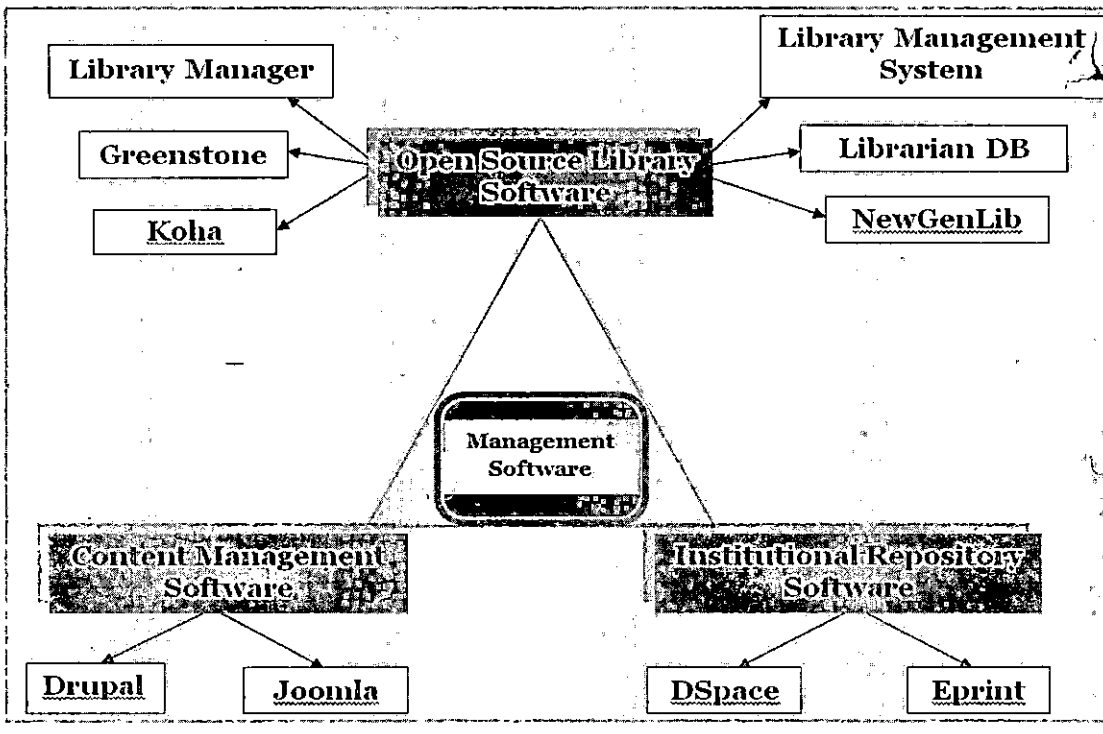
2) Front-end Management - The front-end details of delivering the content to library users.

Digital Resource Management (DRM)/

Electronic Resource Management (ERM)

- Digital Resource Management is the practices and software systems used by Libraries to keep track of important information about electronic information Resources, especially internet-based resources such as electronic journals, Databases and electronic books .
- The development of ERM became necessary in the early 2000s.
- The idea of developing electronic resource management systems emerged in 2001-2002, growing out of research by Tim Jewell at the University of Washington .
- The Digital Library Federation and NISO began work in May 2002 to develop
- standards for ERM data.
- These standards were published in the 2004 as Electronic Resource Management:
- Report of the DLF ERM Initiative.
- LIRC are mange e-resources as per their institutional requirements.
- There are various ways to manage e-resources like open source library software,
- content management software, and institutional repository software.
- The offering of some vendors consists of an electronic resource management System that forms an integral part of their integrated library system, whereas for Others such as Ex LIBRIS-the offering consists of a stand-alone module that works With a range of library systems and can also be packaged with other products From the same vendor.

Management Software for Digital Resources



Needs of Electronic Resource Management on Priority Basic

Needs	Description Summary
Workflow management	Support across e-resources including resource tracking, reminders, status assignments, routing and redistribution of workflow and communication or notifications to stakeholders or patrons as necessary.
License management	Manage license details, agreements.
Statistics management	Obtain, gather and organize usage statistics. Auto uploads statistics.
Administrative Information	Store and make accessible administrative information such as institute ID or usernames and passwords.
Acquisitions Functionality	Provide acquisitions support for budget management, fund management, financial reporting, repository of cost data and invoicing.
Integration/interoperability with other systems	Interoperate across systems, to support auto feeds, data loads and auto updates.

Subscription management	Manage and maintain library subscriptions to electronic content (new, dropped, cancelled, transferred), vendor changes, maintenance of subscription history, and verification of continued access.
User display	Support a variety of user display options to the public including A-Z journal listing, database lists and article-level linking.
Vendor contact information	Store and provide access to vendor information including contact data and account numbers.
Support for collection evaluation	Align and report data as appropriate to support the evaluation of the collection and cost analysis.
Consolidate ERM information	Store and provide access to ERM-related data in one place.
Package management	Track titles within packages appropriate to institution
Holdings Management	Identify and maintain appropriate coverage and URLs per title; support holdings display in the catalogue.
Reporting	Provide query-based reporting on desired characteristics.
Usability	Provide clean, easy to use interface with consistent displays.

2. Advantages of Electronic Resource Management

1. Innovative ERM saves staff time
2. Improves collection analysis
3. ERM makes the most of scarce budgetary resources
4. Easily accessible Web-OPAC
5. ERM makes it easy for patrons to find the e-resources they need, elegantly presenting important information such asrenewal dates; authentication, proxy data, and completecontent descriptions
6. Libraries can use Electronic Resource Management as astand-alone solution
7. Libraries can enjoy the benefits of ERM's ability to maintainresources, track licenses, and manage coverage data
8. ERM is tailor-made to take advantage of Innovative Quick Start implementation program that includes hundreds of easy-to-use e-resource records

3. Virtualized Management System

1. Virtualized management system effectively work for efficient digital resource management in libraries and resource centres.
2. Virtualized management systems energy efficiently manages by virtualized cloud data centres that reduces operational costs and provides required quality of library services.
3. Utility of modern resources create growing demand for high performance computing infrastructures.
4. This has led to the construction of large-scale computing data centres consuming enormous amounts of digital e-resources.
5. Virtualization technology allows one to create several virtual machines on a physical server and therefore, reduces amount of hardware in use and improves the utilization of digital resources.
6. Benefits of virtualization are improved fault and performance isolation between applications sharing the same resource; the ability to relatively easy move from one physical host to another using live or off-line migration; and support for hardware and software heterogeneity.
7. The recently emerged Cloud computing paradigm leverages virtualization technology and provides the ability to provision resources on-demand on the pay-as-you-go basis.
8. Organizations can outsource their computation needs to the Cloud, thereby eliminating the necessity to maintain own computing infrastructure.
9. Cloud computing strongly supports NPTEL Lectures, online free as well as chargeable courses, lecture series, distance learning, audio visual conferencing etc.
10. Virtualization plays important role for accessibility in 24×7 connectivity.
11. Cloud computing naturally leads to energy-efficiency by providing the following characteristics:

- Economy of scale due to elimination of redundancies.
- Improved utilization of the resources.
- Scaling up and down – resource usage can be adjusted to current requirements.
- Efficient resource management by the Cloud provider.
- Providing quality of services environ

4. Conclusion

Digital presence in libraries and proliferation of electronic resources in terms

of production, acquisition and usage the management of e-resources remains a cumbersome process. The process involved in the management of e-resources has often overwhelmed the library personnel. In the library and resources center activities are easily and effectively maintain by ERM. ERM fluently performing activities like trial access, selecting the specific resource from the gamut of other resources followed by acquisition of the specific resource into the library realm and then felicitating access to the users and then the follow-up of studying the usage of the resource for further continuation of those resources. In between these processes there is the cumbersome chore of going through the licensing agreements and keeping the records correct. All these processes are time consuming and involve a lot of work. These relentless arrays of work have made librarians to look for systems which can save their time and energy and provide efficient management of E-resources.

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LEARNING STYLES OF STUDENTS OF LIBRARY AND INFORMATION SCIENCE: A CASE STUDY OF GULBARGA UNIVERSITY, KALABURAGI

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Abstract: This paper aims to provide the learning styles of students of library and information science department of Gulbarga University by developing an integrated study system. The information on learning styles of 39 students of department of Library and Information Science of Gulbarga University was studied. The article explains the questionnaire modules. Out of 39 students, 26 are boys and 13 are girls. Fifty nine percent of students (N= 23) have a good knowledge of computers, whereas only 10.3% (N=4) have excellent knowledge of computers. They also have a good knowledge of Internet (71.8 %; N=28) and only few (10.3%) students have excellent knowledge. Most of the students are having study schedules and only one student does not have it. Majority are visual learners (46.2%; N=18)), followed by auditory learners (17.9%) and while three are visual and auditory.

Keywords: Learning style, visual learner, auditory learner

1. INTRODUCTION:

Data analysis is most important part of research work. It is the process of ordering into constituent parts to obtain answers to questions. The question formulated in the form of guiding principles. The data collected by distributing the questionnaire among the students of library and information science department in Gulbarga University. The information has been gathered by asking the respondents and by contacting in person to carry out the present study on learning styles. Thus collected data was entered in the computer in excel sheet and the data was tabulated. Statistical tools were applied to calculate the percentage. The results of the computation are presented in the tables and used for interpretation of data.

2. SCOPE AND LIMITATIONS OF THE STUDY:

The study covers the students of 2016-17 batch of department of Library and Information Science, Gulbarga University, Kalaburagi. It was observed that students are using simple learning styles, especially by accessing information available in the internet.

3. METHODOLOGY:

The study is based on data collected through a questionnaire from the students of LIS Department, Gulbarga University, Kalaburagi. The information is also gathered from various sources like books, articles, journals, internet, paper magazine, reports for writing background chapter. The study covers 39 students of LIS Department. Out of which, twenty-six are boys and thirteen are girls.

4. ANALYSIS AND INTERPRETATION OF DATA:

CHARACTERISTIC OF STUDY POPULATION:

Table-1 LIS Students

Semester	Frequency	Percent	Valid Percent	Cumulative Percent
MLISc II Sem	15	38.5	38.5	38.5
MLISc IV Sem	24	61.5	61.5	100.0
Total	39	100.0	100.0	

Table-1 shows total number of students of MLISc I and IV semester in the department of library and information science. Out of 39 students, 15 students are from the first semester and 24 students are from the fourth semester. 38.5 percent of students are in first semester and others (61.5%) in fourth semester. More number of students are in fourth semester than in first semester.

Table-2 Distribution of Students by Sex

Sex	Frequency	Percent	Valid Percent	Cumulative Percent
Male	26	66.7	66.7	66.7
Female	13	33.3	33.3	100.0
Total	39	100.0	100.0	

There are twenty male students and thirteen female students are studying in the department. Majority are (66.7%) male students and only 33.3 percent are female

Students. Less number of female students compared to their male counterparts in the department (Table-2).

Table -3: Distribution of students according to their Age

Age (in years)	Frequency	Percent	Valid Percent	Cumulative Percent
21	4	10.3	10.3	10.3

22	3	7.7	7.7	17.9
23	10	25.6	25.6	43.6
24	7	17.9	17.9	61.5
25	4	10.3	10.3	71.8
26	7	17.9	17.9	89.7
27	1	2.6	2.6	92.3
28	2	5.1	5.1	97.4
30	1	2.6	2.6	100.0
Total	39	100.0	100.0	

Table-3 shows the age wise distribution of students. More than one-fourth are 23 years, 17.9% each are 24 and 26 years, and another 10% are 21 years

Table-4: Category Wise Distribution of Students

Category	Frequency	Percent	Valid Percent	Cumulative Percent
GM	3	7.7	7.7	7.7
SC	17	43.6	43.6	51.3
ST	4	10.3	10.3	61.5
Cat – I	1	2.6	2.6	64.1
II A	1	2.6	2.6	66.7
II B	4	10.3	10.3	76.9
III A	3	7.7	7.7	84.6
III B	6	15.4	15.4	100.0
Total	39	100.0	100.0	

Table-4 points out the category of respondents. Three students are from GM (General Merit), seventeen are from SC, four are from ST, each one from Cat-I and II B respectively, four are from II B, and three are from III A and six are from III B category. Majority of the students are from the SC (Scheduled Caste) category. They constitute 43.6 percent of total students.

Table -5: Education Background Students

Education Background	Frequency	Percent	Valid Percent	Cumulative Percent
BA	30	76.9	76.9	76.9
BSc	2	5.1	5.1	82.1
B Com	5	12.8	12.8	94.9
Other	2	5.1	5.1	100.0
Total	39	100.0	100.0	

The status of educational background of respondents is given in Table - 5. More than three-fourth of students are from arts background, and of the remaining, 5.1 percent of students from science; 12.8 percent of students from B Com (Bachelor of Commerce) and 2.5 percent of respondents from other educational backgrounds. Most of the students are form BA (Bachelor of Arts)

Table-6: Studing in Medium

Medium of Study	Frequency	Percent	Valid Percent	Cumulative Percent
Kannada	27	69.2	69.2	69.2
English	12	30.8	30.8	100.0
Total	39	100.0	100.0	

Table- 6 shows the language in which the students did their earlier studies before joining the MLISc course. 27 (69.2%) students are from Kannada medium and 12 30.8%) are English medium

Table -7: Distribution of the Students by locate

Are you coming from:	Frequency	Percent	Valid Percent	Cumulative Percent
Rural area	25	64.1	64.1	64.1
Urban area	14	35.9	35.9	100.0
Total	39	100.0	100.0	

Table -7 shows background of the respondents whether they have come from the rural or urban. Majority are (64.1 %) respondents are from rural area and 35.9% are from urban area.

Table -8 Parents Educational Background of the Students

Education	Frequency	Percent	Valid Percent	Cumulative Percent
Illiterate	7	17.9	17.9	17.9
Primary	2	5.1	5.1	23.1
High School	5	12.8	12.8	35.9
PUC	7	17.9	17.9	53.8
Graduate	7	17.9	17.9	71.8
Postgraduate	11	28.2	28.2	100.0
Total	39	100.0	100.0	

Table-8 shows the educational background of parents of the respondents. 7 (17.9 %) respondents are having illiterate parents. Parents of 2 (5.1) respondents have completed their primary education and parents of 5 (12.8%) respondents have completed their high school. 7 (17.9%) respondents are having their parents who have studied up to PUC (Pre-University Education). 7 (17.9%) respondents have graduated parents and 11(28.2 %) postgraduate pare

Table -9: Parents Annual Income of the Students

Annual Income (Rs.)	Frequency	Percent	Valid Percent	Cumulative Percent
10000	12	30.8	30.8	30.8
11000	6	15.4	15.4	46.2
12000	5	12.8	12.8	59.0
15000	1	2.6	2.6	61.5
16000	5	12.8	12.8	74.4
20000	4	10.3	10.3	84.6
30000	2	5.1	5.1	89.7
36000	1	2.6	2.6	92.3
40000	1	2.6	2.6	94.9
80000	1	2.6	2.6	97.4
85000	1	2.6	2.6	100.0
Total	39	100.0	100.0	

It is observed from the table that more number of respondents are having their parents with only Rs.10, 000 annual income. 12 (30.8) respondents have parents with Rs. 10000 annual income and 6 (15.4) students have Rs. 11000. Parents of 5 (12.8 %) students have Rs.12000 income, 1 (2.6) respondent is having parents

getting annual income Rs. 15000. 5 (12.8) students have parents with Rs.16000. Parents of 4 (10.3) respondents are earning Rs. 20000. Parents of 2 respondents are getting Rs.30000 annual income. Parents 4 students are gaining annual income Rs. 36000, Rs.,40000, Rs.80000, Rs.85000 respectively

Table -10: Parents Occupation of the Students

Parents Occupation	Frequency	Percent	Valid Percent	Cumulative Percent
Agriculturists	19	48.7	48.7	48.7
Employed	10	25.6	25.6	74.4
Private Job	4	10.3	10.3	84.6
Labour	1	2.6	2.6	87.2
Business	1	2.6	2.6	89.7
Social Worker	1	2.6	2.6	92.3
Retired	3	7.7	7.7	100.0
Total	39	100.0	100.0	

Table-10 gives the occupation wise distribution of s of the parents of LIS students. Almost half of the students 19 (48.7) students whose parents occupation is agriculture. Another one-fourth 10 (25.6) working as government employees, 10.3% of students parents are working in private sector. Parents of 3 students are labourers, business man and social worker respectively. The 7.7% of students whose parents are retired from jobs.

Table -11: Medium of Examination at UG Level

Medium of Examination	Frequency	Percent	Valid Percent	Cumulative Percent
Kannada	8	20.5	20.5	20.5
English	31	79.5	79.5	100.0
Total	39	100.0	100.0	

Table - 11 shows the medium of UG (Under-Graduate) examination of the LIS students. Most of the students, 31 out 39, their medium examination was in English whereas only 8 (20.5%) them have opted for Kannada language to write their undergraduate examinations.

Table -12: Distribution of LIS Students: Knowledge of Computers

Knowledge of Computers	Frequency	Percent	Valid Percent	Cumulative Percent
Excellent	6	15.4	15.4	15.4
Good	23	59.0	59.0	74.4
Average	9	23.1	23.1	97.4
Poor	1	2.6	2.6	100.0
Total	39	100.0	100.0	

Table -12 indicates status of computer knowledge of LIS students. LIS profession requires very sound knowledge of computers. 59% of students have good knowledge of computer, another 15.4% excellent, while one students is poor at computer

Table 13: Knowledge of Internet

Knowledge of Internet	Frequency	Percent	Valid Percent	Cumulative Percent
Excellent	4	10.3	10.3	10.3
Good	28	71.8	71.8	82.1
Average	7	17.9	17.9	100.0
Total	39	100.0	100.0	

It is observed from the table -13 that majority of the students have good knowledge of Internet. 28 (82.1) students are having good knowledge of Internet, only few of them have excellent knowledge of it, whereas 7 (17.9%) of them are having average knowledge of Internet.

Table-14: Time Spent of Studies

Time Spent on Studies (in hrs)	Frequency	Percent	Valid Percent	Cumulative Percent
1	1	2.6	2.6	2.6
2	9	23.1	23.1	25.6
3	10	25.6	25.6	51.3
4	8	20.5	20.5	71.8
5	4	10.3	10.3	82.1
6	1	2.6	2.6	84.6
8	4	10.3	10.3	94.9
9	1	2.6	2.6	97.4
10	1	2.6	2.6	100.0
Total	39	100.0	100.0	

The time spent by LIS students on studies is given Table- 14. Majority have spent 24 hrs for studies

Table -15: Students Study Plan/Schedule

Study plan/schedule	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	38	97.4	97.4	97.4
No	1	2.6	2.6	100.0
Total	39	100.0	100.0	

It is noted from the below data that most of the students have their study plan/ schedule.

5. LEARNING STYLES OF LIS STUDENTS:

Table-16 Learning Styles

Learning Style	Frequency	Percent	Valid Percent	Cumulative Percent
Visual	18	46.2	46.2	46.2
Auditory	7	17.9	17.9	64.1
Tactile	9	23.1	23.1	87.2
Visual and Auditory	3	7.7	7.7	94.9
Visual and Tactile	2	5.1	5.1	100.0
Total	39	100.0	100.0	

Table -16 shows learning styles of LIS students. More than 45% of students are visual, one -fourth tactile, and around 18% are auditory. Three students exhibit combination of Visual and Auditory and while two students are Visual and Tactile. This finding has implications for education instructions and especially the teaching methods to be adopted by the students. The students group is not homogenous. Therefore, the teachers have to adopt a combination of instructional methods to suit the requirements of students.

Table 17: Semester Wise Learning Style

Semester	Visual	Auditory	Tactile	Visual and Auditory	Visual and Tactile	Total
II Semester Count % of Total	7	2	1	3	2	15
	17.9%	5.1%	2.6%	7.7%	5.1%	38.5%
IV Semester Count % of Total	11	5	8	0	0	24
	28.2%	12.8%	20.5%	0.0%	0.0%	61.5%
	18	7	9	3	2	39
Total Count% of Total	46.2%	17.9%	23.1%	7.7%	5.1%	100.0%

Table-17 shows Semester wise distribution of students against learning styles. The above table indicates that 17% and 28.2% of students of II and IV semesters are Visual. 5.1% students of II Semester are auditory and 2.6% students are tactile, while in IV semester, 28.2% students are visual, 12.8% Auditory, and 20.5% students are Tactile

Table 18: Sex wise Learning Styles

Sex	Visual	Auditory	Tactile	Visual and Auditory	Visual and Tactile	Total
Male Count% of Total	12	6	7	1	0	26
	30.8%	15.4%	17.9%	2.6%	0.0%	66.7%
	6	1	2	2	2	13
Female Count% of Total	15.4%	2.6%	5.1%	5.1%	5.1%	33.3%
	18	7	9	3	2	39
Female	46.2%	17.9%	23.1%	7.7%	5.1%	100.0%

Table-18 Shows that-total male percent of Visual 30.8% and 15.4% Auditory and 17.9% Tactile. Female students 15.4% selected Visual and 5.1% students select Tactile in all these highest percent of Visual with the percentage of 46.2%.

Table 19: Category Wise Learning Style

Category	Visual	Auditory	Tactile	Visual and Auditory	Visual and Tactile	Total
GM Count% of Total	2	0	1	0	0	3
	5.1%	0.0%	2.6%	0.0%	0.0%	7.7%
SC Count% of Total	8	5	4	0	0	17
	20.5%	12.8%	10.3%	0.0%	0.0%	43.6%
ST Count% of Total	1	0	1	2	0	4
	2.6%	0.0%	2.6%	5.1%	0.0%	10.3%
Cat - I Count% of Total	0	0	1	0	0	1
	0.0%	0.0%	2.6%	0.0%	0.0%	2.6%
II A Count% of Total	1	0	0	0	0	1
	2.6%	0.0%	0.0%	0.0%	0.0%	2.6%

Table-19 Shows that category of LIS students. All category students are studying in this department with the highest percent of students are SC with the percent of 20.5% and lowest IIIB with the percent of 2.6%. Most of the SC and IIIB students are visual

Table 20: Learning Style by Education Background

Education Background	Visual	Auditory	Tactile	Visual and Auditory	Visual and Tactile	Total
BA Count% of Total	16	4	6	2	2	30
	41.0%	10.3%	15.4%	5.1%	5.1%	76.9%
BSc Count% of Total	0	1	0	1	0	2
	0.0%	2.6%	0.0%	2.6%	0.0%	5.1%
B Com Count% of Total	1	2	2	0	0	5
	2.6%	5.1%	5.1%	0.0%	0.0%	12.8%

Other Count% of Total	1	0	1	0	0	2
	2.6%	0.0%	2.6%	0.0%	0.0%	5.1%
Total	18	7	9	3	2	39
	46.2%	17.9%	23.1%	7.7%	5.1%	100.0%

Table-20 Table 20 shows the educational background of LIS students II and IV semester. Highest students are coming from BA background with the percent of 46.2%., and then came from other background 2.6%.. Majority of students with arts background are visual learners.

Table 21: Learning Style at the College and Medium of Study

Medium of Study at the College	Visual	Auditory	Tactile	Visual and Auditory	Visual,and Tactile	Total
Kannada Count% of Total	16	4	6	1	0	27
	41.0%	10.3%	15.4%	2.6%	0.0%	69.2%
English Count % of Total	2	3	3	2	2	12
	5.1%	7.7%	7.7%	5.1%	5.1%	30.8%
Total Count % of Total	18	7	9	3	2	39
	46.2%	17.9%	23.1%	7.7%	5.1%	100.0%

Table-21 shows the medium of study at the college and most of students whose medium of study is Kannada are visual learners.

Table 22: Learning Styles of Students from different locations

Are you coming from:	Visual	Auditory	Tactile	Visual and Auditory	Visual and Tactile	Total
Rural area Count% of Total	11	6	7	1	0	25
	28.2%	15.4%	17.9%	2.6%	0.0%	64.1%

Urban area Count % of Total	7	1	2	2	2	14
	17.9%	2.6%	5.1%	5.1%	5.1%	35.9%
Total Count% of Total	18	7	9	3	2	39
	46.2%	17.9%	23.1%	7.7%	5.1%	100.0%

Learning styles of students from different location such as rural v/s urban is given Table-22.. Highest percent of students came from rural area with the percent of 64% and urban area with the percent of 35.9%. Out of the total, relatively a large majority from rural area are visual learners.

Table 23: Knowledge of Computers * and Learning Style

Knowledge of Computers	Visual	Auditory	Tactile	Visual and Auditory	Visual and Tactile	Total
Excellent Count% of Total	2	2	2	0	0	6
	5.1%	5.1%	5.1%	0.0%	0.0%	15.4%
Good Count % of Total	12	3	5	2	1	23
	30.8%	7.7%	12.8%	5.1%	2.6%	59.0%
Average Count % of Total	3	2	2	1	1	9
	7.7%	5.1%	5.1%	2.6%	2.6%	23.1%
Poor Count % of Total	1	0	0	0	0	1
	2.6%	0.0%	0.0%	0.0%	0.0%	2.6%
Total Count % of Total	18	7	9	3	2	39
	46.2%	17.9%	23.1%	7.7%	5.1%	100.0%

Table 23 gives Knowledge of Computers * and Learning Style. Most of the students who are good in computer are visual learners.

Table 24: Knowledge of Internet and Learning Style

Knowledge of Internet	Visual	Auditory	Tactile	Visual and Auditory	Visual and Tactile	Total
Excellent Count% of Total	1	2	1	0	0	4
	2.6%	5.1%	2.6%	0.0%	0.0%	10.3%
Good Count % of Total	15	4	6	2	1	28
	38.5%	10.3%	15.4%	5.1%	2.6%	71.8%
Average Count % of Total	2	1	2	1	1	7
	5.1%	2.6%	5.1%	2.6%	2.6%	17.9%
Total Count % of Total	18	7	9	3	2	39
	46.2%	17.9%	23.1%	7.7%	5.1%	100.0%

Table 24: Knowledge of Internet and Learning Style indicated that the majority of students who have the good knowledge of Internet are visual learners.

6. SUMMARY OF FINDINGS:

- A total of fifteen (38.5%) in MLISc II and twenty four students in MLISc IV (66.7%) have enrolled for PG Program in LISc..
- The most of the students in the department are male (66.7%; N =26) and remaining thirteen are females.
- Out of 39 students seventeen (43.6 %) belongs to schedule caste category and six (15.4%) from IIIB category.
- Most of the students are from Bachelor Arts (B.A.) background and only 5.1 % students had Bachelor of Science (B.Sc.) background.
- Nearly less than fifty percent of (48.7%; N=19) students are from agricultural family and one fourth of the students (25.6%) parents are government employees..
- The most of the students are from rural background (64.1%; N=25) and others (12.8 %;-N=14) are from urban area.
- Fifty nine percent of students (N= 23) have a good knowledge of computers, whereas only 10.3% (N=4) have excellent knowledge of computers.
- They also have a good knowledge of Internet (71.8 %; N=28) and only few

(10.3%) students have excellent knowledge.

- Most of the students are having the study schedules and only one student does not have it.
- Majority are visual learners (46.2%; N=18)), followed by auditory learners (17.9%) and while three are visual and auditory.

7. CONCLUSION:

The present study on learning-styles concept led to identify the different forms of learning styles used by the students of library and information science department in Gulbarga University The preference of learning styles varies across demographic characteristics. Visual learning: reading, studying charts, Auditory learning: listening to lectures, audiotape, Kinaesthetic learning: experiential learning, that is, total physical involvement with a learning situation, Tactile learning: «hands-on» learning, such as building models or doing practical. No education programme can afford to neglect needs of students in meeting the demands of learning what we need a personalized education to match the learning environment with the learners' learning styles. Training students to be at their best is no longer an easy task. It is an on-going challenge for educators to meet the ever increasing demands.

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LIBRARY PORTALS: A GATEWAY TO LIBRARY RESOURCES

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Abstract: Library portals are gates to the library resources. A well designed library portal will definitely increase the utility of library resources. Giving appropriate links with recent and relevant information is equally important. The links given should be regularly visited by the library staff to make sure about their working. In this paper an attempt is made to explain the library portal of Central library, Manipal Institute of Technology, Manipal University, Manipal. It is found that the provision of important links like remote access, NPTEL videos, BIS codes, online journals, e-book, e-databases, etc. has enhanced the utility of the resources subscribed by the library.

Keywords: Full text links, Library portal, Manipal University, Web portal.

1. Introduction:

Libraries are called as knowledge centres and it is the responsibility of the library managers to provide relevant information to their users. Because of the availability of a lot of information libraries are finding it difficult to organize them properly. In the recent years, online resources have taken the front end in the library scenario. Once acquired in the library these resources need to be properly organized. This has necessitated the creation of a portal or library portal. The "portal" is an entry point to the world of resources, designed to save the user's time, to unite him or her with relevant resources, and to encourage maximum use of acquired resources. Library portals play an effective role in the higher education system of the country.

2. Portal: Meaning and Definition

The word portal is derived from the Latin word "Porta", which means "gate". So, portal acts as a gate to the contents.

According to Looney and Lyman [1](2000) "A variety of useful information into a single, 'one-stop' web-page, helping the user to avoid being overwhelmed by 'infoglut' or feeling lost in the web"

According to Heflin [2](2003), "A portal is a website that collects information for a group of users that have a common interest".

3. What is a web portal?

"A Web portal is most often a specially designed website that brings information together from diverse sources in a uniform way. Usually, each information source gets its dedicated area on the page for displaying information (a portlet); often, the user can configure which ones to display".

If an institution develops its web portal, it includes many web pages, each page having details about the different departments run by that organization. All queries related to the institute are answered by the information available in the web portal.

4. Library Portals:

Library portals are the subset of Web portals and serve distinct academic research communities. Library portals act as gateways to library resources. They typically provide a path to an institution's resources by listing them for users and creating a direct link to the native interface of each resource.

After subscribing the e-resources in the library, it is the responsibility of the librarian to see that it is fully utilized. Information and Communication technology has helped librarians to revolutionize their services and library portal is an outcome of that.

Library portal is a personalized, customizable and integrated form of platform. It offers access to a broad array of resources either in an intranet or on an internet.

5. Contents of Library portal:

Library portal is an application which allows one-stop access/searching and discovery via a unified single point interface to resources subscribed by the library enabling services to the defined user community.

Library portal may contain the following links:

- Library rules and regulations
- Details about library services
- Links to online journals
- Links to online database
- Links to e-books
- Link to new additions
- Old question papers
- WEB OPAC

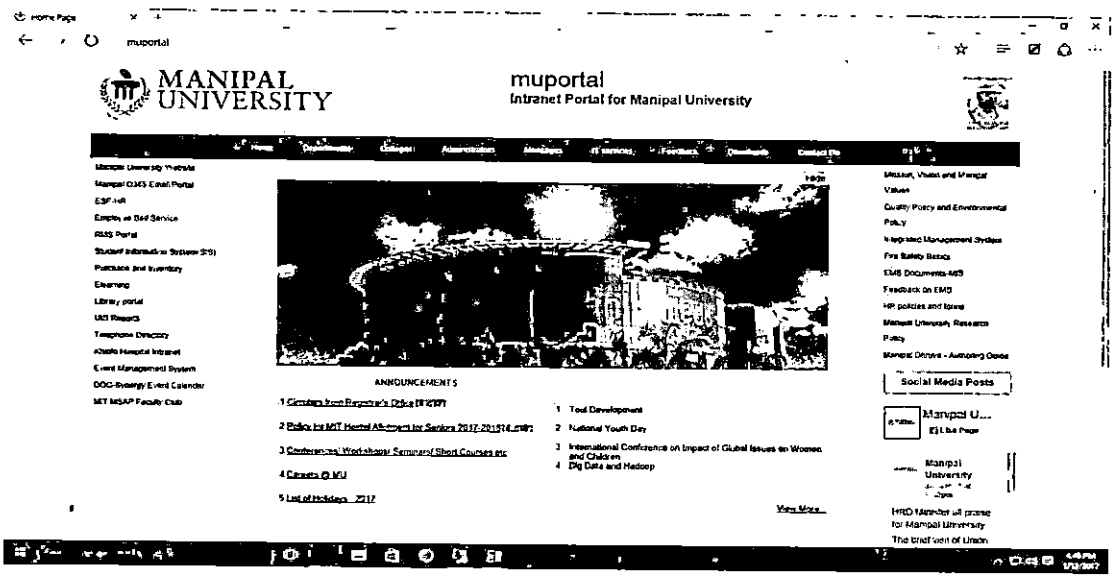
6. Manipal University:

Manipal University is synonymous with excellence in higher education. Over 28,000 students from 57 different nations live, learn and play in the sprawling University town, nestled on a plateau in Karnataka's Udupi district. It also has nearly 2500 faculty and almost 10000 other support and service staff, who caterto the various professional institutions in health sciences, engineering, management, communication, and humanities which dot the Wi-Fi-enabled cámpus.

Every institute has world class facilities and pedagogy, which are regularly reviewed and upgraded to reflect the latest trends and developments in higher education.

7. Manipal University intranet portal and library portal:

Following is the screen shot of Manipal University intranet portal which has a link to library portal. It has various useful links like Employee self-service, student information system, e-learning, Library portal, etc.



8. MANIPAL UNIVERSITY INTRANET PORTAL

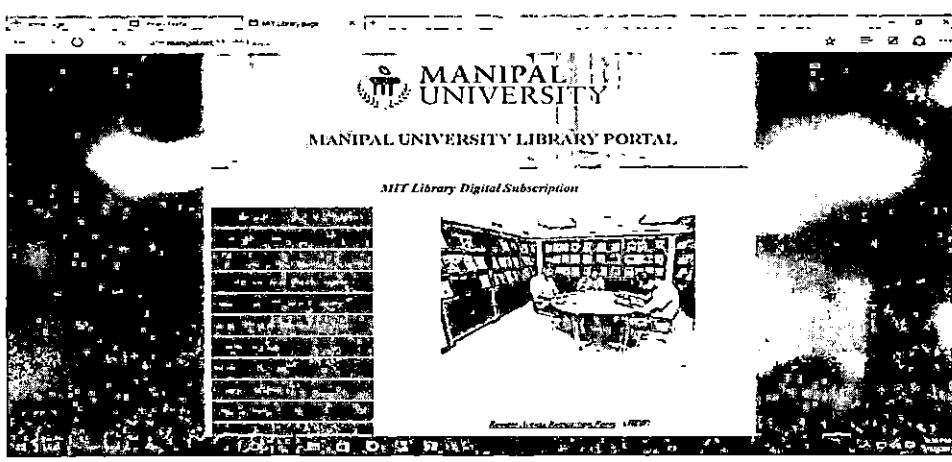
There is link Library portal in the intranet clicking which the user will get access to various libraries maintained by the university constituent institutions.



9. MANIPAL UNIVERSITY LIBRARY PORTAL

Library portal of Manipal Institute of Technology:

The Manipal Institute of Technology (MIT), Manipal was established in 1957 as one of the first self-financing engineering colleges in the country. In 2000, it became a constituent institute of the deemed University - Manipal Academy of Higher Education (MAHE), which is known today as Manipal University. MIT offers a Bachelor's and Master's program in engineering streams. It also gives students the option to carry out full-time or part-time research. The institute undertakes sponsored research programs supported by funding agencies such as DST, CSIR, AICTE and the Ministry of Environmental Sciences. It has collaborative research programs in association with premier research laboratories and institutes in India and abroad. MIT is celebrating its diamond jubilee in 2017.



10. MANIPAL UNIVERSITY LIBRARY PORTAL

Design of library portal:

Library portal is designed with a very simple structure. Users can access the link library catalogue to know about the availability of print resources in the library. The users can move around the portal very easily as the links given are hyperlinks

Library subscribes many e-journals and numerous e-books. Separate links are given for all the full-text journals and e-books subscribed by the library as follows:

Full-Text Links

e-Journals

ACM Digital Library(Journals)

ASCE Digital Library(Journals)

ASME digital library(Journals)

ASTM Standards & Engineering Digital Library

EBSCO - Art & Architecture Complete

IEEE/IEE Online(Journals)

Science Direct (Elsevier Journals)

Springerlink(Journals)

Subscribed online Journals

World Scientific Journals(List of Journals - 2014 onwards)

e-Books

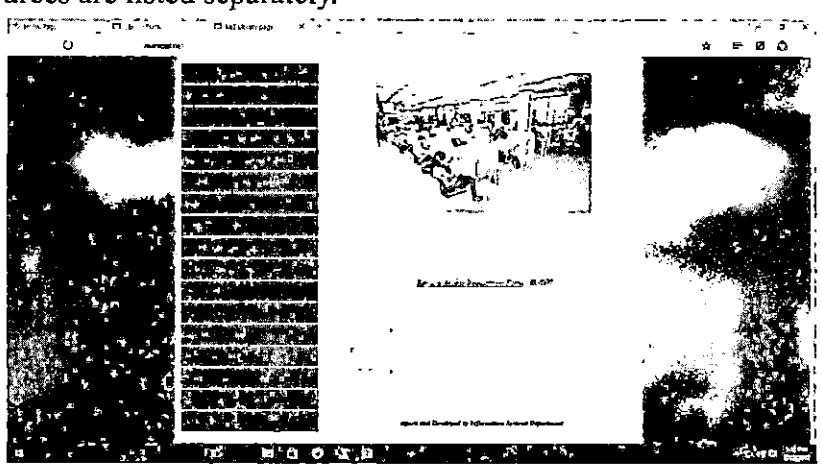
AIAA E-Books(List of E-books)

EBSCO - Art & Architecture Complete

Mc GRAW-Hill Access Engineering

Springerlink(eBooks)

Online databases are listed separately to attract the user's attention to the same. Open access resources are listed separately.



11. LINKS TO ONINE DATABASES

The unique facilities like the remote access to electronic resources, NPTEL videos, etc. are given separate links to provide easy access.

12. Conclusion:

Library portals are playing a vital role in the utility of the resources subscribed by the library. A well designed library portal is a boon to the users. The number of queries received will be definitely less if the library portal has all relevant links. Any new thing added to the library finds a place in the library portal and it remains a single click guide to the user. Instead of sending circulars librarian also find it easy to provide a link in the portal.

13. Acknowledgement:

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She has presented several papers in national and international conferences and participated in many workshops. She has also published many papers in journals and edited books. She is an active member of LIS professional associations; served as executive member and secretary of Dakshina Kannada and Kodagu Libray Association, Udupi.

Mapping Intellectual Structure of Digital Library Research in India: A Co-word and Co-author Analysis

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Abstract: The aim of this study is to map the intellectual structure of digital library (DL) field in India during the period of 2007-2016. Co-word analysis was employed to measure the relationship strength of each term from the relevant publications. Data were retrieved from Science Citation Index (SCI) and Indian Citation Index (ICI) for the period of 2006-2015 and were analyzed according to hot topics and authors. And then social network maps and clustering was used to visualize the co-occurrence matrix and co-authorship network. The results were mapped and clustered by VOS viewer. The results show that there are some hot and emerging research themes that have been pacing towards new sub-directions of research in DL field in India. Co-authorship networks also shows that such divergent research direction has been influencing researcher to be involved in collaborative digital library research in India.

Keywords: Digital Library Research, Co-word Analysis, India, Social Network Analysis, Indian Citation Index

1. Introduction

Digital library research has been gaining momentum in India with the rapid growth and interest in digital libraries worldwide over the past years. The Digital Library of India (DLI), a pilot project under Universal Digital Library Project has unfolded a new horizon across a broad array of issues related to design, implementation, development and evaluation of digital libraries since it started in November, 2002 (Balakrishnan et. al., 2005;Ambati et. al.,2006). It is also the largest digitization initiative in India aiming to involve over ninety institutions to digitize and make accessible thousands of rare books written in Indian languages

as well as other languages through web (Das, Sen and Dutta 2010). Besides these, there are many international conferences such as the International Conference of Asian Digital Libraries (ICADL) 2001, International Conferences on Digital Libraries (ICDL) 2004, 2006, 2010 and 2013 has been motivated digital library awareness and developments in India. Networks like UGC-INFONET, INFLIBNET, DELNET, ADINET, ERNET, CALIBNET, BONET, INDONET, MALIBNET, NICNET, I-NET, SIRNET and many more have been established time to time for promoting digital libraries development in India. With the development effort of digital libraries, a wide range of research has been conducted for understanding the phenomena and creating innovation in the field. A wide array of institutions from research and educational and R&D sectors are involved in digital library research in India. Individual and collaborative research efforts have been made by the academics from universities, researchers from institutions, employees from firms to influence digital library development in India. There have always been a positive co-relation between research and development (R&D) in any field. The trends and patterns of literatures of a particular knowledge domain provide an overview of the related field(s) and relationships among the specific fields among individuals and research communities of similar interests (Chen, 2006). So to trace the development and intellectual structure of a knowledge domain, it is necessary to know about the present research focus and thus visualizing the future of a particular domain.

2. Objectives of the Study

Until now, no studies focussd on the relationship and structure among research topics in DL field in India. This study aims to map the intellectual structure of DL field in India during the period of 2007-2016 using co-word analysis, including the relationships among keywords and author networks.

3. Materials and Methods

For this study, several important steps will be followed to accomplish our research: counting the keywords frequency, selecting high-frequency keywords, making co-occurrence matrix, clustering keywords, interpreting intellectual structure of topics represented by social network analysis. Web of Science (WoS) and Indian Citation Index (ICI) these two databases were selected as data source in this study. From WoS, we retrieved the related articles of DL field, the time span from 2006 to 2015 where in the fields of title (TI), abstract (AB), author-key word (DE), and key word Plus (ID) added by the ISI database indexers with the title 'Digital Library'. ICI has used in this study to subsidize the limitation of WoS that may not cover all Indian national publication. ICI is an abstracts and citation database that provides substantive list and abstracts of articles published in local Indian journals across all disciplines from 2004 onwards. After

searching these two databases a total of 1097 titles were found. After the elimination of the duplicates and those having no keywords, 3187 keywords from 713 journal articles were selected for final analysis. The keywords with frequencies lower than 7 implied that there are few researchers pay attention to them. So we remove the keyword which has less than 7 frequencies, 83 related keywords with an individual frequency greater than 7 were used for this study at last. The steps of co-word analysis of were shown in Fig.1.

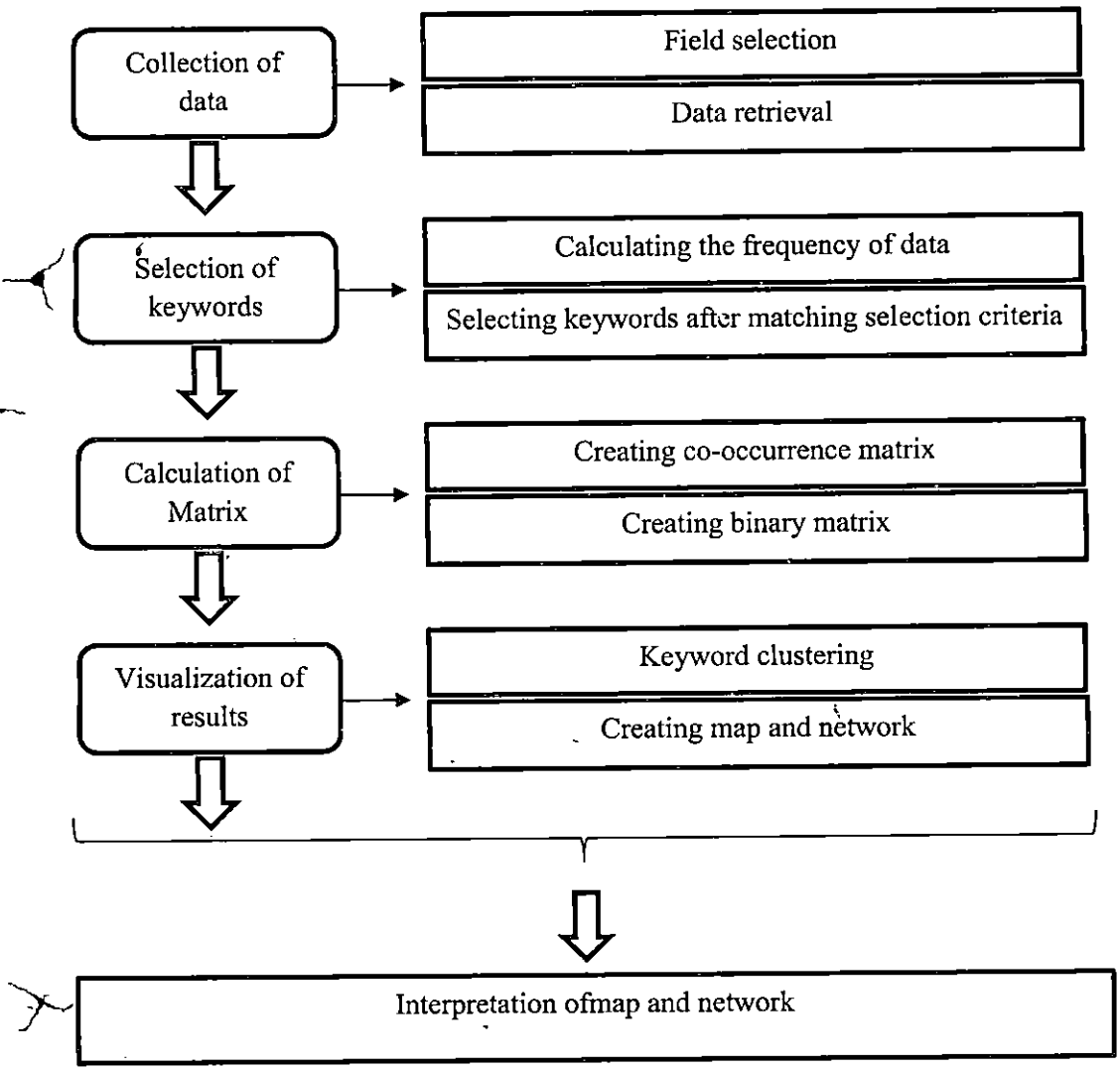


Figure 1: Steps of co-word analysis

4. Results and Discussion

Co-word Analysis

Co-word analysis is a technique of analyzing a set of documents to evaluate their strength of linkage by measuring the extent to which they share important keywords or terms (Rip and Courtial 1984). There are many techniques for co-word analysis. In this study, cluster analysis and social network analysis has been conducted.

Cluster analysis

We conducted the cluster analysis using VOSviewer after getting the graph of co-occurrence relationships among the 83 keywords (Figure 1). There is a weight that can be combined cluster and map together through visualization by VOSviewer. So we acquired detail information of a map with the help of VOSviewer's zoom and scroll functionality and got 83 keywords of digital library research in India and then divided them into 7 clusters. It indicated that the research fields of digital library in India are varied. . Each cluster has different number of subject keywords. The detail information of clusters is shown in Table 1.

As can be seen from table 1, cluster 1 has the largest number of keywords, indicating that the cluster 1 is the most centralized research field that pay more attention from the DL researcher in India. Cluster 1 contains 17 keywords, for example: semantic web e-journal, e-resource,ontology,aggregation, classification,ugcinfonet dl consortium,exchange, information architecture,html, hypertext; information management multimedia,representation, xml, consortium etc. So it is evident that research topics in cluster 1 are paid close attention to DL research in India. Cluster2 includes the researches on Catalogue, cd-rom, digital reference, extranet, federated model, federated search, harvesting model, harvesting, indexing, intranet, knowledge management, OPAC, protocol, searching, web server etc. Cluster 3 and 4 both contains 13 research topic i.e. conventional library, digital library, DL federation, education; implementation; information scientist; information technology; intellectual access; universal access, licensing and so on. Rest of the clusters also contain significant research keywords (See Table 1).

Table 1: 7 cluster of digital library research in India

Cluster	No. of Keywords	Selected keywords
1	17	Semantic web; e-journal; e-resource; ontology; aggregation; classification; UGC INFONET dl consortium; exchange; information architecture; html; http; hypertext; information management; multimedia; representation; xml; consortium;

2	15	Catalogue; cd-rom; digital reference; extranet; federated model; federated search; harvesting model; harvesting; indexing; intranet; knowledge management; opac; protocol; searching; web server
3	13	Conventional library; culture; digital information; digital libraries; dl federation; diverse community; governance; education; implementation; information scientist; information technology; intellectual access; universal access
4	13	Conservation; conversion; democratization; digital format; digital object; directory; dspace; gsdl; licensing; lifelong learning; open source software; preservation; transmission
5	9	Dublin core; interoperability; knowledge organization system; marc; metadata; metadata harvesting; oai; quality control; standard
6	8	Control; copyright; law; DRM; e-book; freedom; IPR; protection
7	8	Acquisition; google; maintenance; patron; reference service; selection; sharing; surrogate

4.1.2. Social network map

Fig 1 illustrates a co-word map with major keywords as nodes for the complete time period (i.e., 2007–2016). It shows the frequency of keywords and their relative co-occurrence with colors of different intensity to represent it as a heat map. Intense color indicates the frequency of keywords. In the center of each intense color, there is a keyword which is labelled in larger font size. This indicates that these keywords appeared more frequently and co-occurred with a higher number of other keywords in the literature. Keywords that have co-occurred more frequently are placed closer in the map.

The size of nodes can reflect the frequency of keywords: the higher frequency of keyword, the larger size of node. The thickness of line is proportional to the closeness of connections between two keywords, the thicker line between two words, the closer relationship is. As shown in Fig 1, the Metadata node has the biggest size representing Metadata has the highest frequency of keywords. Preservation, Open Source Software, Standard, Protocol, DL implementation, DL federation also have higher frequency.

The thicker lines between two keywords, such as Metadata, Preservation,

Conservation, Digital Object, DL Federation, Protocol, Standard, Dspace, Copyright reveals closer relationship. On the contrary, there found some keywords, for example- Digital reference, Information Technology, Consortium, GSDL, Licensing, have lower frequency that meansits size of node is small. And there is no line connecting to other keywords, such as- Quality Control, Patron etc. indicating these keywords are in the margin of research field.

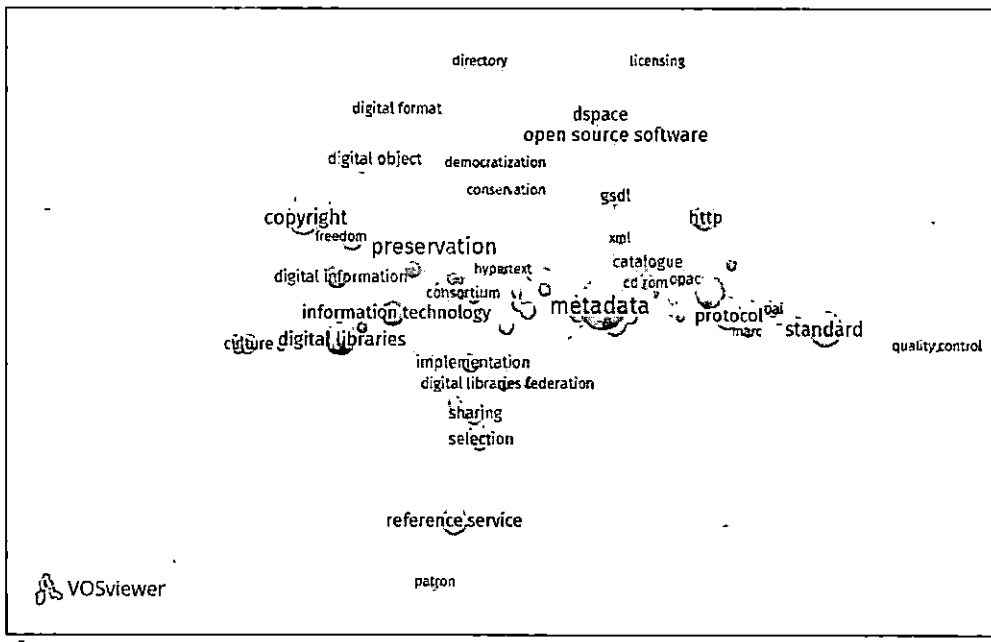


Figure 1: Social network map of co-occurrence matrix

A graph of density visualization also shown in Figure 3 to know more about the strength of relationship between the terms. Items are indicated by their label in the same way as in the network visualization. Each point in a map has a colour that depends on the density of items at that point. This color is generally in between red and blue by default. The larger the number of items in the neighborhood of a point and the higher the weights of the neighboring items, the closer the color of the point is to red. Conversely, the smaller the number of items in the neighborhood of a point and the lower the weights of the neighbouring items, the closer the color of the point is to blue. From the density visualization, we may directly find that Metadata, Open Source Software, Protocol, Preservation, Standard have a high density representing these keywords have a strong association with other keywords. And it is reasonable to assume that the higher the density, the more mature and well-developed study on the theme (An & Wu, 2011; Hu & Zhang, 2015). However, there some keywords in red area are fewer, most of keywords in green area. It depicts that thecore research fields are fewer, and many of these research fields tend to be juvenile and emerging.

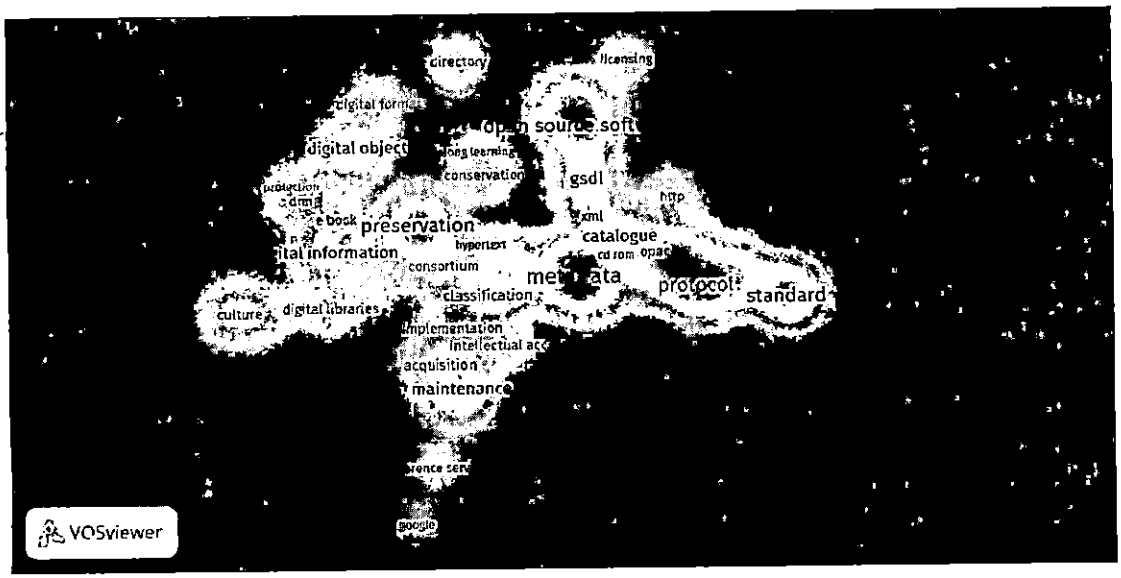


Figure 2: Density visualization of clusters

Co-author analysis

For conducting co-authorship analysis, the steps have been followed were: (i) retrieval of data; (ii) standardization of entries for authors (iii) network visualization and calculation of matrix; and (iv)interpretation of results. The result of co-author analysis are presented in co-authorship network.

Co-authorship networks

Co-authorship network is a social network in which the authors or organizations through participation in one or more publication through an indirect path have linked to each other; the strength of relations between publications makes similarity measures and thus the possibility of making cluster. Co-authorship network of authors involved links and nodes. Each node represents an author and the links between two nodes specifies co-authorship between the two authors.

To draw the co-authorship network of authors in VosViewer, the collaboration threshold by authors has been considered 10 (collaboration threshold $\geq$ 10 co-authored papers). Therefore from the total number of 2517 authors, 194 of them have meet this criteria. Therefore 194 authors remained in this analysis. Cluster analysis of researchers' co-authorship network indicates that this network includes 20 clusters in different colors. There are 16 prominent clusters composed of between 6 and 18 researchers (Figure 3). Two other smaller clusters have 4 researchers each, while two clusters have just 3 researchers.

The main and important clusters in the co-authorship network of authors are appearing in bright yellow color by presence of "Gaur, R.C.", "Bhattacharya, P.K.", "Babbar, P", "Dhiman, A.K." and others; bright pink color by presence of "Arora, J.", "Gopalakrishnan, S.", "Sinha, M.K." and others; purple color by presence of "Jain, P.K." and

"Lithikar, S." and others ; bright blue color by presence of "Das, A.K.", "Dutta, B", "Sen, B.K."; and finally bright purple color by presence of "Tripathi, M", "Sutradhar, B.", "Dhiman, A.K." and others (Figure 3). In regard to density view, researchers with more scientific relationship are located closer to each other. The highest density in the network belonged to Gaur, R.C., Jain, P.K., Arora, J., Singh, K.P., Das, A.K. and Lithikar, S. (Figure 4).

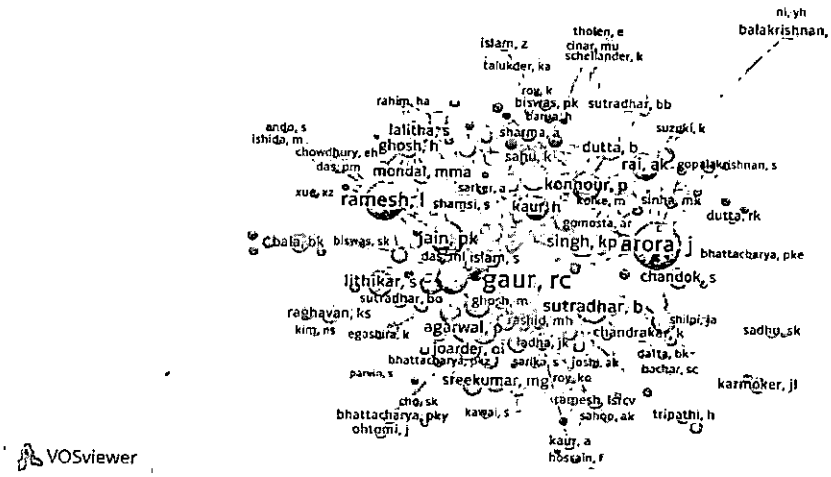


Figure 3: Lable view of co-authorship network of authors

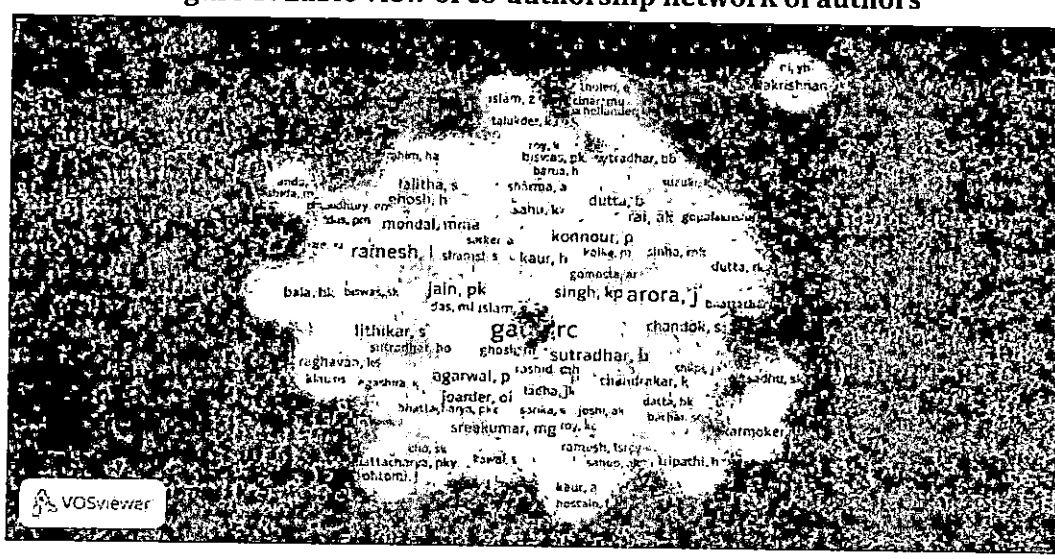


Figure 4: Density view of co-authorship network of authors

5. Conclusion

The purpose of this study was to intellectual structure of digital library (DL) field in India during the period of 2007-2016 using co-word analysis and co-author analysis. Over the period studied, the number of themes detected has grown owing to an increase in the number of papers published by the Digital Library researcher in India. Using the tools of VOSviewer, we obtain a clear understanding on the development of Digital Library research in India over the last decade. According to cluster analysis for 83 keywords shows that the research fields of Digital Library in India are varied. We identify 7 sub-domain cluster under the Digital Libraries knowledge domain, which represent a research direction. We also investigated the relationship between keywords directly from social network analysis. From the findings it is evident that above analysis, "Metadata", "Digital Preservation" and "Open Source Software", "DL Consortium", "Protocol", "Metadata Standard" are hot topics during the period of studied time. However, the evolution trends in the density visualization suggest that many research fields in Digital Library in India still immature. Co-authorship analysis also shows that divergent research direction has been influencing researcher to be involved in collaborative digital library research in India. Some researcher has more scientific relationship with other and thus contributing to emerge the more interesting and emerging theme in digital library research domain in India.

As an exploratory study, this study also has some limitations.First, we used Vosviewer software tools for analyzing the whole dataset. Generally VOSViewer aims to avoid having overlapping terms. If multiple terms are located very close to each other, only one of them will be shown, the others will not be shown. In that way, the software prevents terms from overlapping each other. When the user zooms in, more space becomes available in the visualization, and therefore more terms will become visible. So the overlapping terms remain invisible sometimes. Second, we considered only the last ten years (2007-2016) as the period of study.Notwithstanding its limitation, this study may have potential usefulness in uncovering the different research fields' intellectual structure within the Library and Information Science. To the best of researcher's knowledge, this study is the first of its kind in Digital Library field in India. Thus it may provide an opportunity to anticipate interesting developments in the investigated field with respect to key topics as well as predicting which topics are less likely to assume a central role in the literature in the near future (Cho and Khang 2006; Echchakoui and Mathieu 2008).

It may have potential usefulness in uncoveringthe different research fields' intellectual structure within the Library and Information Science. This evolution

providesan opportunity to anticipate interesting developments in these fields with respect to key topicsas well as predicting which topics are less likely to assume a central role in the literature inthe near future (Cho and Khang 2006; Echchakoui and Mathieu 2008).Identifying the main subject group and sub-group categories of keywords in the formof frequency distributions could uncover potential issues for future research. Though keywordscan succinctly summarise the content of all aspects of the reviewed articles and their usefulness for empirical research in consumer behaviour, keywords have been neglected as a research tool (Kevork and Vrechopoulos 2009). Finally, experts and novices could use these data, results and maps to understand the current "state of the art" into the Digital Libraries and to predict where future research will lead. This study will provide a panoramic view of DL research for DL researchers, practitioners and educators. It can be used to create a visual knowledge map of DL research, and can also be used to develop a new DL curriculum. This study will also provide a basis for understanding the advances and for anticipating future innovation pathways of DL field in India.This research is just a preliminary and still has limitations. Further research need to action in the future. For example, some research methods, such as the network characteristics of centrality, density, and the core-periphery structure, K-means algorithm, Co-eficient will be a necessary to apply in the future research. In addition, to attain comprehensive perspective of Digital Library research in India, it is essential that in future studies, evaluate other local scientific materials such as monographs, books, and dissertation theses as well as articles published in journals are not indexed in WoS database.

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NEED OF DIGITAL LIBRARIANS IN UNIVERSITY LIBRARIES OF INDIA : A CRITICAL ANALYSIS

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Abstract: This paper discusses the concept of digital library and digital librarian. A comparison between the concept of blended librarian, embedded librarian and digital librarian has been presented. Need and functions of digital librarian have also been elaborated. The role of a digital librarian in university libraries has also been highlighted in Indian context. The skills required for digital librarian have also been mentioned which are based on literature review. A sample survey of university libraries of Rajasthan and Haryana has been made to have stock of the situation about availability of information scientist and professional librarians.

Keywords : Digital Librarian, Embedded Librarian, Blended Librarian, Digital Library, Digital Curation, Digital Competency, RLUK, Digital Librarian Skills, INFLIBNET, NISCAIR

1. INTRODUCTION

Today the changes which are taking place in nature and concept of librarianship are the outcome of deluge of information which is being generated digitally and preserved locally or at the remote locations. This has also effected the role of librarians in libraries. The rapid technological advancements have urged upon for specific knowledge of digital technology for librarians so that effective services may be provided by them in libraries. In present perspective the digital libraries and digital repositories are the focused areas of many academic and research institutions. Therefore these such trends require digital competencies for librarians to cope up with the digital work and interface of libraries. Thus emerging concept of digital libraries has yielded the need for digital librarians.

A survey by Youngok Choi and Edie Resmussen[1] reveals that in USA the concept and demand for digital librarianship was growing in 2000. The titles used for digital librarians were including; digital initiative librarian, digital project manager, director of digital library development, director digital library initiatives, head of digital project department.

2. CONCEPT OF DIGITAL LIBRARY

Before analyzing the concept of digital librarian it would be pertinent to visualize various aspects of digital library concept which have emerged now. In general

terms a digital library may be attributed as the library which has significant number of resources in digital format and ensures the accessibility of the digital resources through web enable devices and computers. The digital contents may be hosted locally or at remote locations which may be accessed through web enable devices. Thus the activities of digital library may include digital image processing and digital data collection, preservation of digital data and presentation of digital data, management of digital data, metadata architectures and implementations. The library collection may include magazines, newspapers, books, journals and other reference material etc. in digital format and access these can be ensured through web enable devices.

Wikipedia[2] defines the digital library in similar terms and adds further that electronic library is a type of information retrieval system.

Quan Zhou[3] has also identified some additional characteristics of digital libraries as; Distributed information resources management; highly shared information resources; intelligent retrieval technologies; information services without space and time limitations.

3. PURE DIGITAL LIBRARY AND HYBRID LIBRARY

There is a difference between pure digital libraries and hybrid libraries. Pure digital libraries have only digital data at various locations however its accessibility is provided to the users through Internet and other ICT devices. DDB: German Digital Library is one of the example which also has Beta version .

The traditional libraries which have print collection and maintaining it with digital data collection and providing access of digital data through web enable devices, are falling under the category of hybrid libraries.

Wolfgang Ratzek[4] has clarified this issue by stating that pure digital library exists only on Internet, it is therefore a virtual library. The user conducts his/her online research via an IT based user- interface. The user in principle does not know where the original data source is located.

4. CONCEPT OF DIGITAL LIBRARIANSHIP

In general terms the digital librarianship can be defined as the knowledge and skills needed to design and implement digital information services. Digital librarian can be a person charged with duties to take forward to the library in respect of technological advancement specially in digital data creation, maintenance and its accessibility to the users. The digital librarian may also be charged to create and

plan digital infrastructure and environment in libraries. Jane Barton[5] mentioned that digital librarians must thrive on change. They should read constantly but selectively and experiment endlessly. They need to love learning, be able to self teach and be inclined to take risks. They must have keen sense of both the potential and pitfall of technology.

5. JOB WHICH CAN BE ASSIGNED TO DIGITAL LIBRARIAN

Literature review on this issue reveals that many opinions have been expressed about the functions of digital librarians. Quan Zhou[6] is also among them who has also highlighted functions of a digital librarian. On the basis of the varied opinions , the job of a digital librarian may be as follows:

1. Selection, acquisition, preservation, organization and management ofdigital collection ;
2. Designing the technical architecture of digital library;
3. To describe the contents and attributes of items (metadata);
4. Planning, implementation and support for digital services such as information navigation, consultation and transmit services;
5. To establish friendly user interface over network ;
6. To setup relative standards and policies for the digital library;
7. To design, maintain and transmit add valued information products;
8. To protect digital intellectual property in network environment and to ensure informal security;
9. To learn constantly and to interact with IT professionals ;
10. To make experimentations on IT to enhance and develop the digital library services in library.

6. Difference between Digital Librarian and Blended Librarian, Embedded Librarian

The library literature reveals that the concept of digital librarian is growing fast however presently two other terms blended librarian and embedded librarian are also in vogue to denote the modern librarians who can cope with the information competency issues and serve the libraries as these require.

Conceptually both blended librarian and embedded librarian seem same but some of the attributes are different, if functional aspects of these are compared :

1. The blended librarianship requires combination of skill set of traditional librarianship and information technology know how which can be applied to serve and educate library users. Specific subject needs of library users can also be attended by blended librarians to satisfy the information requirements in various areas of knowledge. In short blended librarianship relates to old and new service models of academic librarianship. Blended librarian having skill of print and online technology can help the users in meeting their information requirements.

2. The embedded librarianship focuses more on personal service to research groups to satisfy their information needs. To provide this kind of personal service the information expertise along with good subject expertise of particular research areas are required. Such library professionals work with research teams and are associated with research or project including its outcome. They have to customize the information and technology as per specific need of research group. Thus the role of embedded librarian is very important to support research. The concept of embedded librarian is popular in health science and clinical libraries of UK and USA.

   - The concept of Research Libraries UK (RLUK)[7] is a new development in which 37 leading and most significant research libraries of UK and Ireland are members and these are projecting requirements which may be fulfilled by embedded librarians. Librarian as an information expert has to take care of researchers or a group of researchers.

3. The concept of digital librarian is some different as far as digital literacy is concerned. In digital librarianship more emphasis is given on digital competency and expertise to deal with digital aspects of library. The digital librarian is more technology driven and expert as compared to blended and embedded librarian.

Analyzing this fact Jim Del Rosso and Cory Lampert[8] have opined that though the persons like reference librarians, instruction librarians, selectors and collection development librarians, cataloguers, subject specialists are also making digital interactions in libraries today but the role of digital librarians is different than those people.

Another study by Evgenia Vassilakaki and Valentini Moniarou-papaconstantinou[9] has similar views as they say that trained digital librarians will be able to cope up with the challenges posed by managing a digital library. Successful digital librarians need to develop partnerships, communicate beyond professional boundaries and promote information literacy programs across institution.

7. SKILLS REQUIRED FOR DIGITAL LIBRARIANS IN ACADEMIC LIBRARIES

Literature review reveals that there are varied opinions on this issue and with the new changes in digital technology and information and communication technology the required skills of digital librarians are changing accordingly. Library professionals who are advocating for digital librarians opine that the rapid rate of change in technology meant that certain skills might be obsolete in a short time as such continuous learning and experiments are required by digital librarian to cope up with the situation.

Linda Marion (2001)[10] in her study on the job skills , analyzed the job advertisements in USA , and found that computer related skills and behavioral characteristics were included and required for librarian's job including digital librarian.

In 2005 Quan Zohu[11] Came forward and proposed different concept of digital librarian and advocated different skills and roles of digital librarians. Another study in 2009 by Youngok Choi and Edie Rasmussen[12] pointed out the skills required for digital librarians in academic libraries of USA and they found that a digital librarian was a emerging position in academic libraries and digital librarian was focused position in job advertisements in USA.

Another study by Jeonghyun Kim, Edward Warga and William Meon[13], focused on skills by investigation of job advertisements to identify competencies required for individuals working in the digital curation field. In their study they found that qualified work force was required in the field of digital curation in the academic library job market. On the basis of preferred skills found in job announcements, areas of knowledge and skills expected for professionals in digital curation the following two were preferred :

1. Ability to work in an information technology intensive environment appeared most frequently . This includes knowledge of multiple operating systems and web architectures including Unix /Linux, Windows and LAMP, programming and scripting, such as Java, PHP, Perl, and web development skills, such as HTML and CSS. Another facet of this area includes the ability to work with using relational databases such as Oracle or my SQL, data analysis tools like NVivo, Stata, SAS and SPSS and specifications SQL, XML, XSLT, RDF, OWL

2. The technical, organizational and procedural standards were second preference in which the familiarity and knowledge of various metadata standards such as MARC, Dublin Core, METS, MODS, and PREMIS were required.

On the basis of above mentioned elaboration it can be found that latest knowledge of Computer and ICT, digital data creation and preservation with data protocols and networks, are required for a digital librarian. In fact this requires specific knowledge and skill in computer literacy for which a computer science literate person is required who should have expertise in computer technology along with various programs and data protocols and its related aspects. Thus the skills described above may be considered for a digital librarian.

8. NEED OF DIGITAL LIBRARIANS FOR UNIVERSITY LIBRARIES IN INDIA

1. There is a need of digital librarians in academic libraries especially in big university libraries in India. At present the university libraries are interacting with digital data technology and other advancements in ICT. The programs such as e-ShodhSindhu, Sodhganga, Sodhgangotri, university repositories and digital library of India, are such programs which are focusing on the need of digital librarians for university libraries. Digital India program has also been launched by Indian government with the vision to transform India into a digitally empowered society and knowledge economy which also include education as focused area.
2. In this context it may also be considered that universities are referring to the UGC qualifications as contained in UGC-Notification dated June 30, 2010[14] for appointing Assistant Librarians in university libraries for entry level job for which, these require knowledge of computerization work in libraries and it does not include the specific competencies and skills as required for digital librarians in present perspective.
3. The need of IT professional was also realized at the level of University Grants Commission of India after establishment of INFLIBNET, when the program of modernization of university libraries was started in 1995-1996 and the provision for the post of "Information Scientist" as computer skilled professional was made by UGC for university libraries which was covered under this program. But the Information Scientists were not appointed by most of the universities in India.

9. AVAILABILITY OF INFORMATION SCIENTIST AND PROFESSIONAL LIBRARIANS IN UNIVERSITY LIBRARIES ESTABLISHED BEFORE 1995 IN RAJASTHAN AND HARYANA

A sample survey based on website search of relevant universities was carried out on 14thAugust, 2016 to take the stock of the situation of availability of Information Scientist and professional librarians in libraries of universities established before 1995 in two nearby Indian States , Rajasthan and Haryana. The information available on websites of relevant universities was also supplemented by telephonic enquiry.

The information available is presented in Table - A (for universities of Rajasthan) and Table-B includes (information of universities of Haryana).

Table–A Information as available on 14-8-2016 about universities established before 1995 in Rajasthan :

S. No.	Name of University	Year of Estt.	Has professional Librarian	Has Information Scientist in library
1.	Jai Narain Vyas University, Jodhpur http://www.jnuv.edu.in	1962	No	No
2.	Maharshi Dayanand Saraswati University, Ajmer www.mdsuajmer.ac.in	1987	No	No
3.	Mohan Lal Sukhadia University, Udaipur htpp://www.mlsu.ac.in	1962	No	No
4.	University of Rajasthan, Jaipur, www.uniraj.ac.in	1947	No	No
5.	Vardhman Mahaveer Open University, Kota www.vmou.ac.in	1987	*	No

*Professor Dept. of Library and Information Science is working as Director

Table-B Information as available on 14-8-2016 about universities established before 1995 in Haryana:

S. No.	Name of University	Year of Estt.	Has professional Librarian	Has Information Scientist in library
1.	Kurukshetra University , Kurukshetra www.kuk.ac.in	1956	No	No
2.	Maharshi Dayanand University, Rohtak www.mdurohtak.ac.in	1975	yes	yes
3.	Chaudhary Charan Singh Haryana Agriculture University , Hissar http://www.hau.ernet.in	1970	No	No

The data analysis of these universities reveals that none of the university in Rajasthan included in survey, has Information Scientist in university libraries. Universities of Rajasthan included in survey also does not have the Professional Librarians. However, in Vardhman Mahaveer Open University, Kota, Professor, Department of Library Science , is working as Director of library who is also not a regular appointed librarian.

As far as data analysis about universities of Haryana included in survey reveals that one university MD University Rohtak library, has Information Scientist and professional librarian. The other two universities do not have regularly appointed professional librarians and Information Scientists in library. Thus sample survey is indicative that the university libraries are requiring professional staff as well IT professionals such as digital librarians to carry on the digitization work in university libraries.

10. SUGGESTIONS FOR FUTURE IN INDIAN CONTEXT

- One person from Computer Science having digital competency in latest digital technology and ICT may be appointed in university libraries especially in big university libraries.
- This can be done even bifurcating the posts of Assistant Librarians and one post may be earmarked for Information Scientist /Computer Scientist.
- S R Ranganathan[15] has also advised that in big libraries the posts may be distributed among various subject fields like the distribution of teaching posts in an educational institution among several subjects.
- UGC India should also create the post of Information Scientist or Assistant Librarian Digital Services which should have qualifications and competencies as suggested by Jeonghyun Kim et-al and discussed in foregoing para 4 of this paper including latest developments and requirements in digital skills .
- Library and Information Science Courses should be redesigned and latest digital technology and ICT may be included in syllabus by universities in India.
- Different specialized courses may be designed for computer engineers or computer science persons in which library and information science techniques along with digital literacy and technology required for digital librarians, may be included so that such persons may also join these courses.
- In India such course' Associateship in Information Science' has been designed by National Institute of Science Communication and Information Resources (NISCAIR) in which persons having B.E. or M.B.B.S degree can also join this course in addition to persons having degree in other disciplines also. But there is a need of more such courses in India.

- In India the services of computer expert persons provided by NIC (National Informatics Centre) to various government departments have brought radical change in pace of ICT implementation in government departments. This may be exemplary and such system may be developed by UGC or INFLIBNET to provide services of information scientist or digital librarians to university libraries in India.

11. CONCLUSION

The digital literacy and digital librarians are need of today. It is essential because a lot of amount is incurred on e-resources and on creation and maintenance of digital data and its related activities. The person having digital competency and IT expertise will be able to handle these activities in a better way and will also help in creation of infrastructure and organization of new techniques /devices in university libraries. Other staff of library may deal with other technical, organizational, behavioral and service aspects of library which also strengthen the level of services to the users in libraries. The university libraries may earmark one post of assistant librarian for appointing computer IT person as digital librarian.

Besides INFLIBNET and UGC may evolve the system for providing services of digital librarians in big university libraries on the lines of National Informatics Center as described in this paper. New skills as required for digital librarians should also be included in syllabus of library and information science courses in Indian universities. Besides there must be a uniform syllabus for library and information science courses in India and UGC can make such efforts for its implementation. Separate Associateship courses in library and information science may be designed for IT or computer science persons who can join these to have the library and information science skills as required to serve as digital librarians in universities and other institutions.

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"PARADIGMS OF DIGITAL LIBRARY, E-RESOURCES, OPEN ACCESS AND INFORMATION AND MEDIA LITERACY" Open access to knowledge and information

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Abstract: Open access to information and knowledge is a key contributor in provisioning universal access to information and knowledge. Thus, the open access movement is gaining momentum in developed countries which already have necessary information infrastructure. Free to read and free to re use In the information society, free flow of information is a fundamental principle for bridging the knowledge gaps between privileged and under-privileged communities. Social inclusion and economic empowerment are also achieved in a society where citizens have universal access to information and knowledge, ranging from public information to specialized or customized information related to ones' profession, vocation or culture. The emerging economies amongst the developing countries are not far behind in building up necessary information infrastructure, essential for sustainable economic development. These emerging countries, however, have limitations in terms of bridging the digital divide within their societies, due to the co-existence of marginalized and privileged communities. With the availability of advanced information and communication technologies (ICTs) and by building up necessary information infrastructure in South Asia, particularly in India, this sub-region becomes an active contributor to global open access literature, a contribution, almost proportionate to its flow of scholarly literature through subscription-based channels. For several thousand years, South Asian literature has been developing, explicit with knowledge of the time.

Keyword: Open access to knowledge - Free to read and free to re use, FOSS - free and open source software.

1. Introduction

Open access to information and knowledge is a key contributor in provisioning universal access to information and knowledge. Thus, the open access movement is gaining momentum in developed countries which already have necessary information infrastructure. Free to read and free to re use

In the information society, free flow of information is a fundamental principle for bridging the knowledge gaps between privileged and under-privileged communities. Social inclusion and economic empowerment are also achieved in a society where citizens have universal access to information and knowledge, ranging from public information to specialized or customized information related to ones' profession, vocation or culture.

The emerging economies amongst the developing countries are not far behind in building up necessary information infrastructure, essential for sustainable economic development. These emerging countries, however, have limitations in terms of bridging the digital divide within their societies, due to the co-existence of marginalized and privileged communities. With the availability of advanced information and communication technologies (ICTs) and by building up necessary information infrastructure in South Asia, particularly in India, this sub-region becomes an active contributor to global open access literature, a contribution, almost proportionate to its flow of scholarly literature through subscription-based channels. For several thousand years, South Asian literature has been developing, explicit with knowledge of the time.

The Internet has fundamentally changed the practical and economic realities of distributing scientific knowledge and cultural heritage. For the first time ever, the Internet now offers the chance to constitute a global and interactive representation of human knowledge, including cultural heritage and the guarantee of worldwide access. We, the undersigned, feel obliged to address the challenges of the Internet as an emerging functional medium for distributing knowledge. Obviously, these developments will be able to significantly modify the nature of scientific publishing as well as the existing system of quality assurance. In accordance with the spirit of the Declaration of the Budapest Open Access Initiative, the ECHO Charter and the Bethesda Statement on Open Access Publishing, we have drafted the Berlin Declaration to promote the Internet as a functional instrument for a global scientific knowledge base and human reflection and to specify measures which research policy makers, research institutions, funding agencies, libraries, archives and museums need to consider.

2. Goals

Disseminating knowledge is only half complete if the information is not made widely and readily available to society. New possibilities of knowledge dissemination not only through the classical form but also and increasingly through the open access paradigm via the Internet have to be supported. We define open access as a comprehensive source of human knowledge and cultural heritage that has been approved by the

scientific community. In order to realize the vision of a global and accessible representation of knowledge, the future Web has to be sustainable, interactive, and transparent. Content and software tools must be openly accessible and compatible.

3. Definition of an Open Access Contribution

According to Alexandria Proclamation of 2005 describes information literacy and lifelong learning as the "beacons of the Information Society, illuminating the courses to development, prosperity and freedom. Information literacy empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social inclusion in all nations."

Establishing open access as a worthwhile procedure ideally requires the active commitment of each and every individual producer of scientific knowledge and holder of cultural heritage.

Open access contributions include original scientific research results, raw data and metadata, source materials, digital representations of pictorial and graphical materials and scholarly multimedia material.

Traditional knowledge, presently available amongst indigenous people in folklore or other forms, is now being explored and documented. The digitization of century-old publications and rare documents is being carried out in different institutions across this sub-region to preserve them and make them accessible through networks of digital archives. E-content is are being produced by members of different communities, facilitated by certain development organizations, including the apex higher education agencies (viz., University Grants Commission, India; Higher Education Council, Pakistan); apex research councils (e.g., Council of Scientific and Industrial Research, India; Indian Council of Medical Research, India), and grassroots-level civil society organizations (e.g., OneWorld South Asia). India has spearheaded the open access movement in developing countries since the last decade upscaling print-based scholarly journals into open access electronic journals, and establishing a number of open access repositories, both at national and institutional levels embracing free and open source software (FOSS). Establishment of open courseware and cross-archive search services are new fronts of open access initiatives.

Indian information professionals are experimenting with open source software in the establishment of institutional repository (IR) systems in local libraries, using Greenstone, D Space or E Prints software. Once an IR is successfully implemented in the local library setup, it is then upscaled to institution-wide application through campus networks or intranet. Similarly, it may open up to wider audiences once the authorities of the institution are convinced. With the availability of dedicated information infrastructure combined with 24X7 broadband connectivity and the national educational grid, some institutions and universities created institutional repositories for wide dissemination of their own scholarly literature. Some open access repositories are specially created to diffuse intellectual outputs of the country in the form of electronic theses and dissertations: Vidyanidhi, ETD@IISc in India and the Pakistan Research

Repository are examples. Other national level open access repositories provide all kinds of scholarly materials such as research papers, conference papers, technical reports, presentations, photographs, news clippings, and etheses on particular disciplines. The OpenMED@NIC and Librarians' Digital Library are also examples of this kind.

In the wake of the open access movement, some policy frameworks have already been established by member communities to foster inclusive, plural and development-oriented knowledge societies. A number of open access declarations/ statements were made during the past decade, where the world's leading research institutions agreed on the open access mandates. An indicative list of major open access statements or declarations is given in Table 1. The United Nations-backed World Summit on the Information Society (WSIS) strongly supported open access to information and knowledge. This confirms that member countries of the United Nations will take appropriate strategic decisions to bring scholarly literature, produced from public funded research initiatives or state-supported researchers, under the umbrella of open access. Annexure illustrates the WSIS Declaration of Principles and Plan of Action on access to information and knowledge. The plan of action relevant to long-term preservation of cultural contents, creation of local content and open access to scholarly literature is also shown in Annexure.

Information literacy enables people to interpret and make informed judgments as users of information sources, as well as to become producers of information in their own right. Information literate people are able to access information about their health, their environment, their education and work, empowering them to make critical decisions about their lives, e.g. in taking more responsibility for their own health and education.

In a digital world, information literacy requires users to have the skills to use information and communication technologies and their applications to access and create information. For example, the ability to navigate in cyberspace and negotiate hypertext multimedia documents requires both the technical skills to use the Internet as well as the literacy skills to interpret the information.

4. Open access contributions must satisfy two conditions:

1. The author(s) and right holder(s) of such contributions grant(s) to all users a free, irrevocable, worldwide, right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship (community standards, will continue to provide the mechanism for enforcement of proper attribution and responsible use of the published work, as they do now), as well as the right to make small numbers of printed copies for their personal use.

2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in an appropriate standard electronic format is deposited (and thus published) in at least one online repository using suitable technical

standards (such as the Open Archive definitions) that is supported and maintained by an academic institution, scholarly society, government agency, or other well established organization that seeks to enable open access, unrestricted distribution, inter operability, and long-term archiving.

5. Supporting the Transition to the Electronic Open Access Paradigm

- Our organizations are interested in the further promotion of the new open access paradigm to gain the most benefit for science and society. Therefore, we intend to make progress by
- Encouraging our researchers/grant recipients to publish their work according to the principles of the open access paradigm. · encouraging the holders of cultural heritage to support open access by providing their resources on the Internet.
- Developing means and ways to evaluate open access contributions and online journals in order to maintain the standards of quality assurance and good scientific practice.
- Advocating that open access publication be recognized in promotion and tenure evaluation.
- Advocating the intrinsic merit of contributions to an open access infrastructure by software tool development, content provision, metadata creation, or the publication of individual articles.

6. Development of open access

The development of the number of active open access journals and the number of research articles published in them during the period 1993–2009 is shown in the figure above. If these gold open access growth curves are extrapolated to the next two decades, the Laakso et al curve would reach 60% in 2022, and the Springer curve would reach 50% in 2029 as shown in the figure below (the reference provides a more optimistic interpretation which does not match with the values shown in the figure).

7. Conclusion

We realize that the process of moving to open access changes the dissemination of knowledge with respect to legal and financial aspects. Our organizations aim to find solutions that support further development of the existing legal and financial frameworks in order to facilitate optimal use and access.

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PRESERVATION METADATA: IMPLEMENTATION STRATEGY

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Abstract: The production of digital information sources in variety of formats has led to accelerated search for suitable methods for managing digital information sources. Metadata plays an important role in managing the digital information. His paper tries to give brief idea about PREMIS: Preservation Metadata Implementation Strategy

Keywords: Digital Library, Metadata, PREMIS

1. INTRODUCTION

There is tremendous increase in the production of digital form of information resources which exist in a wide variety of formats ranging from simple text to complex multimedia resource. Technological trends have resulted in creation, access and use and preservation of information resources in different forms. Growing shift from paper to digital content and continuous pace of developments in digital technology have opened up new opportunities and challenges which have resulted in growth, developments and research in digital library and digital archives around the world. This has led to accelerated search for suitable methods of managing digital information sources. Though main aim of managing digital information involves information discovery and use, there is also need for the preservation of digital object for the future use or as long it is in use. Metadata plays an important role in managing digital content. The role of metadata is to facilitate access to relevant information regardless of the type and location. Application

of metadata can minimize the possibility of information being inaccessible due to lack of proper organization or lack of having proper description. Metadata is structured information that describes, locates, and makes it easy to access the information, use or manage an information resource. There are different metadata depending on the functions they perform like structural, technical preservation, rights and administrative metadata.

Preservation Metadata supports and documents the digital preservation process. It is an essential component of most digital preservation strategy. It stores technical details on the format, structure and use of digital content, hosting of all functions performed including change and decisions, authenticity of information such as technical features, responsibility and right's information applicable to preservation activities. Digital content produced is technology dependent. Means and access to the digital objects need to be documented properly. Fragile nature of digital objects makes them mutiliated, corrupt or altered easily. The changes need to be documented or validated. To overcome such problems & copyright related issues and to make the digital objects self documented Preservation metadata is necessary. In order to maintain standard framework for preservation of digital objects many works and studies have been done. PREMIS is one such framework which provides guidelines for digital preservation.

Preservation Metadata: Implementation Strategy is an International working group sponsored by OCLC and RLG from 2003-2005 to work on the issues and challenges faced during preservation of digital resources. It is a common model for organizing/thinking about preservation metadata. It developed a data dictionary of elements needed to support the preservation of digital objects. A standard for exchanging information packages between repositories. A guideline A checklist. It provides information to manage a resource for preservation purposes with respect to technical characteristics of the digital object, information about actions on an object, structural and derivative relationships, rights metadata associated with preservation (Guenther 2009)

2. HISTORY:

Digital collections are mostly integrated and are linked from a single system. Persistence of digital content, long term access and preservation of digital content are important aspects in digital repositories. Addressing the issues related to them is a big challenge for the digital library, archive or an institution dealing with a digital repository. Digital preservation is one of the strategies employed to overcome these challenges. Digital preservation is described as range of activities

required to ensure that digital objects retain quality and remain accessible for as long as they are needed. Common strategies employed are normalization, migration and emulation. Long term preservation or digital preservation is not a simple task because of involvement of technical and organizational issues. Many studies, initiatives and projects have been initiated to address the issues related to preservation in general and the involvement of metadata in particular. Many standards have been developed. One of the standards developed for the purpose is OAIS (Open Archival Information System) which acts as a reference model and was developed by the Consultative Committee for Space Data System to provide a framework for the standards related to long term preservation within science community. It provides conceptual idea for the roles and activities that humans and computers systems are respectively to play and the workflow or process involved. Many works, studies have been done based on this model and have examined the potential of metadata in preservation activities. Many national and International organizations have initiated studies specially designed to address the potential of metadata in preservation activities and which provide much needed information to support the digital preservation strategies. These include

- The national library of Australia's preserving Access to Digital Information (PADI) initiative
- European Research projects including NEDLIB (Networked European Deposit library), CEDARS (Consortium of University research libraries)
- US-Research library Group (RLG) and Online Computer library Center (OCLC)

Though these initiatives worked towards the common attributes, the fact that wide range of the functions that preservation metadata is expected to support and the involvement of different kinds of metadata that are required to support different digital preservation strategies and the evolution of metadata standards over the time calls for unified standard. In early 2000 RLG and OCLC formed a working group based on OAIS model to produce unified metadata framework to Support the Preservation of Digital objects. Following publication of the Metadata framework, OCLC & RLG commissioned another working group called Preservation metadata Implementation Strategies, to investigate the issues implementing preservation metadata in more detail. The group used earlier initiatives as a blocks for developing PREMIS. The focus of the group was on practical aspects of implementing preservation metadata in digital preservation systems with following objectives as pointed by Guenther, R 2009

- Identify and evaluate strategies for encoding, storing, managing and exchanging preservation metadata

- Define implementable, core preservation metadata with guidelines/ recommendations for management and use.
- The major developments

PREMIS was produced from an international, cross-domain, consensus-building process and is applicable to any preservation effort (Guenther 2009). The working group has produced a report called PREMISE data dictionary for Preservation Metadata. The PREMIS data dictionary is the first comprehensive technical specification for preservation metadata. (Guenther 2009) It defines what a preservation repository needs to know. The focus is on repository system and its management related activities like repository design, repository evaluation and exchange of archived information packages among preservation repositories. PREMIS Data dictionary is a core set of semantic units that repositories should know in order to perform the preservation functions like ensuring the digital objects remain viable and render able, the objects are not altered and the changes if any are documented properly. It defines only that metadata commonly needed to perform preservation functions of all materials. It is considered as a subset of Preservation Metadata. It recommends placing controlled vocabularies in a common space or service where a vocabulary can be re used by multiple repositories. It assumes that implementation decisions need to be made and does not dictate syntax although an XML schema is provided.

3. STRUCTURE OF PREMIS

PREMIS is based on the idea of implementation. The working group developed a simple data model to organize the semantic units. Semantic unit is a piece of information or knowledge. Semantic units "camel case" strings. Words are not separated by spaces but by capital letters. Some units don't hold a value themselves but exist to group related to semantic units. Such units are called containers. Containers provide hierarchical structure.

Eg The container 'objectIdentifier' is used to group the two subunits 'objectIdentifierType' and 'objectIdentifierValue'

Application of PREMIS includes five entities that are identified in PREMIS data Dictionary- intellectual entities, Objects, Events, agents and rights to potential metadata sources identified in an institutional repository preservation model. Each semantic unit defined in the Data dictionary is a property of one of the entities in data model. (Guenther 2009) (Prasad n.d.)

4. PREMIS DATA MODEL

As described in Data Dictionary for Preservation Metadata: PREMIS version 2.2 (Guenther 2009) and (P. Caplan 2009)

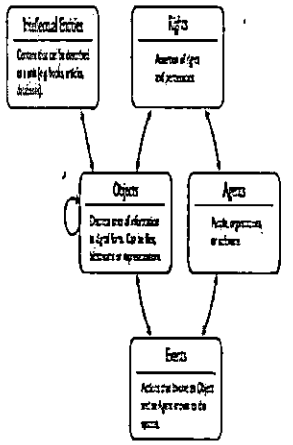


Figure 1: PREMIS data model

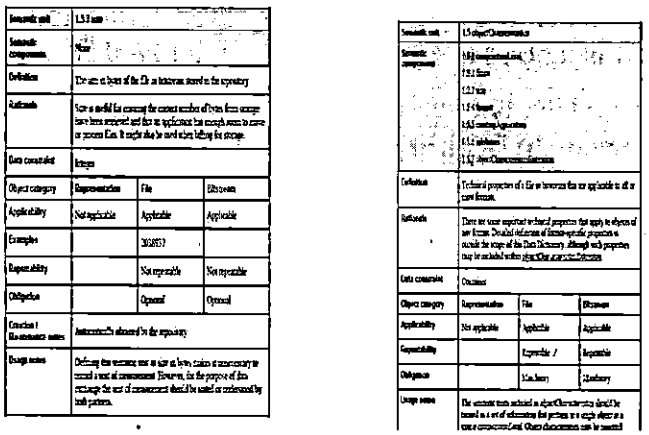


Figure 2: Sample data dictionary for Semantic unit

In the model entities are represented by boxes. Relationships between entities are represented by arrows. The direction of the arrow indicates the direction of the relationship linkage as it is recorded in the preservation metadata. For ex, the arrow pointing from the Right entity to the Agents entity means that the metadata associated with the Rights Entity includes a semantic unit recording information about the relationships with an agent. Object entity has the arrow pointing back to itself indicating the objects can be related to other objects. Except Object entity no other entities have such linking.

The entities are defined

I) **INTELLECTUAL ENTITY:** A set of content that is considered a single intellectual unit for purposes of management and description. Intellectual entities are bibliographical entities.

Ex: A particular book, map, photograph, website, database. Intellectual entities can include other intellectual entities. Ex: A book with images, website with a web page.To preserve a copy of online book ISBN of the book as a link to the Intellectual entity.

II) OBJECT: Is a discrete unit of information. Objects are actually stored and managed in the preservation repository. The information that can be recorded includes: A unique identifier for the object. The size of the object, The format of the object, which can be specified directly or by linking to a format registry, The original name of the object, Information about its creation.

Objects are divided into 3 types Fie objects, Representation Object, and Bitstream Object

a) File Object: It is just a file Eg: A computer file like JPEG

b) Representation File: The set of all file objects needed to render an Intellectual entity.Eg: Home page of an Institutional website.

c) Bit stream File: Bitstream objects are subsets. A bitstream object is defined as data within a file that have common properties for preservation purposes and cannot stand alone without adding a file header

III) EVENTS: This entity covers an accurate and trustworthy record of events that are important for maintaining the digital provenance of an object which in turn is important for demonstrating authenticity of the object. The information to be recorded involves: The type of the event, a unique identifier for the event, the date and the time the event occurred, a detailed description of the event,

IV) ACTIONS: Are actors that have roles in events and in rights statement. Agents can be people, organizations or software applications.

V) RIGHTS: This entity collects information about rights and permissions that are directly relavant to preserving objects in the repositories. Information to be recorded includes Whether the basis for claiming the right is copyright, license or statute., More detailed information about the copyright status, license terms.

Most of the PREMIS elements are designed to be supplied automatically by the preservation repository applications. But some information like inhibitors,

Provenance and significant characters are to be recorded

5. HOW PREMIS Is USED (P. Caplan 2009)

The data dictionary defines what a preservation repository needs to know. The focus is on the repository system and its management & not the people involved in the process. The primary use of the PREMIS is for repository design, repository evaluation and exchange of archival information packages among preservation repositories. PREMIS is used a s a guideline for the designing or developing preservation repository. Those designing and or developing preservation repository software application should use PREMIS as a guideline for what information should be obtained and recorded by the application or otherwise known to repository management. Those who are planning to implement a preservation repository can use as checklist for evaluating software. It is use along with other metadata standards like METS, MOD to record provenances and other information that supports sustained access.

6. ADVANTAGES:

Systems which support the PREMIS Data dictionary are better able to preserve information resources in the long term.

PREMIS acts as a guideline for those designing and/or developing preservation repository software applications for what information should be obtained and recorded by the application.

It is used as a checklist for evaluating software for those who are planning to implement a preservation repository.

In case of Export and import of stored information packages: It provides common set data elements that can be understood by the exporting and importing repository if the PREMIS XML schema is used.

It helps a repository to implement a preservation policy.

PREMISE helps to ensure the future use of produced information in digital content, verification of the accuracy of the digital information.

PREMIS has contributed preservation metadata resources to the digital preservation community that are: a)Immediately and freely available, b) Oriented toward practical implementation, c)Supported by implementation tools (XML schema), d) Supported by a long-term commitment (PREMIS Maintenance Activity)

7. CONCLUSION

Digital preservation is increasingly becoming important in libraries, archives and other institutes. The investment on more and more resources in building collections of digital materials resulted in the corresponding need to take steps to ensure the long-term persistence, long term access of these objects. The development of well understood digital preservation strategies, shaping standards and guidelines for its use through collaborative efforts will enhance the prospects of building a network of trusted, interoperable digital repositories. The PREMIS activity is the first work on the formation of framework for digital preservation.

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Rise Up and Build Digital Curation for Indian Research Organisations: A Boon for Digital Academic Success

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Abstract: In the 21st century, the availability of modern technology has made it possible to create, upload and share digital content rapidly and systematically. The libraries functioning in such environments are required to be vibrant and ever-evolving knowledge banks, holding together the old traditional printed library materials as well as the digital materials. This paper emphasises the role played by the existing knowledge bank (i.e. digital library and institutional repository) in the creation of new research.

The World Wide Web has provided unlimited ability to create, interact, share and recreate digital information. There is a massive explosion in the amount of information that is available in the digital world. The information is generated at a rate which is historically unprecedented and continues to grow with time, almost hand in hand with the corresponding development in storage and computational technology. There is too much information available online impossible even for machines to process effectively. This information overload creates its own set of challenges with respect to durability, accessibility, usefulness and context. Digital information, if left to itself, degrades with time. It doesn't matter whether the information is stored keeping all bits of information intact, the context whether technological, social or any other will change with time making the information useless and no longer usable.

Keyword: Digitisation, Digital Curation, Digital Preservation, Data Curation, Information Management, FOSS, Open Archive Initiative

1. INTRODUCTION

Digital curation has evolved out of the field of preservation, a domain of archives and museums handling special collections. The need to preserve collections of importance whether historic, cultural or any other was the driving force behind such endeavours. The onset of computer technology and the subsequent flood of born-digital materials, documents created newer opportunities as well as challenges for libraries, museums and archives to face. The initial enthusiasm and efforts to convert or create documents in digital media were not always successful, and some were a complete disaster for e.g. The US Census Data of 1960 was recorded in UNIVAC format but computers that could read this format quickly became obsolete and the data was largely irretrievably lost (Warner & Buschman, 2004). Gradually, a need was felt, to formulate long-term preservation strategies for digital content and that is where Digital Curation comes into the picture. Digital Curation is a conscious activity that ensures digital content retains their usability irrespective of changes that are temporal, social, technological, financial or any other. It is a set of steps that ensure a body of digital information is maintained in such a way that it remains reusable and does not become inaccessible over the period of time. The term Digital Curation has often been used interchangeably with digital preservation but the later is actually one of the components of digital curation. Digital Curation entails the entire life cycle of the information, from its genesis to current use while keeping in mind its archiving and accessibility for future reuse. The term 'curation' may conjure up an image of an expert or expert group carefully making a selection of artworks to preserve it for posterity. This may be so because the term actually evolved from the Museum domain where curation has been essential activity since the very beginning. The methods and concepts that govern the selection process could be subjective to the curator's (organisations or authorised personal) sensibilities and interests, sanctified by the organisation's mission and vision. But the most relevant term would be the context which makes the whole process meaningful in the end.

2. NEED AND IMPORTANCE OF DIGITAL CURATION

Digital Curation is designed to address process which goes beyond just simply storing and preserving information in the digital age. It is a series of comprehensive steps that has to be incorporated into the organisation's annual plan and must be codified into a digital curation model employed across the different sections of the organisations. Questions about what to preserve, by whom and in which formats, budgetary allocations, differentiation of departmental work and, guidelines regarding best practices that can shape, define and affect the information preservation are essential. Each organisation will most certainly have its own laid out written or tacit rules towards creation, storage, retrieval and preservation of the data. There may be different criteria behind what each organisation may value or consider as worth saving and may be coloured by various factors like the nature of the organisations, collection and the format in which it is stored, generated and retrieved, who are its users and stakeholders and the period of relevancy or in other words timelessness of the information. Digital curation could be the answer to the following questions Indian Research Organisation.

- Handling of physical content/objects
- Access and preservation
- Long-term availability and use

- Remote access to the information
- Data migration, interoperability and crosswalk.

Digital assets can be extremely fragile and ephemeral, and that needs preservation. Thus, we should move ahead towards digital curation of Indian literary heritage available in the libraries, museums and archives of these organisations.

3. CHALLENGES OF DIGITAL CURATIONS

- **Digital Preservation and Policy Framework:** Preservation policies are guidelines on how we could manage digital assets in a computerised system so that the risk of content loss could be averted. The framework defines and specifies, data storage requirements, preservation actions, roles and responsibilities. Physical control of the digital content, future retrieval, preservation of significant characteristics of the digital assets eve after physical medium changes (Dappert & Enders, 2010). Neil Beagrie (2006) also has the opinion that digital preservation solutions are partly technical, partly organisational and procedural. Therefore, digital curation depends on the interaction between the digital preservation environment and objectives of the organisation and procedural issues (Beagrie, 2006). At the institutional level following examples could be cited: "The digital preservation process at The National Archives of U.K. (TNA) is based on two sets of activities: a) passive preservation for secure storage and 2) active preservation for continued accessibility of the records stored over the period of time and transforming technologies" (Brown, 2007, p. 5). The concerns for digital preservation thus led to efforts at the policy level to draft guidelines that could identify the problem and suggest policy level solutions on such report by The Blue Ribbon Task Force on Sustainable Digital Preservation and Access (TBRTFSDPA) (2008) notes following five major problems of building a sustainable digital preservation program:
  a) Inadequate funding models to cater the longer access and preservation requirements;
  b) Lack of clarity and coalition between stakeholders, their duties, and obligation with respect to digital access and preservation leads to the confusion;
  c) inadequate incentives for the community by the institutional and enterprise to support the collaboration required for reinforcement of sustainable economic models;
  d) self-satisfaction that existing procedures are adequately sound; and
  e) Phobia from preservation that access and preservation of digital objects are more technical and cumbersome job.

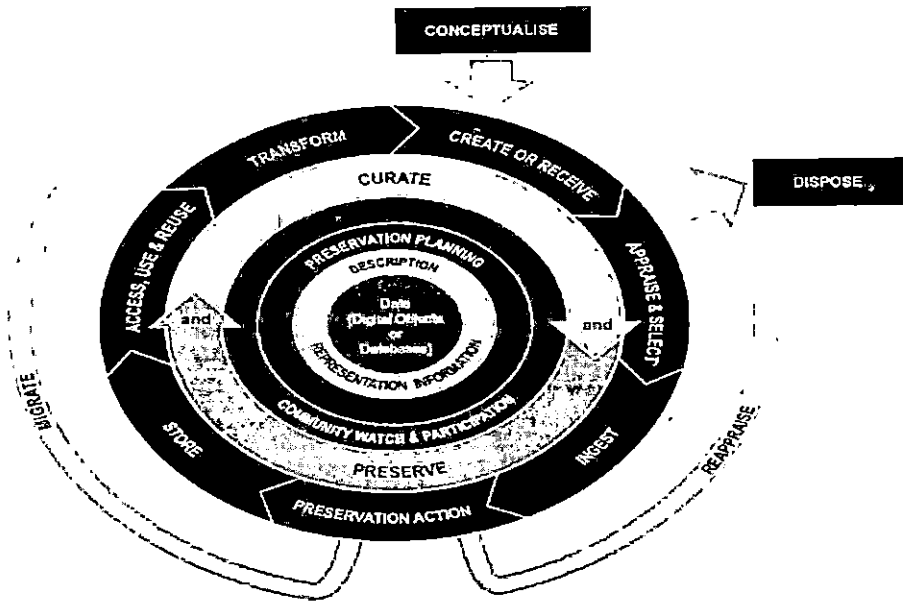
  Emphasising on the issue of urgency, the report further stresses on the fact that the digital assets could be highly delicate and transitory, and that needs preservation decisions to be taken as early at the time of the creation of the digital object (TBRTFSDPA, 2008).
- **Metadata Standards for Digital Archiving:** The preservation goals of institutional repositories depend on the availability of preservation of metadata – in other words, it is the set of information describing the digital content embedded in the computerised system to ensure the content has a longer lifespan and remain available for future reuse. Based on the functional aspects the specific metadata requirements needed for longer preservation could be categorised following categories:

- **Descriptive metadata:** describes the noetic details via attribute such as author, title, to perform the precise discovery and prompt delivery of the content. Can provide historic context (i.e. which printed documents was the archetype root for a digital derivative).
- **Structural metadata:** the seizure of physical structural relationships (i.e. which image is embedded within which website), as well as logical structural relationships (i.e. which page follows within in a digitised book).
- **Technical metadata:** It required physical files which include technical details that can be applied to any kind of file, such as information regarding the software and hardware on which the digital content can be rendered or executed, checksums and digital signatures to sure the fixity and legitimacy. It also includes technical information which is content specific i.e. Dimensions of photos or running time of an audible file.
- **Administrative metadata:** Includes inception details such as who takes care of digital content or what preservation techniques have been executed on it, information of rights and permission, for example, access to the digital object, including which preservation actions are permissible (Dappert, & Enders, 2010).
- **Standardisation of Terms of Digital Preservation:** A major concern in Digital Preservation is the lack of standardisation of terms and which points towards the lack of clarity among various institutions that are engaged in pioneering work in digital curation towards what each term should actually mean or convey. Standardisation can address a lot of confusion generated while communicating between different organisations. Terms like non-proprietary, platform-independent etc. There is a need to bring clarity to the usage of terms like 'widely-used', 'widely-accepted', 'popular', 'stable' when it is related to the use of formats for long-term preservation. A common format like one rule that fits all may not be possible here but at least a common understanding of what is the best practices being followed in similar situations could go a long way in the drafting of policy frameworks in other institutions engaged in the similar work world across. However, having said that there are practical difficulties to do this as like what Library of Congress, acknowledges that it is difficult to quantify what it means to when one says 'level of use'. In this regard they consider the evidence of wide "adoption of a digital format being the associated bundling of tools with personal computers, native support in Web browsers or market-leading content creation tools, including those intended for professional use, and the existence of many competing products for creation, manipulation, or rendering of digital objects in the format". They also add that a format that finds wider acceptance among archival institutions can also be considered as evidence in its favour. Following this advice, the Department of Architecture at the Art Institute of Chicago, recommends TIFF and PDF as mostly used for archival (McLellan, 2007).

4. DIGITAL CURATION LIFECYCLE MODEL

The Draft Digital Curation Centre (DCC) Lifecycle Model was first published in the *International Journal of* Digital Curation in December 2007. The DCC Curation Lifecycle Model (Fig. 1) provides a high-level graphical visualisation of the various steps of information life as required for successful curation. The model presents a generalised depiction and is not specific to diverse information requirements or case. The remarkable feature of the model is its employability as a planning tool (See Table. 1) at organisational level where it is flexible enough to be adapted to planning, designing and allocating curation and preservation activities at different steps of granularity.

Fig. 1: DCC Digital Curation Lifecycle Model



Source :(Higgins, 2008)

What the DCC Digital Curation Lifecycle model entails can be best described in the following manner: DCC curation lifecycle model has offered a high-level graphical detailed overview of the various stages involved in a lifecycle of digital object for successful curation. The model seems to be more indicative rather than exhaustive. The model is a tool for organisational planning of different domains of curation. It defines roles and responsibilities, building the framework, standards and associated technologies. The model also identifies the sequences of course of action applicable during the lifecycle. The model is complementary in nature rather than repetitive and can be used in alignment with appropriate standards, models and frameworks. Various aspects can be enhanced by using standards like OAIS (International Organization for Standardization [ISO], 2003) and ISO 15489 (ISO, 2001) (Higgins, 2008).

The model (See Fig. 1) acts as an effective guideline that assists in planning activities in an organisations or group of organisations collaborating together that ensures a set of sequence of steps that best preserves the digital information. It

assists in defining roles and responsibilities, and sets a framework of standards and technologies that need to be adopted, suggests steps that may be required to be taken or discarded as the case may be in order to achieve the results. To begin with, the model deals with the definition of digital data that is inclusive of digital objects as well as databases. Data that is information in the binary digital form and could range from texts, images, audio, and their related metadata, to structured collection of records or data stored in a computer system or server. The model delineates a series of actions that are as follows:

Table 1: DCC Digital Curation Lifecycle Actions

Data	**Digital Objects:** Independent data objects contain related metadata and identifier information, could be multimedia
	Databases: A structured collection digital records/objects stored and accessible through computer
Description and Representation Information	Assigning of administrative, descriptive, technical, structural and preservation metadata, using appropriate standards for description and control. Collecting and assigning of representation of information to understand the digital content and the related metadata
Preservation Planning	Planning for the conservation of digital material through the curation lifecycle model. This will include managerial and administrative plans for curation lifecycle steps
Community Watch and Participation	Keeping an eye on the relevant group activities, and participation in the evolution of standards, tools and appropriate Softwares
Curate	Awareness and execution of managerial and administrative course of actions planned for the promotion of curation and preservation.
Preserve	Awareness and execution of managerial and administrative course of actions planned for the promotion of curation and preservation.

I: Sequential Actions	Description of Actions
Conceptualise	Thinking and planning the creation of data (including data capturing methods and storage options)
Create and Receive	Data Creation (creating administrative, descriptive, structural and technical metadata.) The addition of preservation metadata and data collection from data creators, other archives, repositories or data centres as per the policy.
Appraise and Select	Data evaluation and selection for longer curation and preservation as per the guidelines.

Ingest	Data transfer to the archive, repository, data centre or other custodians as per the guidelines.
Preservation Action	Taking action to make sure the longer conservation and holding of authorised data. The authentic, reliable and usable data must be preserved while maintaining its integrity. In the process following actions are required cleaning of data, validating data, designating preservation metadata, attaching delegate information and making sure satisfactory structures of data and format of files.
Store	Data storing as per the standards.
Access, Use and Reuse	Data accessibility, usability must be ensured for designated users and re-users. Could be in the form of open access.
Transform	Creation of new data from the original wok, i.e. data migration into a different format, creating a subset, by selection or query, to create newly derived results, perhaps for publication.
II: Occasional Actions	Description of Actions
Dispose	Disposing of unused data not selected for curation as per the policy. May be transferred to another custodian. Sometimes data is destroyed.
Reappraise	Returning of failed data for validation procedures for fostering reassessment and reselect.
Migrate	Migration of data into a new format. This may be done in accordance with the repost settings or for ensuring the data insusceptibility from the obsolescence of hardware and software.
Source :(Higgins, 2008)	

The lifecycle model is an attempt at identifying all the stages of life for a digital material while it stays in the collection of a repository, archive, and library. This identification is very important in order to set standards of actions that are required at each stage in order to ensure the digital materials last longer and be available for reuse in future.

5. DIGITAL CURATION MODEL – BEST PRACTICES

i) **FOSS for Digital Curation and Academic Success:** The Lifecycle approach for digital curation is given a new lease of life by the accepting source software. Many organisations working in the field of digital curation or simply facing the challenging tasks of digitizing the collection material have begun to realize the importance of employing open-source software solutions as this has benefits like the data longevity; easy to re-create or emulate; stand by with

the use of open standards; legally free to use; its associated costs; its omnipresence; metadata support; and constancy. The open source movement has been through a sea change from being the pursued by hobbyists it has developed into a vibrant movement in itself with a dedicated set community of developers and innovators. The most advantageous reason for using open source software is the flexibility and customization that the availability of source code provides. The software under open-source empowers and encourages, even 'rewards modification, re-use, redistribution and understanding.' Andrew McHugh (2005) discusses that importance of open-source software along with other reasons lie in their transparent nature. There is nothing hidden or financial agenda behind the software packages and therefore this ascribes an element of honesty to them (McHugh, 2005).

ii) **Xena:** Xena (XML Electronic Normalising of Archives) developed by the National Archives of Australia as a project keeping in mind the challenges posed by digital obsolescence and thus was designed to resolve this issue through transforming electronic records in proprietary formats to a standard XML format of future readable technologies. Xena supports the variety of file formats could be exchanged to the standard XML without losing the information. This includes Microsoft Word, Excel and PowerPoint, OpenOffice.org suite of formats, RTF, Relational database files, JPG, GIF, TIFF, PNG and BMP image files, HTML and plain text file formats. Some of the other open source Software is the GNU Eprints, developed by the University of Southampton which offers the creation of online archives, development of Institutional Repository. It is very helpful for the establishment of an academic repository and helps in the diffusion and dissemination of the research output via sharing the associated metadata using Open Archive Initiative (OAI) standards. Some of the other open source options are MyCoRe, developed in Germany, Dutch ARNO and CERN Document Server Software also (McHugh, 2005).

iii) **JHOVE:** JHOVE is a collaborative work between JSTOR and Harvard University. This provides great flexibility to perform format-specific identification, validation for security purposes. The JHOVE offers tools to automatically identify an unknown format and then decisions can be taken whether to accept or reject it. It provides support for the standard format modules like AIFF, ASCII, GIF, HTML, JPEG, PDF, TIFF and XML (McHugh, 2005).

iv) **The Open Archival Information System (OAIS):** The OAIS reference model defines a framework with a common vocabulary and provides a functional and information model for the preservation community; it does not define which specific metadata should be collected or how it should be implemented in order to support preservation goals (Dappert & Enders, 2010). The OAIS model has defined the field of digital preservation systems. It discovers the participants, explains the roles and responsibilities of their and classification of information to be exchanged. One of the systems based on OAIS is **LOCKSS system (Lots of Copies Keep Stuff Safe),** developed by Stanford University Libraries. LOCKSS work with publishers and makes associated libraries to acquire copies of the e-journals which are subscribed by them, as well as documents promulgated in the open-access mode. Every participating library of the LOCKSS network hosts machine running LOCKSS software, this track the websites of e-journal publishers to gather content. The LOCKSS machine identifies and repairs any corrupted content using a voting system in a peer-to-peer audit by talking to the partner libraries

(Paradigm project, 2008).

6. DIGITAL CURATION AND PRESERVATION IN GLOBAL CONTEXT

The term digital curation originated in the U.K. and was first used in scholarly parlance in a digital preservation workshop. It, however, owes its existence to much earlier work being done in the field of natural history museum domain. The concept of curation came from the field of Natural History Museums domain that has been engaging themselves with the curation of scientific data consisting in the form of a physical dummy. The term curation, therefore when thus begun to be applied to digital collection acquired the same connotations of meticulous management and preservation of digital research data. In the pursuit of achieving successful preservation of digital material the UNESCO/PERSIST (Platform to Enhance the Sustainability of the Information Society Transglobally) Project has also formulated a bunch of useful instructions for the recognition of digital content for longer preservation (Choy et al., 2016). These set of instructions have been formulated by the Content Task Force for the discourse UNESCO and other communities. The aim of these guidelines is to serve as a reference to the institutions engaged in preservation or in the process to begun or to draft their own set of policies which at the point are heritage management organisations apart from the libraries, archives, and museums. Existing policies may also be explored and evaluate against these instructions and revised accordingly (Choy et al., 2016).

7. DIGITAL CURATION AND PRESERVATION IN INDIAN CONTEXT

Indian Higher Education System is one of the widest education systems in today's world. The Indian education system consists of many specialised institutions of learning and research such as central Universities, State Public Universities, Deemed Universities, State Private Universities, Institutions of National Importance, Institutions under the State Legislature Act, Central Open University, State Open Universities and apart from these the Indian education system has created world renowned organisation like Indian Institute of Managements, Indian Institute of Technology's, Indian Institute of Science and Indian Institutes of Science Education and Research (IISER). As per the All India Survey on Higher Education (AISHE) which covers the entire Higher Education Institutions in the country. As per the AISHE 2016 data, the total number of enrolment in the higher education system was estimated to be the 34.2 million. There are about 760 Universities, 38498 colleges and 12276 standalone institutions listed on the web portal of All India Survey on Higher Education (AISHE). Among these 261 Universities are privately managed. In addition, there is One Central Open University, thirteen State Open Universities and One State Private Open University in the country. There are 112 Universities which offer education through dual mode. All of these institutions are catering the needs of higher education system. There are many other organisation are engaged in research some of the notable are ICMR (www.icmr.nic.in), ICAR (www.icar.org.in), CSIR (www.csir.res.in), ICSSR (www.icssr.org), ICPR (www.icpr.in), PHISPC (www.csc-india.in/phispc.html), ICHR (http://ichr.ac.in), NCRI (www.ncri.in), AICTE (www.aicte-india.org), COA (https://www.coa.gov.in/) and many others. Many of these are engaged in the teaching and research activities. These organisations offer undergraduate, postgraduate, M.Phil. and Ph.D. programmes. We can just imagine the amount of research is being produced by these institutions every year. It is notable that 1.7% Colleges run the Ph.D. programme. 1,17,301 students are enrolled in

research programmes leading to the Ph.D. degree and most of them are enrolled in Sciences followed by Social Science. During the year, 21,830 students were awarded Ph.D. This landscape of research generation is changing the day by day and there is an acute need to cultivate and curate this research data for future generations. All of these institutions are having libraries, digital repositories, and digital libraries and have started the digital preservation and data curation. These institutions are the front runner in the digital preservation and data curation movement of the country (notable are IITs, IIMs, Institution of National Importance and Central Universities). The most notable efforts are the formation of Information and Library Network (INFLIBNET) Centre, set up by the University Grants Commission. NFLIBNET has started to cultivate metadata names Shodhganga (http://shodhganga.inflibnet.ac.in/) of theses and dissertations awarded by the Indian universities by making it mandatory. As of now, more than One Lakhs Fifteen Thousand theses have been made available to the users. It is engaged in preservation and conservation of data for access and reuse by the academic community in the open access mode (INFLIBNET, 2016). The INFLIBNET is also offering offers e-journals, e-books and e-Databases through e-Shodhsindhu (http://www.inflibnet.ac.in/ess/) programme (INFLIBNET, 2016). The National Digital Library of India (NDL) project another sponsored project of Ministry of Human Resource Development, Government of India, have developed a virtual repository of learning resources which has a single-window discovery facility. The Indian Institute of Technology, Kharagpur, is coordinating the project. The research community is data driven whether it is educational, scientific and technological, Social science, Humanities, etc., it is information generation which is core activity all of it. The rising significance of digital information has emphasised the need to carefully handle and ensure its survival for future access and reuse. The initial efforts are towards the digitally preservation the material to survives technological obsolescence (AISHE, 2016)

8. CONCLUSION

Today our Indian research organisations community is data driven, whichever walks of life whether it is education, science and technology, the conduct of business, communication, etc., it is digital information which lies at the heart of it all. The rising significance of digital material has also brought the recognition which is required to be cautiously handled in order to make sure its longevity and continued access for future reuse. The initial efforts towards digital preservation were more focused to preserve the material so that it can survive technological obsolescence and organisational mismanagement. Sarah Higgins (Higgins, 2011) writes about the early focus on preservation that was more inclined towards digital objects and less access. The preservation implied inaccessible "dark archive" and restricted access. However, there is a considerable shift over the years towards ensuring how the digital material is managed throughout its lifecycle. Digital material and its associated metadata are given adequate importance to both improve accessibility and discoverability, to ensure authenticity and provide in place necessary information security measures to ensure data integrity. However, digital materials are by their very nature meant to be used, reused for new purposes and for creating new materials (Higgins, 2011, p. 79). Having said that Ambacher B.I. et. al (2013) discusses the technical, societal, and conceptual challenges faced by digital curation in public, private and not-for-profit organisations at both the level national as well as international. It is to be noted that the digital curation is a relatively new field and the implications of its requirement are still being realised. However, the speedy production of information in electronic and the need to information management has recognised by the various organisations (Ambacher, et al., 2013). While digital curation of data we must ensure that the data under preservation and conservation did not

become obsolete and redundant. Thus, there should be a scope of technological convergence of data.

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Application of Cloud Computing Services in Libraries: An overview

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Abstract: The Cloud computing is a type of internet-based computing that provides shared computer processing resources and data to computers and other devices on demand. It is a model for enabling ubiquitous, on-demand access to a shared pool of configurable computing resources.Libraries being the information centers have embraced the cloud computing system to provide services to the users. Cloud computing can transform the way systems are built and services delivered, providing libraries with an opportunity to extend their impact. It is used to build a digital library and to automate housekeeping operations using third party services, both software and hardware. The present paper gives an overview of cloud computing, its characteristics, types, deployment models, agencies and its working. At the end it mentions the application ofcloud computing services in libraries.

Keywords: Cloud computing, Software-as-a-service, Platform-as-a-service, Infrastructure-as-a-service, Cloud library services

1. Introduction

We are living in the information explosion era. Information is an important resource for our day-to-day activities. Handling this information to serve our purpose plays an important aspect for the success of our life. The innovations have made our life easier. We are blessed with the application of new technologies to best handle the information. The innovations in the field of handling the information have made us to live in a global village where we can access information at our finger tips within the fraction of seconds from any part of the world. This is possible due to the revolution in the field of Information and Communication Technology (ICT). The internet is part of such revolution. The Cloud computing is a type of internet-based computing that provides shared computer processing resources and data to computers and other devices on demand. It is a model for enabling ubiquitous, on-demand access to a shared pool of configurable computing resources (e.g., computer networks, servers, storage, applications and services),(Hassan, 2011),Jump(2011) which can be rapidly provisioned and released with minimal management effort. Cloud computing allows users to use applications without installation in their local machine to access their personal and official files on any computer with internet connectivity. This technology though not a new one but is associated with the inception of web and allows users to access much more efficient computing

by centralized storage,memory and processing. Cloud computing has become a major topic of discussion and debate for any business or organization which relies on technology. Anyone connected to the internet is probably using some type of cloud computing on a regular basis. Whether they are using Google's Gmail, organizing photos on Flickr or searching the Web with Bing they are engaged in cloud computing. As Geoffrey Moore points out, the interesting thing about cloud computing is it did not start as a technology for the business enterprise, but was driven by the public with services like Facebook and Flickr. In reality, a majority of people are using cloud computing services without recognizing it. These services include Google Docs, e-mail services, social networking sites like Facebook, Photo sharing networks like Flickr. Currently data availability, scalability, elastic service, and pay-per-use are attractive characteristics found in the cloud service model. There are several examples of public cloud storage, such as Amazon S3, Rack Space and Google Storage which offer high availability, fault tolerance, and services and administration at low cost.

The origin of the term cloud computing is ambiguous, but it appears to originate from the practice of using drawings of stylized clouds to denote networks in diagrams of computing and communications systems. The word 'cloud'is used as a metaphor for the internet, based on the standardized use of a cloud-like shape to denote a network on telephony schematics and later to depict the internet in computer network diagrams as an abstraction of the underlying infrastructure it represents. The cloud symbol was used to represent the internet as early as 1994. The name comes from the use of a cloud-shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts remote services with a user's data, software and computation. It is a web based computing where shared resources, applications and information are provided to the set of computers and other devices on demand using web technology. Therefore, the process of cloud computing is being done through set of web enabled applications loaded on the server with proper access rights.Libraries being the information centers have embraced the cloud computing system to provide better services to the users. Cloud computing can transform the way systems are built and services delivered, providing libraries with an opportunity to extend their impact. It is used to build a digital library and to automate housekeeping operations using third party services, both software and hardware. These services are free to all users to a certain limit, beyond any extra storage capacity and advanced services available at a cost. Cloud can provide services over network, i.e., on public networks or on private networks, i.e., WAN, LAN or VPN. Applications such as e-mail, web conferencing, Customer Relationship Management (CRM), all run in cloud. Cloud Computing refers to manipulating, configuring, and accessing the applications online. It offers online data storage, infrastructure and application.

The various authorities have defined the concept cloud computing. According to National Institute of Standards and Technology(NIST) cloud computing is a model for enabling convenient, on-demand network access to shared pool of configurable computing resources (e.g. network, servers, storage, application and services) that can be provisioned rapidly and released with minimal management effort or service provider intervention(Jump, 2011). The cloud infrastructure promotes availability and is composed of five essential characteristics, three service model and four deployment models.Gosavi N Patil..etal (2012) defines cloud computing as an emerging computer paradigm where data and services reside in massively scalable data centers in the cloud and can be accessed from any connected devices over the internet. Cloud computing is a way of providing various services on virtual machines allocated on top of a large physical machine pool which resides in the cloud.

2. Characteristics of Cloud Computing

The cloud computing is a global concept which carries its own special features. The important among them are;

- On-demand self-service: A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service provider.
- Broad network access: Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations).
- Resource pooling: The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand.
- Rapid elasticity: Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand.
- Measured service: Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service

The common features of cloud computing noticed fromabove characteristics are;

- ✓ Pay Per Use (No Ongoing Commitment, Utility Prices)
- ✓ Elastic Capacity and the Illusion of Infinite Resources
- ✓ Self Service Interface
- ✓ Resources that are Abstracted or Virtualized.

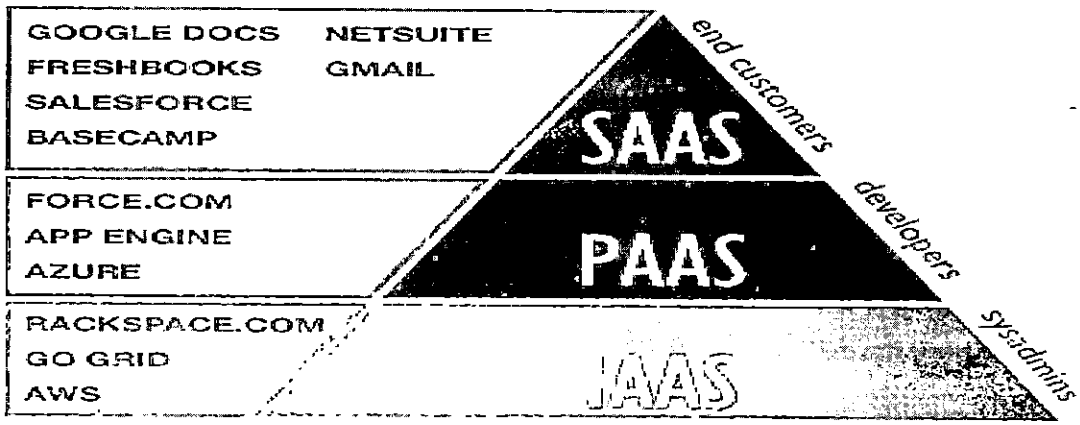
3. Service Models of Cloud Computing

The following are the models of cloud computing(NIST, 2013; Harris Torry, 2013)

- Infrastructure as a Service(IaaS)

IaaS provides basic storage and computing capabilities as standardized services over the network. Servers, storage systems, networking equipment, data centre space etc. are pooled and made available to handle workloads. The customer would typically deploy his own software on the infrastructure. Some common examples are Amazon, GoGrid, 3 Tera, etc.

- Software as a Service (SaaS)
- In this model, a complete application is offered to the customer, as a service on demand. A single instance of the service runs on the cloud & multiple end users are serviced. On the customers" side, there is no need for upfront investment in servers or software licenses, while for the provider, the costs are lowered, since only a single application needs to be hosted & maintained. Today SaaS is offered by companies such as Google, Salesforce, Microsoft, Zoho, etc.
- Plateform as a Service (PaaS)
- Here, a layer of software, or development environment is encapsulated & offered as a service, upon which other higher levels of service can be built. The customer has the freedom to build his own applications, which run on the provider"s infrastructure. To meet manageability and scalability requirements of the applications, PaaS providers offer a predefined combination of OS and application servers, such as LAMP platform (Linux, Apache, MySql and PHP), restricted J2EE, Ruby etc. Google"s App Engine, Force. com, etc are some of the popular PaaS examples.
- The above models of cloud computing can be well presented with the chart given below



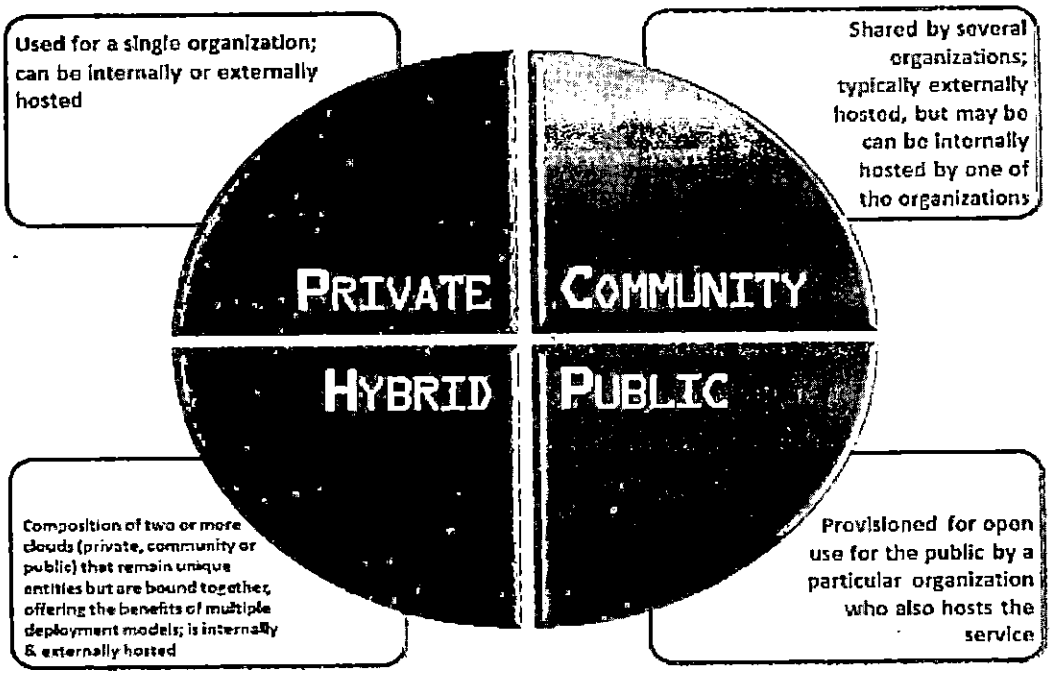
Source:http://www.globaldots.com/cloud-computing-types-of-cloud/.

4. Cloud Computing Deployment Models

Cloud computing is defined with several deployment models, each of which provides distinct trade-offs foragencies which are migrating applications to a cloud environment. NIST defines the cloud deployment modelsas follows:

- **PublicCloud:**The cloud infrastructure is made available to the general public. It may be managed, owned and operated by a business, academic, or government organizations, or a combination of them. It exists on the premises of the cloud provider.
- **PrivateCloud:**The cloud infrastructure is operated by a single organization. It may be owned, managed and operated by the organization or a third party and may exist on premise or off-premise. (i.e. enterprise owned or leased).
- **Hybrid Cloud:** This is combination of public and private computers. It has qualities of both public clouding private clouding. In this type of cloud sensitive data is stored in private cloud and other data is in public cloud.
- **Community Cloud:** The cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds).

The above deploymentmodelsare presented below .



Source:http://bigdatariding.blogspot.in/2013/10/cloud-computing-types-of-cloud.html

1. Agencies of Cloud Computing

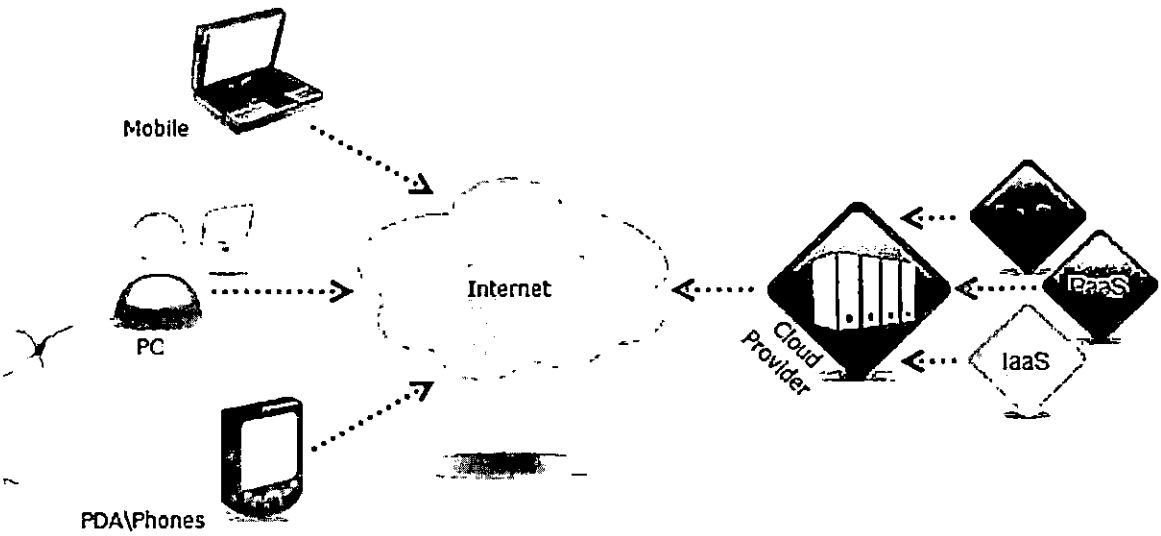
The following are major providers of cloud computing services to the public

Sl No.	Platforms' Description	Features
1	Salesforce.com	This provides a simple user interface and lets users log in, build an app and push it in the cloud
2	Appistry	The Appistry'sCloudQ platform is efficient in delivering a runtime application platform. This platform is very useful to create scalable and service oriented applications.
3	AppScale	The AppScale is an open source platform for Google App Engine applications

4	AT&T	The AT&T allows access to virtual servers and manages the virtualization infrastructure. This virtualization infrastructure includes network, server and storage
5	Engine Yard	The Engine Yard is a Rails Application cloud computing platform
6	Enomaly	Enomaly provides the Infrastructure-as-a-Service platform
7	FlexiScale	The FlexiScale offers a cloud computing platform that allows flexible, scalable and automated cloud infrastructure
8	GCloud3	The GCloud3 offers private cloud solution in its gPlatform
9	Gizmox	The Gizmox Visual WebGUI platform is best suited for developing new web apps and modernize the legacy apps based on ASP.net, DHTML, etc
10	GoGrid	The GoGrid platform allows the users to deploy web and database cloud services
11	Google	The Google's App Engine lets the users build, run and maintain their applications on Google's infrastructure
12	LongJump	TheLongJump offers a Business Application Platform, a platform-as-a-Service (PaaS)
13	Microsoft	The Microsoft's Windows Azure is a cloud computing platform offering an environment to create cloud apps and services
14	OrangeScape	OrangeScape offers a Platform-as-a-Service (Paas) for non -programmers. Building an app is as easy as spreadsheet
15	RackSpace	The RackSpace provide servers-on-demand via a cloud-driven platform of virtualized servers
16	Amazon EC2	The Amazon EC2 (Elastic Compute Cloud) lets the users configure and control computing resources while running them on Amazon's environment

2. Working of Cloud Computing System

- The cloud computing works on the two basic interfaces; back end and front end basis. The following chart shows the working of the cloud computing system.



Source:http://wso2.com/library/articles/2010/09/understanding-cloud-computing/

The front end isthe interface or the main screen that is visible to the customers and the users through which theycan interact with the system. This interface can be browsed with the help of web browsers and allthe applications can be used with this interface. Usually this interface is based on Graphics UserInterface (GUI).The back end involves all the components and the complete architecture andprogramming technique of cloud computing, that totally remains hidden from the users. Onlysystem knows what is going on at the back of very user request. The back end device includesCloud server, Assistant computers, Data storage media and many connectors.

5. Cloud Computing in Libraries

We are living in the information age. Being information centers, Libraries face mounting challenges in managing the assets of their collection andmaintaining or improving service levels to patrons. For the past two decades, libraries havereached out their services to its patrons, initially offering physical forms to adding multi-mediaitems at an advanced level through electronic media. In recent years, impact of cloud computingtechnology has been tremendous on the library and information centers and the developments arefor all to witness. Libraries have been one of the

first institutions to be affected by theInformation and Communication Technology (ICT) developments and these developments havebeen exploited effectively to render various information services. Right from the days ofdesigning databases to entering and retrieving records from the database, it has been excitingtimes for all library professionals. Just when it was time to rejoice the fruits of creating and usinglocal databases on desktops, the communication revolution made its arrival.The cloud computing is lately emerged in the field. It is a completely new Information Technology(IT) and it is known as the third revolution after PC and internet in IT. It has become a new buzzword in the field of libraries, which is blessing in disguise to run different ICT services without much of a problem as third-party services will manage servers and undertake upgrades and take backup of data. The basic principle of cloudcomputing entails the reduction of in-house data centers and the delegation of a portion or all ofthe IT infrastructure capability to a third party. Universities and Collegesare the core of innovation through their advanced research and development. Subsequently,higher institutions may benefit greatly by harnessing the power of cloud computing, includingcost cutting as well as all the above types of cloud services. The libraries which do not havesufficient budget to acquire high-end technology with proper hardware and software can choosecloud. To cope up with the new technological innovation in the field one needs to know andexplore cloud computing. Since cloud computing is a new and core area the professionals should be aware of it and also the application of cloud computing in library science.Moving to cloud-based services means, the library housekeeping operations, digital libraries etc.are hosted on cloud-based network. In the modern era, many libraries are using Google webtechnology knowingly or unknowingly to provide services. Nowadays many libraries areprocessing documents, using Google web technology (Google Docs) on day-to-day basis. Use ofGoogle apps and other similar tools in the libraries shows a radical shift from traditional toadvanced technologies. Now-a-days, libraries are providing good number of services to their usersto access various resources and computer applications from a single platform. This is anadvantage of cloud computing.Many libraries are thinking to adopt cloud computing but they are facingproblems in relation to standardized software, administrative procedures, budget constraints,connectivity problem etc. These days, some foreign companies are providing cloud basedservices.Therefore the main benefit in moving to a cloud computing environment for a library isthe ability to try out new software without having to buy the hardware as well as being able toscale the computing power to meet the demand of users. . In future, the advantages of this technology may increase its usability, which will relieve libraries and its professionals from the hardships in maintaining the servers, software and manpower.

Therefore the cloud computing is useful both libraries as well as user community. It is a current and rapidly emerging technology to fully participate in the web's information land-scape.Increases visibility and accessibility of collections, reduces duplication of effort from

networked technical services and collection management.It streamlines workflows, optimized to fully benefit from network participation, helps in cooperative intelligence and improved service levels enabled by the large-scale aggregation of usage data and also make libraries greener by sharing computing power thus reducing carbon footprints

6. Advantages of Cloud Computing for libraries

The cloud computing is advantageous to the libraries in the following ways;

- Cost reduction- Ability to increase or decrease the consumption of hardware or software resourcesimmediately and in some cases automatically.
- Scalability- "Pay as you go" allowing a more efficient control of expenditures.
- Lower investment, reduced risk- Immediate access to the improvements in the resource proposed(hardware and software) and debugging.
- Support included- Enjoyment of the most advanced security procedures, availability and performanceof providers with experience and knowledge in this type of service.
- Greater security and accessibility- Access to resources from any geographical point and the ability totest and evaluate resources at no cost.
- Portability- since the service is available over the web, the service can be availed through browser fromany part of the world.
- Adjustable storage- In the traditional system, if the server is less than what we have. The server shouldbe replaced with the new one. In this computing, the storage capacity can be adjusted according to theneeds of the library, since the storage is controlled by the service provider.
- Cloud OPAC- Most of the libraries in the world are having the catalogue over the web. Thesecatalogues are available with their libraries local server made it available over the web. If the catalogueof the libraries made it available through cloud, it will be more benefit to the users to find out theavailability of materials.
- Cloud can offer the possibility of storing the files and accessing, storing and retrieving them from any web-enabled interface. The web service interfaces are usually simple. At any time and place you have high availability, speed, scalability and security for the environment. In this scenario, organizations are only paying for the amount of storage they are actually consuming, and do so without the worries of overseeing the daily maintenance of the storage infrastructure. There is also the possibility to store the data either on or off premises depending on the regulatory compliance require-

ments. Data is stored in virtualized pools of storage hosted by a third party based on the customer specification requirements.

- This is yet another benefit derived from using cloud based on the cost effectiveness of a Disaster Recovery (DR) solution that provides for a faster recovery from a mesh of different physical locations at a much lower cost that the traditional DR site with fixed assets, rigid procedures and a much higher cost.
- Backing up data has always been a complex and time-consuming operation. Cloud-based backup, while not being the panacea, is certainly a far cry from what it used to be. One can now automatically dispatch data to any location across the wire with the assurance that neither security, availability nor capacity are issues.

7. Disadvantages of Cloud Computing for Libraries

Various studies have identified the demeritsof cloud computing. Shekar&Kogamurmatt (2013), noted the following issues which are affecting the libraries;

- Security and privacy: Libraries have a role tokeep sensitive data safe as circulation recordsneed to be secure. Readers should also notforget that security is a major concern. Forsensitive data, one must follow policies andperform encryption to secure it in the cloud.Encryption of sensitive data and appropriateclauses in contracts with cloud computingservice providers are good practices to keepdata safe.
- Policies and procedures depend on the nature ofdata to be stored, size of the data, period of datato be preserved, etc.
- Issues related to data security, reliability,speed, accuracy and inevitable legacy whenintroducing the cloud computing services areto be sorted out.

Various studies(The Digital Shift, 2012; Cervone, 2011; Grant, 2011) stress upon the weaknesses of cloud computing, and said that the library community is most concerned about security and privacy. Although most cloud computing providers go to great lengths to ensure security, it is important that libraries do their due diligence before moving data, patron data in particular, to the cloud. Data ownership is another important matter in the library cloud. Questions like what rights do the library and the vendor have to cloud-based data, can the vendor mine patron data, and if the library chooses to leave a cloud-based service, what data will be returned, need to be thoroughly evaluated and addressed in a service-level agreement before libraries migrate to the cloud. For libraries with budget

concerns, careful assessment of all the costs (e.g. network bandwidth, transition costs, and backup storage costs) involved is necessary as cloud solutions are not always cheaper when all factors are considered.

8. Conclusion

Cloud computing is a new and promising paradigm delivering IT services as computing utilities. As clouds are designed to provide services to external users, providers need to be compensated for sharing their resources and capabilities. Libraries have been using some cloud computing services for over a decade. Online databases are accessed as cloud applications. Large union catalogs can also be defined as cloud applications. However, there is no reason to extend cloud-based services only to libraries' end users.As Marshall Breeding points out, "we can't let the current focus on front-end interfacesmake us complacent about the software systems that we use to automate routine libraryfunctions."The vision is to use cloud computing to deliver library resources, services and expertise atthe point of need, within user workflows and in a manner that users want and understand. It should free libraries from managing technology so they can focus on collection building,improved services and innovation. The cloud computing model will encourage libraries andtheir users to participate in a network and community of libraries by enabling them toreuse information and socialize around information. It can also create a powerful, unifiedpresence for libraries on the web and give users a local, group and global reach.

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Applications of Internet of Things in Library Services

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Abstract: The reason for this paper is to consider the Internet of Things (IOT) and its potential effect on libraries. Internet of Things making it conceivable to interface questions and exchange information with or without human intercession. In imparting the issues while appreciating the extent of the IOT, libraries require not surrender to the occasionally close madness that encompasses the talk with respect to security and protection. In any case, Librarian should effectively participate in the discussion and its consequent activities to react to benefactor's who utilize library systems and gadgets with quiet, coherent and straightforward responses to those inquiries concerning what they are doing to guarantee that security and protection capacities are routinely tended to. An endeavor has been made to clarify what is ' Internet of Things', the innovation and its development, cases from administration ventures and ponder on it's conceivable effect on libraries and recognize potential library ranges where it can be actualized viably.

Keywords: Internet of Things; Libraries; Information and Communication Technology

1. Introduction

Today, Internet has involved a particular position in different circles of human life. Its development is initiated by cell phones, which have progressively gotten to be a piece of present day living as everybody wishes to be associated with the Internet constantly. This has turned out to be conceivable attributable to expanding accessibility of broadband Internet association at a lessened cost, accessibility of more gadgets with Wi-Fi capacities, innovation moderateness at lower cost and high entrance of advanced mobile phones. Thusly, it is chilling to some who have proposed that the IOT carries with it propels wherein we should likewise turn out to be more mindful and on-watch as to our protection and security as an aftereffect of the expanded quantities of gadgets we utilize each day in our homes and working environments that are regularly interconnected utilizing the web as its medium of correspondence.

The advancements of Information and Communication Technology have made it possible for us to get to plenty of services, for example, discovering data, shopping, booking tickets, exploring through maps and correspondence over email, online networking and portable applications. This all brought about Internet for correspondence and getting to specific services over devices. However, the following insurgency, where in Internet, similar to cell phones will involve pervasive position in our lives as it begins interfacing things in the physical world and this normal to have a major impact in the way we live.

It is called 'Internet of Things'(IoT), associating any question, which may incorporate everything from phones, coffee creators, auto/cars, clothes washers, ventilation systems, lights, wearable gadgets and practically whatever else one can consider. The articles,'utilizing sensors and having organizing capacities would have the capacity to speak with each other, get to Internet benefits and collaborate with the general population. While the collection of information could certainly demonstrate one effective consequence of consolidating data into making a more grounded profile of library benefactors, there must likewise be a mindfulness that the best possible framework should likewise be built to organize the greater part of the components important to connect the frameworks and devices officially utilized by the library.

2. What is Internet of Things?

The objective of the Internet of Things is to empower things to be associated whenever, wherever, with anything and anybody in a perfect world utilizing any way/network and any service. Internet of Things is another revolution of the Internet. Objects make themselves unmistakable and they get knowledge by making or empowering setting related choices on account of the way that they can convey data about themselves. They can get to data that has been accumulated by different things, or they can be segments of complex services. This change is associative with the rise of distributed computing capacities and the move of the Internet towards Internet Protocols with a nearly boundless tending to limit.

Many definitions stress the diverse parts of this issue. *According to Techopedia*[1] "The Internet of Things 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". As per *Whatis*[2] "The Internet of Things is a scenario in which objects, animals or people are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

IoT has developed from the joining of remote innovations, small scale electromechanical frameworks (MEMS) and the Internet. In basic terms, Internet of things empowers, any normal or man-made items to convey each other and exchange information utilizing allocated IP address with or without human mediations.

3. IoT Technology:

The Internet of Things gives arrangements in light of the mix of data innovation, which refers to hardware and programming used to store, recover, and handle information and interchanges innovation which incorporates electronic frameworks utilized for correspondence between people or gatherings. The quick joining of data and correspondences innovation is occurring at three layers of innovation advancement: the cloud, information and correspondence channels/systems, and gadget. The Internet of Things will turn out to be a piece of the texture of regular day to day existence. It will turn out to be a piece of our general foundation simply like water, power, phone, TV and most as of late the Internet. Though the present Internet commonly associates full-scale PCs, the Internet of Things (as a major aspect of the Future Internet) will interface ordinary articles with a solid mix into the physical world.

The fundamental arrangement of advances related to empower IoT to happen, incorporate RFID (Radio Frequency Identification Device), remote specialized devices, for example- Beacons, sensors, vitality collecting advances, distributed computing and advanced Internet convention (IPv6). RFID recognizes and track the information of things, sensors gather and process information to distinguish the adjustments in the physical status of items, vitality harvesting advancements help in low vitality utilization of related advances, for example, Bluetooth, the gathered information is put away on the cloud for further handling and remote correspondence empower association and cooperation between objects to make additionally course of move. These savvy innovations help in improving the force of system and empower littlest articles with ability to associate and interface. Advanced mobile phones would go about as the principle interfacing join amongst items and people in communicating and passing on the messages.

These basic advances said above empower any of the physical items associate with Internet and to each other. Sometimes, there might be a focal center, which helps in associating each of the items. At long last, the cloud administrations which help in accumulation and handling of information to empower people to discover what is going on and make a move utilizing versatile applications.

✓ **Plug and Play Integration**

On the off chance that we take a gander at IoT-related innovation accessible today, there is a colossal heterogeneity. It is normally conveyed for certain reasons and the setup requires noteworthy specialized information and might be unwieldy. To accomplish a genuine Internet of Things we have to move far from such little scale, vertical application storehouses, towards an even framework on which an assortment of utilizations can run all the while. This is just conceivable if associating a thing to the Internet of Things gets to be as straightforward as connecting it to and exchanging it on. Such attachment and play usefulness requires a framework that backings it, beginning from the systems administration level and going past it to the application level.

✓ **Framework Functionality**

The framework needs to bolster applications in finding the things required. An application may run anyplace, including on the things themselves. Discovering things is not restricted to the start-up time of an application. Programmed adjustment is required at whatever point pertinent new things get to be distinctly accessible, things get to be distinctly inaccessible or the status of things changes. The framework needs to bolster the checking of such changes and the adjustment that is required as an aftereffect of the progressions.

✓ **Semantic Modeling of Things**

To achieve the maximum capacity of the Internet of Things, semantic data with respect to the things, the data they can give or the activations they can perform should be accessible. It is not adequate to realize that there is a temperature sensor or an electric engine, yet it is essential to know which temperature the sensor measures: the indoor temperature of a room or the temperature of the refrigerator, and that the electric engine can open or close the blinds or move something to an alternate area. As it may not be conceivable to give such semantic data by essentially exchanging on the thing, the foundation ought to make including it simple for clients.

✓ **Physical Location and Position**

As the Internet of Things is firmly established in the physical world, the thought of physical area and position are vital, particularly to find things, additionally to derive information. Along these lines, the framework needs to bolster discovering things as per area (e.g. geo-area based revelation). Considering, limitation advances will assume an imperative part for the Internet of Things and may get to be distinctly installed into the framework of the Internet of Things.

✓ **Security and Privacy**

What's more, a foundation needs to give support to security and protection capacities including recognizable proof, privacy, trustworthiness, non-denial verification and approval. Here the heterogeneity and the requirement for interoperability among various ICT frameworks sent in the foundation and the asset impediments of IoT gadgets (e.g., Nano sensors) must be considered.

4. WHAT'S PROMISING ABOUT IOT TECHNOLOGIES FOR LIBRARIES?

- ✓ Inventory control
- ✓ Mobile installments, ticketing and occasion enlistment
- ✓ Access and verification
- ✓ Climate and room arrangement, availability and way-finding
- ✓ Mobile reference Resource accessibility for both substance and physical plant (rooms, AV gear)
- ✓ Smart books (highlights enacted/upgraded by other IoT-empowered frameworks)
- ✓ Gaming and expanded reality
- ✓ Object-based learning
- ✓ Assistive innovation

5. Regions to Concern

- ✓ Privacy, security and hacking (by a long shot the biggest concern)
- ✓ The cost of taking part in IoT advancements
- ✓ Staff support and preparing
- ✓ Decline being used of library assets

6. Applications of IoT on Libraries:

- The principal correlation concerning services demonstrated that the IoT could conceivably be utilized as a part of libraries for giving access to conventional and online accumulations and giving authentic and catalog data, just like the case in the business segment. For instance, this innovation could make it simpler for librarians and users to find physical questions in the library and explore through virtual resources. It could likewise be utilized to convey logical insights and data about assets associated with current client interests. The IoT could likewise be conceivably helpful in different zones of library services, for

example, counseling and preparing. In this unique situation, the IoT could be utilized for downloading cutting-edge data about users from their cell phones, for example their state of mind, every day plan, and so on., and customizing instructional classes as per this information. The IoT could likewise be utilized for flagging the accessibility of offices and assets, therefore avoiding user dissatisfaction because of absence of space in the perusing room or inaccessibility of workstations

- Despite the fact that IoT is still in its earliest stages, it has an enormous potential for libraries. Libraries will have the capacity to add more esteem option to their services and offer rich library encounter for benefactors. IoT is about interfacing objects each other online as they are remarkably identifiable. Librarians are now acquainted with this in libraries attributable to the utilization of RFID, which does the comparative thing of associating with machines, labels and overhauls library management framework with passages of books issued to a client, yet in the event of IOT, just the distinction is, it is the Internet communicating with a thing or protest, for example, book. Libraries have books, periodicals, CDs/DVDs, thesis and numerous more physical articles and IoT can be a surprisingly positive development to conquer a portion of the enduring library issues, for example, scattering of items and their utilization. According to Dr. S R Ranganathan's Second Law "Every reader his/her book", libraries can empower them to get to and utilize library assets through virtual library card. It has the immense potential for libraries to advertise their services.
- These days Library services are offered in different structures and with an assortment of devices, for example, talk, mail, online networking, versatile applications, and others. In any case, with regards to their essential nature, it appears that the center of library services can be part into gatherings Firstly, the sharing of data as dates, names, realities and so forth. Besides, the arrangement of list and bibliographic data which helps clients with exploring through library assets and scanning for important wellsprings of data. Thirdly, the arrangement of access to customary and online accumulations as far as loaning materials and making them accessible on location or remotely.
- Data proficiency or introduction is offered to new supporters to teach them about a library, its resources and services. IoT help libraries in giving independently directed virtual tour through the library. at the point when user visit the specific area, their cell phone will play a video or sound clarifying more about that segment and how one can receive greatest advantage in return. It might even ready to give enhanced understanding of unique accumulations, for example, original copies by giving computerized organization of it on their cell phones as physical access to such assets is limited.

- IoT utilizes against different sorts of library exercises likewise uncovered intriguing conceivable outcomes. It appears that despite the fact that the IoT could possibly be much of the time utilized as a part of showcasing and advancement, its helpfulness is not restricted to this range. It could likewise be utilized as a part of process streamlining, library work process association, and the advancement of inventive plans of action that make libraries all the more intriguing for clients and different partners. Utilizing imaginative IoT-based showcasing strategies to advance libraries and sort out occasions could construct the picture of the library as a present day foundation that takes after current patterns. This innovation could likewise be utilized to streamline inner library forms. For instance, assembling, depicting and dissecting assets, keen building innovation, and the best possible storage of resources.
- IoT may help libraries and their clients in better administration of accessible machines in this way sparing the vitality costs. Despite the fact that some of such things are set up in a few libraries, however it might extend the control to library staff as well as to clients. Envision, a client strolling into library, utilizing a desk area or perusing table utilizing their IoT empowered cell phones would have the capacity to control the lighting, ventilating, Wi-Fi and so forth.
- To total up, it can be reasoned that the primary potential zones of IoT use in library services are giving index data and giving access to conventional and online collections. The IoT has potential for counseling and preparing, track and follow services, and the sharing of data.

7. Conclusion:

In spite of a few fruitful activities, the IoT in libraries is still more an idea than reality. It stays to be witnessed what will later on. The potential extent of IoT applications in business, science, diversion and regular day to day existence is immense. In the writing and in the media, distinctive dreams of the advancement of the IoT and the different uses of this innovation can be discovered, some in light of existing tasks, regardless others verging on science fiction. The protection and security of benefactor's information as there is a probability of offering this information to outsiders, which may prompt to hacking. Besides, cost of interest in IoT advances as far as cash, labor and time. Thirdly, staff preparing lastly the most essential thing is decrease in the utilization of physical library. Libraries by taking their supporters into certainty, educating them about protection and security of information and giving the required preparing and framework would have the capacity to actualize IoT to advance their administrations and benefactor's library encounters.

The impediments to the utilization of IoT in the library services are, obviously, budgetary and hierarchical, yet the potential is plainly noticeable. In the zone of library services, the best capability of IoT innovation can be found in procedure of giving access to customary and online resources and giving index data. IoT innovation can likewise be helpful for sharing data, leading counseling or preparing, and giving access to spaces and hardware. IoT innovation may likewise be valuable in other non-benefit library exercises, for example, gathering, portrayal, stockpiling, investigation and choice of resources, showcasing and advancement, and occasion association. Libraries are inclined for change and it has been seen over a time of history, thus IoT would be the following enormous thing after Internet, which will acquire plenty of changes to the library field especially the way library interfaces and speaks with its supporters.

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Awareness of Cloud libraries among the LIS Professionals in Assam: An Analytical Study

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Abstract: The application of advanced technologies in libraries is increasing day by day and the modern libraries are now converting towards paper less or virtual libraries. Cloud Computing facilitates to avoid the locally hosting multiple servers, devices, equipments and constantly dealing with hardware failure, software installation, upgrades and compatibility issues. In Cloud Computing the applications and files are hosted on a "cloud" consisting of thousands of computers and servers that are all linked together and accessible via the internet. Application of Cloud computing in libraries helps to reduce technology cost and increase capacity reliability and performance for some type of automation activities. This paper defines awareness of Cloud libraries among the LIS Professionals in Assam. This paper also highlights the basic concept of cloud computing and cloud based computing services for LIS professionals. The study has covered 50(fifty) LIS Professionals in Assam. A structured questionnaire was designed to collect the data from the LIS Professionals of Assam students. The study has found that highest 80.00% professionals have awareness of OCLC cloud libraries. The maximum (66.00%) of the professionals faced problem to use cloud based services due to inadequate training in ICT applications.

Keywords: Cloud Computing, Cloud Services, Cloud Libraries, LIS Professionals.

1. Introduction:

Cloud computing is simply defined as the applications wherein files are hosted on a "cloud" consisting of thousands of computers and servers, all linked together and accessible via the internet. The "Cloud" element of cloud computing can be seen as an acronym that stands for C- Computing resources, L- that is location independent-accessed via online means, U-used as an utility and D- on demand availability.

According to.Kroski, "Cloud computing means web services for out computing needs which could include using software application, storing data, accessing computing power or using a platform to build applications".

U.S. National institute of standards and technology (NIST) defines, "cloud computing as a model for enabling convenient, on-demand network access to a shared pool of

configurable computing resources (e.g. networks, servers, storage, application and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models and four deployment models". By this definition, the three service models include Software-as-a- Service (SaaS), Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS). Public cloud, Private cloud, Hybrid cloud and Community cloud are the four common deployment models.

2. Scope and limitation of the Study:

The Study covers LIS Professionals in Assam. The LIS Professionals other than Assam have been excluded in this study.

3. Objectives of the Study:

a. To identify the different cloud based computing services for LIS Professionals;
b. To identify the awareness of cloud libraries among the LIS Professionals in Assam; and
c. To identify the barriers for using cloud based services by the LIS Professionals in Assam.

4. Methodology:

A questionnaire was designed to collect data from the LIS Professionals in Assam. The population consists of 50 (fifty) LIS Professionals in Assam. Analysis of data is the ultimate step in research process. It is the link between raw data and significant results leading to conclusions. The data were analyzed using frequency counts and simple percentage to answers the research questions. The results are also graphically represented by pie diagram.

5. Result and Discussion:

Analysis of different cloud computing services:

- The following are the different cloud computing services which are used by library and information professionals for day to day library activities as well as for personal activities.
- Mailing services: The mailing services have been frequently used by the library science professionals. Gmail, Yahoo, Hotmail, Fastmail, Lycos are ex-

ample of mailing services.

- Custom Social networking: A custom social networking is an online service, platform or site that focuses on building and reflecting of social network or social relations among people who share interest and activities. Social networking often involves grouping specific individuals or organizations together. The social networking site includes Facebook, Twitter, LinkedIn, YouTube, Wikipedia, Blog, Slideshare, Ning etc.
- Information Collection: Information Collection is the process of collecting and gathering data on a targeted variable. Google Forms, Survey monkey, Poll everywhere, Qualtrics, Zoomerang, Wu Foo etc are example of information collection.
- Calendar: Cloud calendar is a time management which is designed to save the time. Google Calendar and Hotmail Calendar are the examples of cloud calendar.
- File Sharing and storage: Cloud based file sharing or online file sharing is a system which a user allowed storage space to backup their data and file. Dropbox, SlideShare, Google Drive, Just Cloud, Sugar Sync, Egnyte etc are example of cloud file sharing and storage.
- Video and Presentation: You Tube, Vimeo, Screen Cast, Jing, Prezi, Slide rocket, Google Presentation, Spicy nodes etc are good example of Video and Presentation.
- Software and Application: Cloud based software is application program that function in the cloud. Some common cloud based softwares are QR Stuffs, Google Sites, Zotero, Diigo, Delicious, Bundle But etc.
- Operating Systems: Cloud operating system is designed to operate within cloud computing and virtualization environments. Microsoft windows azure and Google chrome OS are examples cloud operating systems
- Office Application: Google Docs, MS Office Online, Cloud- canvas, Write are examples of office application where users can work on the cloud.

Awareness of Cloud libraries:

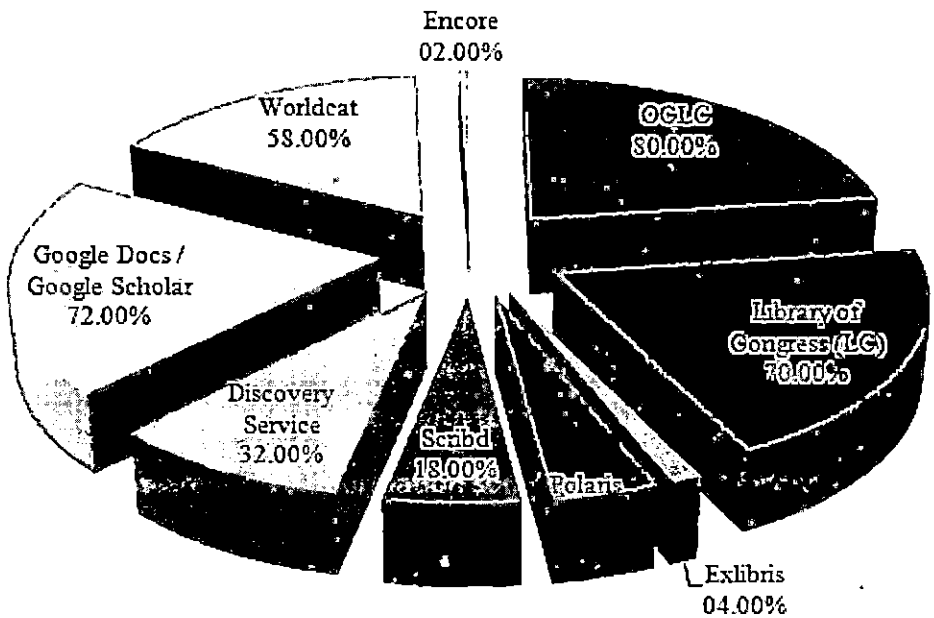
Table 1: Awareness of Cloud libraries

S. No	Cloud libraries	Response	% of Response(n=50)
1	OCLC	40	80.00%
2	Library of Congress (LC)	35	70.00%
3	Exlibris	02	04.00%
4	Polaris	07	14.00%

5	Scribd	09	18.00%
6	Discovery Service	16	32.00%
7	Google Docs / Google Scholar	36	72.00%
8	Worldcat	29	58.00%
9	Encore	01	02.00%

Table 1 showes that the highest 80.00% professionals have awareness of OCLC cloud libraries. The 2nd highest 70.00% of the professionals have awareness of Google Docs / Google Scholar cloud libraries. This is slightly followed by Library of Congress (LC) which 70.00% of the LIS professionals responded. More than half of the professionals i.e. 58.00% have responded on Worldcat cloud libraries. A small amount of the professionals i.e. 32.00% responded on Discovery Service, 14.00% on Polaris and 04.00% on Exlibris. The very least 2.00% of the professionals have awareness on Exlibris. The status of awareness of Cloud libraries among the Professionals have been diagrammatically represented by the fig 2.

Fig 1: Awareness of Cloud libraries



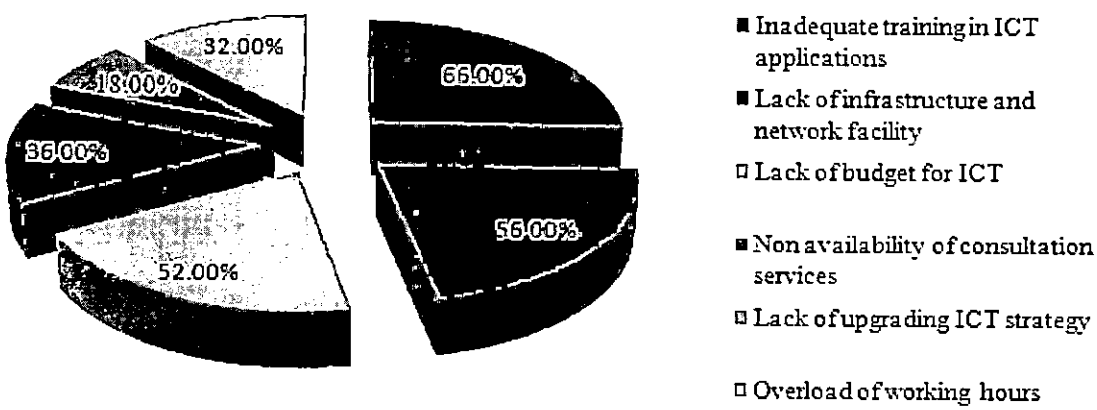
Barriers of using Cloud based services:

Table 2: Barriers of using Cloud based services

S. No	Barriers	Response	% of Response(n=50)
1	Inadequate training in ICT applications	33	66.00%
2	Lack of infrastructure and network facility	28	56.00%
3	Lack of budget for ICT	26	52.00%
4	Non availability of consultation services	18	36.00%
5	Lack of upgrading ICT strategy	9	18.00%
6	Overload of working hours	16	32.00%

Table 2 shows that maximum (66.00%) of the professionals have responded that they feel problem due to inadequate training in ICT applications and followed by lack of infrastructure and network facility(56.00%) and lack of budget for ICT (52.00%). Less than half (36.00%) of the professionals responded that they feel problems due to non availability of consultation services and followed by overload of working hours(32.00%). The least 18.00% professionals faced problem due to Lack of upgrading ICT strategy.

Fig 2: Barriers of using Cloud based services



6. Conclusion:

From this survey it is found that the maximum numbers of LIS Professionals of the Assam have awareness of OCLC cloud libraries. They have faced some problems for using cloud based services and among them the highest numbers of professionals faced inadequate training in ICT applications. A very good ICT infrastructure with proper

networking and high speed internet facilities will help to upgrade the LIS professionals to cope up latest and updated technologies and services.

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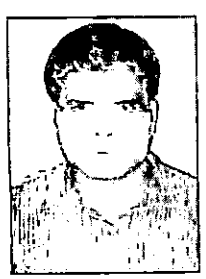
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Characteristics of Big Data Prospects in Academic Libraries: An Overview

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Abstract: The main aim of this article is to review the idea of Big Data. Firstly, a definition of the term and the important characteristics of Big Data are given. Libraries traditionally have been vast warehouses of data, information, and access points to research and this will continue in the era of Big Data. Clearly, all librarians, but especially business librarians, will have to be aware of current resources for data harvesting and manipulation and key business intelligence to best serve their patrons and academic institutions. The article explores relevancy of the term "Big Data" with Information Science and in general context. As libraries evolve to provide more data services, there is an opportunity for Information professionals to become experts and authorities in the data age.

Keywords: Big Data, Information, classification, characteristics

1. Introduction

The 21st century known as information age. Data or information plays a significant role in socio-economic development of individual, society and nation. Nobody can carry on without appropriate or relevant information. Data is important part of research and development programmes and resolve social, economic problems of nation. Many research and development progrmaames in research laboratory, institution and university form a new data. Over the past 20 years, data has been increased in a large scale in various fields. There is a tsunami of data that is crashing onto the beaches of the civilized world. This is a tidal wave of unrelated, growing data formed in bits and bytes, coming in an unorganized, controlled, confused dissonance of foam. It is filled with the sticks and bones and shells of inanimate and animate life. The tsunami is a well of data – data produced at greater and greater speed, greater and greater amounts to store in memory, on tape, on disks, on paper, sent by streams of light faster, more and more and more. As a result, the vast amount of data and information available for organizations for analysis is exploding. This provides organizations with completely new operating possibilities, while simultaneously generating numerous new challenges. In this context the term —Big Data has emerged and is being used more and more commonly in the knowledge wisdom.

2. Big Data Concept

Big Data is a loosely defined term used to describe datasets which are immense and intricate that it became awkward to work with using standard statistical software. The rise of digital and mobile communication has made the world become more connected, networked, and traceable and has typically lead to the availability of such large scale datasets. The big data can be viewed in different ways. It states that- "Big data" refers to datasets whose size is beyond the ability of typical database software tools to capture, store, manage, and analyze. It is intentionally subjective and incorporates a moving of how big a dataset needs to be in order to be considered big data—i.e., we don't define big data in terms of being larger than a certain number of terabytes (thousands of gigabytes). By this definition we can infer that the big data is not subjective to the amount of data only, for a data to be referred to as big data, other aspects of the data are also need to be considered.

3. Definition

Big Data is also called as Very large data, Extreme data, and Total data, etc. and the first criterion was the volume of data. Although there is no exact definition of Big Data, it sometimes refers to more data than ZB (Zeta Byte) range and also means data which require distributed parallel processing technology for the analysis of large volume of data such as Hadoop.

Big Data is a term which defines the hi-tech, high speed, high-volume, complex and multivariate data to capture, store, distribute, manage and analyze the information.

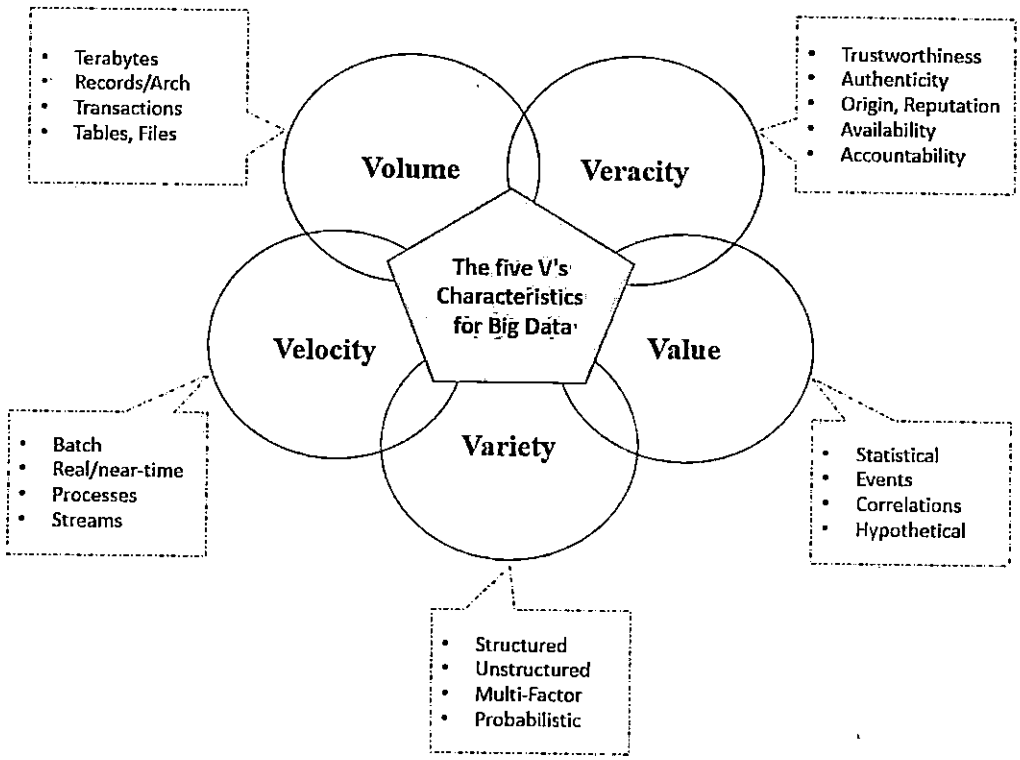
Big data is high volume, high velocity, and/or high variety information assets that require new forms of processing to enable enhanced decision making, insight discovery and process optimization (Gartner, 2014; Gürsakal, 2014).

As the definitions suggest, there are some points to take into consideration in big data sets. The data should be complex and multiple together with its size. Therefore conventional methods have difficulty in analyzing big data sets and new methods and technologies are needed.

4. Characteristics of Big Data

Big Data is important because it enables organizations to gather, store, manage, and manipulate vast amounts data at the right speed, at the right time, to gain the right

insights. In addition, Big Data generators must create scalable data (Volume) of different types (Variety) under controllable generation rates (Velocity), while maintaining the important characteristics of the raw data (Veracity), the collected data can bring to the intended process, activity or predictive analysis/hypothesis. Indeed, there is no clear definition for 'Big Data'. It has been defined based on some of its characteristics.



Five Vs Big Data Characteristics

Volume: refers to the quantity of data gathered by a company. This data must be used further to gain important knowledge. Enterprises are awash with ever-growing data of all types, easily amassing terabytes even petabytes of information (e.g. turning 12 terabytes of Tweets per day into improved product sentiment analysis; or converting 350 billion annual meter readings to better predict power consumption). Moreover, Demchenko, Grosso, de Laat and Membrey stated that volume is the most important and distinctive feature of Big Data, imposing specific requirements to all traditional echnologies and tools currently used.

Velocity: refers to the time in which Big Data can be processed. Some activities are very important and need immediate responses, which is why fast processing maximizes efficiency. For time-sensitive processes such fraud detection, Big Data flows must be

analyzed and used as they stream into the organizations in order to maximize the value of the information (e.g. scrutinize 5 million trade events created each day to identify potential fraud; analyze 500 million daily call detail records in real-time to predict customer churn faster).

Variety: refers to the type of data that Big Data can comprise. This data maybe structured or unstructured. Big data consists in any type of data, including structured and unstructured data such as text, sensor data, audio, video, click streams, log files and so on. The analysis of combined data types brings new problems, situations, and so on, such as monitoring hundreds of live video feeds from surveillance cameras to target points of interest, exploiting the 80% data growth in images, video and documents to improve customer satisfaction));

Veracity: refers to the degree in which a leader trusts information in order to make a decision. Therefore, finding the right correlations in Big Data is very important for the business future. However, alone in three business leaders do not trust the information used to reach decisions, generating trust in Big Data presents a huge challenges as the number and type of sources grows.

Value: refers to the important feature of the data which is defined by the added-value that the collected data can bring to the intended process, activity or predictive analysis/ hypothesis. Data value will depend on the events or processes they represent such as stochastic, probabilistic, regular or random. Depending on this the requirements may be imposed to collect all data, store for longer period (for some possible event of interest), etc. In this respect data value is closely related to the data volume and variety.

5. Classification of Big data

Classification is one of the data mining techniques that classify unstructured data into the structured class and groups and it helps to user for knowledge discovery and future plan. Classification provides intelligent decision making. There are two phases in classification, first is learning process phase in which a huge training data sets are supplied and analysis takes place then rules and patterns are created. Then the execution of second phase start that is evaluation or test of data sets and archives the accuracy of a classification patterns. This section briefly describes the supervised classification methods such as Decision Tree and Support Vector Machine.

6. Decision Tree (DT)

Decision Tree is ideal to use as the filter to handle the large amount of data. DT is a basic way of classification can have satisfactory efficiency and accuracy of those datasets. Decision Tree algorithm is good at tuning between precision which can be trained very fast and provide sound results on those classification data. Big Data are now rapidly expanding in all domains with the fast development of networking and increase in the data storage and collection capacity. The instances are divided into a set of discrete valued set of properties, known as various features of the data. Decision Tree learning is reasonably fast and accurate. The approach is to learn on large data sets is to parallelize the process of learning by utilizing Decision Trees. It is straightforward to reduce a Decision Tree to rules.

7. Support Vector Machine (SVM)

Support Vector Machine is a Machine Learning tool used for classification that is based on Supervised Learning which classifies points to one of two disjoint half-spaces. It uses nonlinear mapping to convert the original data into higher dimension. Its objective is to construct a function which will correctly predict the class to which the new point belongs and the old points belong. In the era of Big Data, the main reason behind maximum margin or separation because if we use a decision boundary to classify, it may end up nearer to one set of datasets compared to others. This happens only if data is structured or linear but mostly we find data is unstructured /nonlinear and dataset is inseparable then SVM kernels are used.

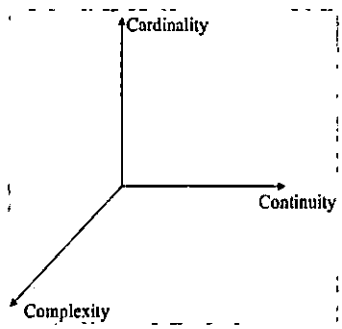
8. Management of Big Data

The cardinality parameter demands the need for an efficient distributed file system for data capture, storage and analysis of network traffic for intrusion prediction. Then the continuity and complexity parameters add extra difficulties to the task of managing the Big Data. Hence the network topology must be designed in such a way that the Big Data Analytics problem can be handled efficiently with cost effectiveness objectives.

Network Topology: The modern computer technologies, like HDFS and public cloud, can help alleviate the cardinality problem in Big Data analytics. They can be integrated to build a large and flexible network topology with a storage infrastructure that can change adaptively based on the need of the Big Data processing requirements. However this integrated model will bring several challenges that must be handled efficiently. It consists of four units: user Interaction and Learning System (UILS), Network Traffic

Recording System (NTRS), HDFS and Cloud Computing Storage System (CCSS).

The NTRS unit helps to capture network traffic and streams the traffic data to HDFS unit or CCSS unit in real-time based on the need of an additional storage. The HDFS system will also use Hive database to store the data. The UILS unit can learn and control the additional storage and data requirements.

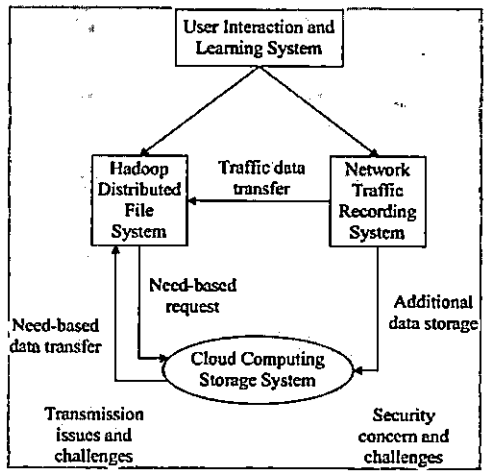


9. Communication Challenges

In computer networking research and applications, the communication cost is the major concern compared to the processing cost of the data the same in this suggested topology. The challenge here is to minimize that communication cost while satisfying the additional storage and data requirement from public cloud for processing Big Data. The bandwidth and latency are the two major network features that will affect the communication between the clients and the cloud server. These problems and associated challenges to find solutions will adversely affect the timing requirements of the Big Data processing at HDFS and UILS. Hence the machine learning techniques, using these technologies, must be developed by keeping these problems and challenges in mind.

10. Security Challenges

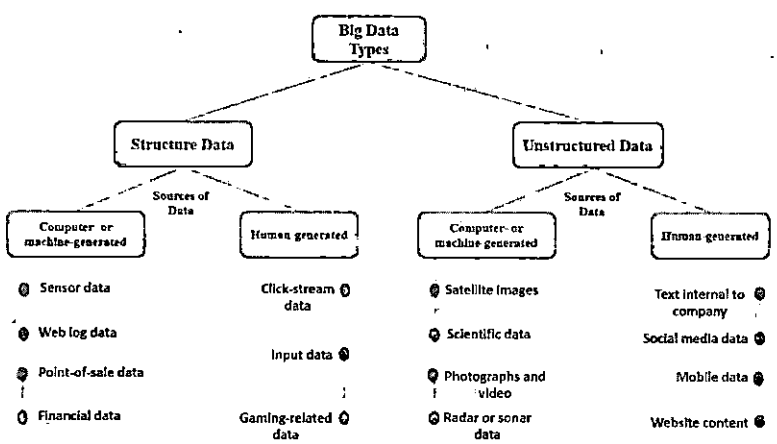
The security mechanism in cloud technology is generally weak. Hence, tampering of data at the public cloud is inevitable and it is a big concern. Finding a robust security mechanism for the purpose of using the public cloud like CCSS is a challenging problem. In cloud technology, an attacker can easily tamper the data that is being exchanged between the CCSS server and the HDFS and NTRS units; the attacker can spoof the reply between them and shut down the server (CCSS) using DOS attack. These problems can lead to challenges in implementing Big Data analytics tool with the suggested network topology.



Suggested network topology for Big Data analytics.

11. Big Data types

Big Data encompasses everything; from dollar transactions to tweets to images to audio. Therefore, taking advantage of Big Data requires that all this information to be integrated for analysis and data management. This is more difficult than it appears. There are two main types of data concerned here: structured and unstructured. Structured data is like a data warehouse, in which data is tagged and sortable, while unstructured data is random and difficult to analyze. The Figure below depicts these types, along with examples:



Big Data Types

12. Information Professionals and Big Data

Users with the data or information they desire. Traditionally, this has involved directing users to reference books, article indices and abstracts, journal literature, and statistical sources all across widely varying subject areas. It was the role of the librarian to analyze and interpret specifically what users wanted to know and what information sources would satisfy those questions. This has changed however in the growing boom of data that is collected and harvested as commercial resources focusing on data, statistics, and numeric datasets has grown rapidly. Librarians must now also be able to provide "the same level of service to data as they already bring to other formats of information.

Historically, libraries have provided access to data and statistical sources in the form of various Census and US Government statistical publications. While "numeric datasets have not always been associated with traditional library collections", the shift to more data-centric resources came in 1962, when the Inter-university Consortium for Political and Social Research (ICPSR) produced its data archive focusing on voting patterns and behaviors. Beginning with punch cards and magnetic tape, the ICPSR now has a "data archive of more than 500,000 files of research in the social sciences", available in raw format such as SAS or ASCII for analysis. The need for more transferrable, manipulative, and actionable data was born and an ever-growing need to fulfill the access to these resources became integral to the work of libraries and librarians.

13. CONCLUSION

Information professionals have all the time worked with data in order to meet the information needs of their users, thus "Big Data" is not a new idea for them though it is spawning new approaches along with a language all its own. Today, this need for access to data has grown even further as government, companies, and organizations compile and gather amounts of data that are considered almost too big to process by conventional technology. Big Data is generally defined as "datasets whose size is beyond the ability of typical database software tools to capture, store, manage, and analyze". The datasets are considered huge and need to be managed by tools that can handle terabyte and petabyte amounts of data. The size and type of data can also vary widely by industry and organization. It can go beyond the traditional and contain more "unstructured data" such as Face book posts, Twitter feeds, "email messages, photographs, postings on Internet forums, and even phone transcripts". In today's world of social media, mobile purchasing, and location tracking, these are all sources of personal data that might impact businesses and their ability to reach key markets and analyze spending habits. Any of which can provide them with a competitive advantage.

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CLOUD COMPUTING: A NEW VISION

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Abstract: Cloud computing is a resource, emerged as a critical component, which is very useful for Digital Information Storage and Library functioning. The basic understanding about cloud computing and its applications in library and information science, (through the cloud computing) are presented in this paper. As the cloud computing is a latest technologies adapted to computers, which is highly useful and helpful in Information Storage and Retrieval, particularly in automated environment. Its applications in the context of digital libraries, and the organization of e-resources and its storage and dissemination were discussed comprehensively. An attempt is also made to present the types of cloud computing models, cloud computing platforms, and its applications in library and information science is discussed. The conceptual methods, systems, and the related technicalities and its programming areas are not covered in this paper.

1. INTRODUCTION:

The cloud computing is a latest version of technologies, next to digital libraries in the context of Information Storage and Retrieval System. The cloud computing brought a sea change in Information Technology (IT) and its traditional obligation, which empower the end users on demand by using computers. Cloud computing is becoming of the third generation revolution in the field of library and Information Science. The cloud computing is a means of access from computer to Internet, thus the cloud computing architecture stands as a tool, and providing different ways to retrieve electronic and digital information and resources to meet the user needs. Today libraries are dealing with a large number of resources and users, and the cloud computing technology provides variety of platforms in which users can browse a physical shelf of book, CDs or DVDs or choose to access an item or scan a barcode into his mobile services. The cloud computing provides easy access to databases, rare and important document. In this present paper, the researcher wants to mention few Cloud computing applications are: viz.1. Web mails i.e. Gmail &Yahoo mail, 2. Online Storage systems i.e Gdrive, Sky drive, Idrive; 3. Web based official tools; like Google 4. Web based Readers i.e Bloglines, Google Reader etc 5. Entertainment i.e.YouTube, Flicker; 6. Social networking i.e. Facebook, Orkut etc.

2. OBJECTIVE OF THE STUDY:

1. To know the Importance of cloud computing and its applications in library and information centers in Information Storage Retrieve activities.
2. To examine the dimensions of the Cloud Computing, types of cloud computing and different platforms of cloud computing,
3. To assess the cloud computing use in traditional libraries as well in digital libraries, and its impact in library Automation.

3. METHODOLOGY:

This study is a descriptive and theoretical based on the latest reviews of literature on the selected areas of Cloud Computing. The data and literature collected from the current journals and also from secondary sources which are available at Dr.V.S.Krishna Library Visakhaptnam and Dr.B.R.Ambedkar Univerisity, Srikakulam, and also consulted the various forms with regard to Print materials and non- print materials and Electronic sources related to the specific areas of the cloud computing, as per the objects of the present study; was analyzed and presented to create awareness among the Library professionals.

4. DEFINITION: CLOUD COMPUTING

Cloud computing is not a new technology that suddenly appeared on the web but it is a latest form of computing. Cloud computing is a kind of computing technology which facilitate in the field of Library and Information Science in the areas of resource sharing, collection development, storage, organization and management of the resource; processing of the resources, dissemination of information, analysis and information service; over the internet using local servers / nodes or personal devices. The combination of servers, networks, connections, applications and resources is defined as a cloud computing is acting as a resource pooling technology for accessing infinite information services. The cloud computing provide services, resources as per users demands and can be compare with models of pay as you use or utility model same as; for mobile services usage and electrically consumption.

Cloud computing is a revolutionary, and latest technologies, which are universally available systems which makes utility of computing possible with pay as you go and infinity of scalable, and the technology is built upon is a evolutionary.

Erik Mitchell, defined could computing as a " pay for what you use" model, which is easy to replicate, service- focused and scalable. The benefits of cloud computing, as it saving time, reducing personnel and eliminating hardware. Cloud

computing offers benefits of efficiency, lower cost and ease by demonstrating the "business cloud" Mitchell showed how cloud computing has been adopted by many commercial applications.

The definition of cloud computing is the practice of storing regularly and the used computer data on multiple servers which can be accessed through the internet. (Merrim Webster Dictionary)

Buyya et al. have defined it as follows: "A Cloud is a type of parallel and distributed, system consisting of a collection of inter-connected and virtualized computers that are dynamically provisioned and presented as one or more unified computing resources based on service-level agreements established through negotiation between the service provider and consumers."

Gartner IT Glossary defines cloud computing as a style of computing in which scalable and elastic IT-enabled capabilities are delivered as a service using Internet technologies

According to NIST "Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction"

According to Sosinsky "Cloud computing takes the technology, services and applications that are similar to those on the Internet and runs them into a self-service utility".

The use of the word "cloud" makes reference to the two essential concepts:

- **Abstraction**: Cloud computing abstracts the details of system implementation from users and developers. Application run on physical systems that are not specified, data is stored in locations that are unknown, administration of systems is outsourced to others, and access by users is ubiquitous.
- **Virtualization**: Cloud computing virtualizes systems by pooling and sharing resources. Systems and storage can be provisioned as needed from a centralized infrastructure. Costs are assessed on a metered basis, multi-tendency is enabled and resources are scalable with agility"

This cloud model is composed of five essential characteristics, three service models, and four deployment models.

5. ESSENTIAL CHARACTERISTICS

National Institute of Standards and Technology's definition of Cloud Computing recognize five essential characteristics as follows:

1. **On-demand Self-service**: Customer can adjust their services without needing anyone helps for best of broad self services and provide users the ability to upload, built , deploy, schedule, mange and report on their business on demand
2. **Ubiquitous Network Access**: available through standard Internet enabled devices,
3. **Resource Pooling:** Processing and storage demands are balanced across a common infrastructure with no particular resources assigned to any individual user.
4. **Rapid Elasticity:** Consumers can increase or decrease capacity
5. **Measured Service:** These services based on consumer pay for only what resources used and are therefore charged.

6. TYPES OF CLOUD COMPUTING SERVICES

Cloud computing entrust remote services with the user's data, software and computation. Its separated into two distinct sets of models according to widely accepted by NIST:

Deployment models (four types)

1. Private, 2) Community, 3) Public and 4) Hybrid, and these four types of deployment models refers to location and management of cloud's infrastructure

7. A. DEPLOYMENT MODELS

1. Private Cloud. The cloud infrastructure is operated for exclusive use by a single organization comprising of multiple consumers. It may be present either, off premises or owned managed, and operated by the organization, or by third party, or some combination of them.

2. Community Cloud. Community clouds are stipulated for exclusive use by a Particular community of consumers from organizations that have shared concerns

3. Public Clouds. An academic, government, or business organization, or a combination of them can own and operate a Public cloud. It exists on the premises of the cloud provider and is opened for the use of general public.

4. Hybrid Cloud. A hybrid cloud is a combination of public, community or private cloud. It is also known as combined cloud. In hybrid cloud, private and public clouds, retain their unique identities but are bound together by standardized or proprietary technology that enables data and application portability. An example of hybrid cloud is Google Apps.

8. B.SERVICE MODELS (THREE TYPES)

SAAS, PAAS and IAAS the three different service models taken together rare known as SPI Models of cloud computing. These service models consist of the specific and particular types of services, that can be accessed on a cloud computing platform.

Service Models:

1. Software as a Service (SaaS): Software as a Service (SaaS) makes use of a cloud computing infrastructure to deliver one application to many users, regardless of their location. It allows activities to be managed from central locations in a one-to-many model, including architecture, pricing, partnering, and management characteristics. Some of the examples of SaaS cloud service providers are Google Apps, Sales Force. com, SQL Azure, Twitter, Microsoft and Oracle On Demand.

2 Platform as a Service (PaaS): Provides virtual machines, operating systems, applications, services, development frame works transactions and control structures. The client can deploy its applications on the cloud infrastructure or use applications that were programmed using languages and tools that are supported by the PaaS service provider. While client is responsible for installing and managing the application that it is deploying; the service provider manages the cloud infrastructure, the operating systems and enabling an example of PaaS service is that SalesForce.com opened an API called the Force API that allowed developers to create applications based on the Sales-Force.com technologies. Other important examples of PaaS are Google App Engine, Windows Azure cloud services, Openshift, Force.com

3 Infrastructures as a Service (IaaS): Offering virtualized resources (computation, storage, and communication) on demand is known as Infrastructure as a Service (IaaS). There are many service models described in literature such as Network as a Service (Naas), Storage as a Service (SaaS), Backup as a Service (BaaS) etc. The entire model stakes the form as XaaS or something as a service "Anyway SPI services cover all the other possibilities i.e. everything as a Service (EaaS).

9. MAJOR CLOUD COMPUTING INITIATIVES IN LIBRARIES

The widely used web cataloguing tools of OCLC are the most prominent example of cloud computing in the library arena

1. **Goole Apps**: Allows migration from desktop to web-accessible applications, such as communication tools (Gmail, Google Calendar and Google Talk) and productivity tool (Google Docs: text files, spread sheets and presentations)
2. **OCLC's:** World share management Services (WMS) allows libraries to manage entire collection management life cycle in a cloud based application. It offers unified web based application form acquisition and circulation to metadata and licensing management resource sharing and analytics
3. **Ex-Libris:** A leading library software vendor from USA, who initially implemented solutions as locally and at a later stage adapted them to a hosted environment. The company's next generation library system, Alma, was conceived as a cloud based service to transform the traditional management of library resources.
4. **OSS Labs:** India is using Amazon's elastic cloud computing platform and offering Koha ILS and Dspace institutional repository hosting and software maintenance subscription services for libraries
5. **Duraspace**: With a collaboration of the Dspace digital library software and Fedora Commons provide repository service for all type of libraries and also for consortia. Its new service Dura Cloud offers complete solution for digital library with open sources code and the code needs to be installed on your machine
6. **Dropbox**: Is a file hosting service operated by Dropbox, Inc that offers cloud storage, file synchronization and client software. Dropbox allows users to create a special folder on each of their computers regardless of which computer is used to view it.
7. **Polaris:** A Polaris Library Automations system provides standard acquisition and processing system. The system uses number of well known standards like MARC21 for bibliographic data, XML, Z39.50 for information retrieval, Unicode etc.
8. **LibLime**: Hosted in Lib Lime's distributed cloud computing data center, hundreds of libraries are able to alleviate their internal IT support needs.

10. ADVANTAGES OF CLOUD COMPUTING

1. Cost saving

2. Flexibility and innovation
3. User Centric
4. Openness
5. Transparency
6. Interoperability
7. Representation
8. Availability anytime anywhere
9. Connect and converse
10. Create and collaborate
11. Easy operation
12. Out sources IT management
13. Easy maintenance and upgrade
14. User oriented
15. Connectivity and converse
16. Backup and recovery
17. Cloud Environment and friendly
18. Scalability and performance
19. Quick development

11. DISADVANTAGE

1. Internet reliability
2. Dependence on the Supplier
3. Risk or Data loss
4. Constants connectivity required
5. Quality problems with cloud service provider
6. Time and Budget constraints
7. Since all the developments and deployment have been done by Cloud service provider. It is very difficult to get good grip on overall system

12. CONCLUSION

To cope with the new Technologies and innovation in the field of Library and information Science one need to know about the importance of cloud computing its applications in the LIS education. The cloud computing has its own merits and demerits. Moreover the newly established libraries and Information centers, which do not have sufficient budget to acquire high-end technologies with proper hard ware and software

can opt and choose cloud. The vision is to use cloud computing to deliver library resources, services and expertise at the point of need, within user work flow and in a manner that users want and understand. The cloud computing Technology was free from libraries management but they can focus more on collection building, improved services and innovation. The cloud computing model will encourage libraries and their users to participate in a network and community of libraries by enabling them to reuse information and socialize around information.

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Cloud Computing: Its Impact and Influence on Library Management and Services

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Abstract: Cloud computing is another idea and procedure of Information Communication Technology period in light of its conceivable advantages, for example, dense cost, available anyplace at whatever time and its adaptability. Cloud computing is enhancing and will extend the possibility of human learning, engage human capital for feasible advancement and in addition instructive improvement of the countries. The innovation is utilized to do of putting away, getting to and sharing information, applications and figuring power in the internet. This innovative improvement has acquired an emotional change each field and libraries are not exemption to this marvel. This paper intends to show profoundly organized different parts of Cloud computing, its uses in the field of library and data focuses. This paper additionally tries to give clear thought that how cloud innovation help libraries to give a superior support of the client group.

Keywords: Cloud Computing, Models of Cloud Computing, Role of Cloud Librarian, use of cloud in Libraries.

1. Introduction:

Today in this technological era, Information is exploring at large scale and information needs of the users are also growing rapidly. To meet the peculiar information needs of the knowledge society and to provide better services, libraries are improved constantly by adopting many new technologies. The recent technology trends in library and information centers introduction & use of cloud computing as a strategic tool for the purpose of providing seamless library services with quality in a cost effective manner.

Cloud Computing is a completely new Information Technology and it is known as the third revolution after Personal Computer and Internet in Information Technology and is

an emerging style of computing where applications, data and resources are provided to the users as a service over the web, is the improvement of Cloud Computing, Parallel Computing, Grid Computing and Cloud Databases. And the basic principle of Cloud Computing is making tasks Cloud in large numbers of Cloud computers but not in local computers or remote servers and its provides people the way to share Cloud resources and services that belong to different Organizations or sites.

The Cloud computing resources have also become more powerful and also available cheaply. Its can help libraries collaborate with each other in a facile manner. Every library has its own electronic data resources. If all electronic data resources are put together in a single place which may be accessed by a group of libraries, the whole electronic data base will become huge and useful to all patrons

2. Concept of Cloud Computing:

Processing has developed for outsourcing of registering foundation, stockpiling of customer information and applications that are gotten to by means of a remote server" (Hosch, 2009; Knorr and Gruman, 2008). Generally organizations sold item CDs and one needed to purchase a permit to utilize them. Presently may organizations like Tally, Frank Borland items give membership benefits on the web, without the requirement for the client to set up anything and pay on month to month or yearly premise or only for the use? Cloud computing additionally gives a typical figuring stage where clients can assemble their own particular applications for use by others through the web.

3. What is Cloud Computing?

Cloud computing is another innovation demonstrating for Information Technology administrations which numerous associations and people are receiving. Cloud computing can change the way frameworks are manufactured and benefits conveyed, giving libraries a chance to broaden their effect. Cloud computing is the change of Cloud Computing, Parallel Computing, Grid Computing and Cloud Databases. Furthermore, the fundamental standard of Cloud Computing is making undertakings appropriated in expansive quantities of conveyed PCs however not in nearby PCs or remote servers. It permits client to get to programming applications, store data, create and test new programming, make virtual administrations, drawn on different Information Technology assets and all the more everywhere throughout the Internet or other system.

4. Meaning of Cloud Computing:

As indicated by Wikipedia: "Cloud computing is Internet-based processing, whereby shared asset, programming, and data are given to PCs and different gadgets on request, similar to the power framework."

5. Goals of the Paper :

The prime goals of the paper/study were, to investigate the idea of Cloud computing and what it in connection with library and data focuses and its administrations in establishments of advanced education with a primary concentrate on libraries.

6. Cloud computing Models:

1. **Software as a Service (SaaS):** This gives have benefit like information stockpiling programming, foundation, and the UI. Cloud based programming administrations, for example, client assets administration is additionally given by SaaS. This administration display gives stockpiling, free administrations, online email applications, boundless and remote access from any PC gadget with an Internet association. Cases of SaaS are Google Docs, Face book, Web mail, Whatsapp, climb.

2. **Platform as a Service: (PaaS)** Cloud shippers are organizations that delicate Cloud computing administrations and items. One of the administrations that they offer is called PaaS. Under this a processing stage, for example, working framework is given to a client or end client on a month to month rental premise. A portion of the key Cloud computing merchant is Amazon, Microsoft, and Google and so on.

3. **Infrastructure as a Service: (IaaS)** It gives essential stockpiling and figuring abilities as institutionalized administrations over the system. Servers, stockpiling frameworks, organizing hardware, server farm space and so forth are pooled and made accessible to handle workloads. The client would commonly convey his own product on the framework. Some normal illustrations are Amazon, GoGrid, 3 Tera, and so forth.

7. Cloud deployment models as follows:

- **Private cloud:** The cloud infrastructure is functions exclusively for a society. It may be maintained by the organization or a third party and may exist on premise or off premise.

- **Hybrid cloud:** A hybrid cloud is a mixture of public and private cloud. It is also identified as combined cloud. In hybrid cloud, private and public clouds keep their unique identities but are bound together as a unit. A hybrid cloud may offer standardize or proprietary access to data and applications, as well as application portability. An example of hybrid clouds is Google Apps.

- **Community cloud:** Community clouds are exclusively organized clouds, to serve a common function or purpose. It may be for a particular organization or a group of organization, but they share common concerns such as their mission, policies, security, and so on. It can be managed by the organization itself or by third party.

8. Role and Use of Cloud Computing in Libraries:

In this innovative period, libraries are enhanced continually by receiving numerous new IT advances. The hypotheses of routine libraries have been changed now a day. Presentation of new and creative advancements like cloud innovation helps libraries to give better administrations to the client group.

Cloud computing offers many fascinating conceivable outcomes for libraries that may diminish innovation cost and increment limit dependability, and execution for some kind of robotization exercises. Distributed computing has made solid advances into other business segments and is presently starting to discover more application in library science. The distributed computing pushes equipment to more digest levels. The vast majority of us are familiar with quick processing force being conveyed from frameworks that we can see and touch.

Cloud computing is an improvement of Cloud processing, parallel figuring, network registering and Cloud databases. Among these, lattice and utility figuring are known as ancestors of distributed computing.

Cloud computing has substantial potential for libraries. Libraries may put increasingly content into the noisy. Utilizing distributed computing client would have the capacity

to peruse a physical rack of books, CDs or DVDs or take out a thing or output a standardized tag into his cell phone. All recorded and uncommon archives would be checked into a far reaching, effortlessly searchable database and would be open to any specialist. Numerous libraries as of now have online inventories and impart bibliographic information to OCLC. More incessant online lists are connected to consortium that share assets.

Information storage cloud is a principle capacity of libraries, especially those with computerized accumulations putting away substantial advanced documents can stretch nearby server foundations. Cloud computing or IT framework that exists remotely, frequently gives clients expanded limit and less requirement for overhauls and support , and has increased more extensive acknowledgment among bookkeepers

Library and Information benefits by the utilization of Cloud computing as takes after,

- ✓ ***E-books Lending Service*:** Cloud stage is presently getting to be distinctly well known to loan the E-Books.
- ✓ ***Union/Shared Catalog/OPAC:*** Network libraries can utilize same stage and offer access to their accumulation on one stage. Through Cloud computing production of union index turns out to be simple.
- ✓ ***Document Download Service:*** One can download reports effortlessly if allow access in the system.
- ✓ ***Digital conservation/Scanning Service*:** Digitization and examining work should be possible brought together thus one can stay away from duplication of such tedious work. Libraries can save the gathering is advanced frame as chronicles.
- ✓ ***Article Delivery Service*:** Cloud processing can be utilized for article conveyance administration to the benefactors by the libraries. Distributers are as of now utilizing this innovation for giving access to libraries.
- ✓ ***Current Awareness Service*:** To give current mindfulness administration to all benefactors has turned out to be simple with Cloud computing.
- ✓ ***Document Sharing*:** Document offering has turned out to be anything but difficult to Cloud computing.
- ✓ ***Bulletin board benefit:*** We can give new administrations on notice board with this innovation.

- ✓ ***Information Common***: Information basic like bibliographical information, content pages, cover pages, address papers, syllabus, and other perusing material we can share on one stage. It helps in enhancing economy of library and stays away from duplication of library buy.

- ✓ ***Collection Development:*** Cloud processing is utilized for gathering improvement. Duplications can be effortlessly maintained a strategic distance from and interchange assets can be found and made open to benefactors.

- ✓ ***File sharing***: To share different records in electronic shape turn out to be simple with the Cloud computing.

- ✓ ***Information Discovery***: Cloud gives a stage to store all data that one can get to at whatever time from anyplace; so data disclosure and seeking turn out to be simple and it is exceptionally valuable for scientists.

- ✓ ***E-Learning***: In the E-Learning environment as well, Cloud computing is aid. Concentrate material can be continued the cloud for reference reason and online examinations likewise can be directed. Examinations, modifications should be possible at once from better places.

- ✓ ***Information Literacy/Orientation***: Libraries can lead data education and introduction courses on the cloud. They can keep the instructional exercises, recordings, presentations and documents on the cloud for client's introduction.

- ✓ ***Social Interactions with the clients***: Can be conceivable as a result of Cloud computing.

9. Vital Role of Cloud Librarian:

- ✓ To track part data and exchanges

- ✓ To give Access Pin to understudies and characterize legitimacy. (Stick can be auto created; Validity can be set in the product)

- ✓ To speak with the part libraries contributing their assets to cloud for asset sharing

- ✓ To speak with the EBooks, Journals publishers& wholesalers, consortia, database suppliers

- ✓ To talk about with employees and subject specialists, custodians for get ready

diverse bundles for various resources and classes.

- ✓ To redesign mechanical abilities
- ✓ To give mechanical support to part libraries
- ✓ To direct preparing and mindfulness programs for pursuers
- ✓ To give interlibrary advance office
- ✓ To track use record of cloud assets
- ✓ To create advanced gathering
- ✓ To keep record of physical assets too to provide referral benefit
- ✓ To manage Cloud asset and players and select the best deal.
- ✓ To keep up possess virtual profile by making his or her blog or informal organization profile to associate with the client. A similar stage can be utilized for giving reference benefits and instructing the clients on cloud assets or how to utilize the Cloud foundation.
- ✓ To utilize his or her vital arranging and basic leadership capacity at various phases of building up a Cloud library.

10. Conclusion:

Cloud computing is an expression that is being utilized today to portray the demonstration of sharing information putting away, getting to, and, applications, and registering power in the internet. It supports libraries and their clients to partake in a system and group of libraries by empowering them to reuse data. The Cloud figuring systems and techniques connected to libraries, not just can enhance the nature of administrations and use of assets, libraries think genuinely to use of this best administrations. Clubbing libraries administrations with cloud based advances is given dependable and quick administrations to their clients

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CLOUD COMPUTING USE OF FIELD IN LIBRARY AND INFORMATION SCIENCE

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Abstract: In these times technological development has brought a dynamic change in various fields. So, library and information science is not exception to it. Information technology impacted positively on library and information system and services they provide for users. The libraries and information system have been automated, networked and now moving towards paper less or virtual libraries. To gather challenges in the profession librarians are also applying different platforms in Library science filed for attaining economy in information handling. This paper presence the concept of cloud computing a newly develop in area. The use of cloud computing in libraries and information field and how cloud computing actually works to explain in this communication.

Keywords: Cloud Computing; libraries; Cloud Models, Applications in Library Systems

1. INTRODUCTION:

Now a day we are living in the age of information. Information Technology (IT) is very vital role in field of library and information science i.e. Collection, Storage, Organization, Processing, Analysis and Transfer of information. The field of library facing many challenges in the profession due to applications of IT. The new ideas and concepts are being added to ease the practices in the libraries is also accepting various new technologies in the profession as they suit the present information handling and they satisfy needs of at present knowledge society. The TI advance, libraries have become which is the basic need towards followed by networks and more effort are virtual libraries. The emerge and growth of e- publication, internet usage, digital libraries web tools applications for libraries, consortium leads to the next development in LIS profession. The upgraded Technology trend in LIS in use of Cloud Computing for various purposes and for their achieving economy in library functions. The cloud computing is a new and core area the professionals should be aware of it also the application of cloud computing in LIS.

2. WHAT IS CLOUD COMPUTING?

Cloud computing is a new technology model for IT services which many organizations and individuals are adopting. Cloud computing can transform the way systems are built and services delivered, providing libraries with an opportunity to extend their impact. Cloud Computing is internet based computing where virtual shared servers provide software, infrastructure, platform devices and other resources and hosting to customers on a pay-as-you-use basis. All information that a digitized system has to offer is provided as a service in the cloud computing model. Users can access these services available on the "Internet Cloud" without having any previous know- how on managing the resources involved.

3. Definition of Cloud Computing:

Wikipedia define Cloud computing is a type of Internet-based computing that provides shared computer processing resources and data to computers and other devices on demand. According to National Institute of Standards and Technology (NIST) "Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction." We have lots of compute power and storage capabilities residing in the distributed environment of the cloud. What cloud computing does is to harness the capabilities of these resources and make available these resources as a single entity which can be changed to meet the current needs of the user. The basis of cloud computing is to create a set of virtual servers on the available vast resource pool and give it to the clients. Any web enabled device can be used to access the resources through the virtual servers. Based on the computing needs of the client, the infrastructure allotted to the client can be scaled up or down. One of the key concepts of cloud computing is that processing of 500 times The data need not be 500 times harder. As and when the amount of data increases, the Cloud computing services can be used to manage the load effectively and make the Processing tasks easier. In the era of enterprise servers and personal computers, Hardware was the commodity as the main criteria for the processing capabilities depended on the hardware configuration of the server.

4. Origin of the term Cloud computing:

The origin of the term cloud computing in computing is unclear. The word "cloud" is commonly used in science to describe a large agglomeration of objects that visually appear from a distance as a cloud and describes any set of things whose details are not further inspected in a given context. In analogy to the above usage, the word cloud was used as a metaphor for the Internet and a standardized cloud-like shape was used to denote a network on telephony schematics. Later it was used to depict the Internet in computer network diagrams. The cloud symbol was used to represent networks of computing equipment in the original ARPANET by as early as 1977 and the CSNET by 1981 both predecessors to the Internet itself.

In modern sense "Cloud computing" appeared as early as 1996, with the earliest known mention in a Compaq internal document The popularization of the term can be traced to 2006 when Amazon.com introduced its Elastic Compute Cloud. In July 2010, Rackspace Hosting and NASA jointly launched an open-source cloud-software initiative known as OpenStack. The OpenStack project intended to help organizations offering cloud-computing services running on standard hardware.

On June 7, 2012, Oracle announced the Oracle Cloud. While aspects of the Oracle Cloud are still in development, this cloud offering is poised to be the first to provide users with access to an integrated set of IT solutions, including the Applications (SaaS), Platform (PaaS), and Infrastructure (IaaS) layers.

5. Characteristics of Cloud computing:

Flexible: Agility for organizations may be improved, as cloud computing may increase users' flexibility with re-provisioning, adding, or expanding technological infrastructure resources

Self Healing: Any application or any service running in a cloud computing environment has the property of self healing. In case of failure of the application, there is always a hot backup of the application ready to take over without disruption. There are multiple copies of the same application - each copy updating itself regularly so that at times of failure there is at least one copy of the application which can take over without even the slightest change in its running state.

Cost reductions : Cost reductions are claimed by cloud providers. A public-cloud delivery model converts capital expenditure to operational expenditure. This purportedly lowers barriers to entry, as infrastructure is typically provided by a third party and need not be purchased for one-time or infrequent intensive computing tasks. Pricing on a utility computing basis is "fine-grained", with usage-based billing options. As well, less in-house IT skills are required for

implementation of projects that use cloud computing.

Multi-tenancy: With cloud computing, any application supports multi-tenancy - that is multiple tenants at the same instant of time. The system allows several customers to share the infrastructure allotted to them without any of them being aware of the sharing. This is done by virtualizing the servers on the available machine pool and then allotting the servers to multiple users. This is done in such a way that the privacy of the users or the security of their data is not compromised.

Performance: Performance is monitored by IT experts from the service provider, and consistent and loosely coupled architectures are constructed using web services as the system interface.

Linearly Scalable: Cloud computing services are linearly scalable. The system is able to break down the workloads into pieces and service it across the infrastructure. An exact idea of linear scalability can be obtained from the fact that if one server is able to process say 1000 transactions per second, then two servers can process 2000 transactions per second.

Service-oriented: Cloud computing systems are all service oriented - i.e. the systems are such that they are created out of other discrete services. Many such discrete services which are independent of each other are combined together to form this service. This allows re-use of the different services that are available and that are being created. Using the services that were just created, other such services can be created.

Reliability: Reliability improves with the use of multiple redundant sites, which makes well-designed cloud computing suitable for business continuity and disaster recovery.

Security: Security can improve due to centralization of data, increased security-focused resources, etc., but concerns can persist about loss of control over certain sensitive data, and the lack of security for stored kernels. Security is often as good as or better than other traditional systems.

6. TYPES OF CLOUD COMPUTING:

Cloud computing are four types:

- 1. Public cloud
- 2. Private cloud
- 3. Hybrid cloud
- 4. Community cloud

7. Public Cloud:

Public cloud sells service to any one on the internet. Amazon is one of the public cloud providers. Customer has no information about the location of the cloud. Infrastructures are shared between organizations.

8. Private Cloud:

It is different from public cloud because it provides data to limited number of people. Private clouds are expensive but it is considered more secure then public clouds.

9. Hybrid Cloud:

This is combination of public and private computers. it has qualities of both public clouding Private clouding. In this type of cloud sensitive data is stored in private cloud and other data is in public cloud.

10. Community cloud:

Community Cloud shares infrastructure between several organizations from a specific community with common concerns (security, compliance, jurisdiction, etc.), whether managed internally or by a third-party, and either hosted internally or externally. The costs are spread over fewer users than a public cloud (but more than a private cloud), so only some of the cost savings potential of cloud computing are realized.

11. SERVICES PROVIDED BY CLOUD COMPUTING

- **Infrastructure as a Service (IaaS):**
- This model provides the entire necessary infrastructure like computers, hard-disks, networks-storage, computing resources etc. to a company in the virtualized form. User can access the resources; run software"s & performs deployment without bothering about the management of Infrastructure. The service provider is solely responsible for the maintenance and management of equipments on-service.
- **Platform as a Service (PaaS):**
- This model provides a platform to run different applications. It could be considered as the most important model of cloud computing as it is intermediate between the IaaS & SaaS.

- **Software as a Service (SaaS):**
- This Model enables the use of different software applications by the end user over the internet. All the management & cost factors related to software like licensing, updates etc are handled by the service provider only.

12. Mobile "backend" as a service (MBaaS):

In the mobile "backend" as a service (mBaaS) model, also known as backend as a service (BaaS), web aap and mobile app developers are provided with a way to link their applications to cloud storage and cloud computing services with Application Programming Interfaces (APIs) exposed to their applications and custom Software Development Kits (SDKs). Services include user management, push notification, integration with social network service and more. This is a relatively recent model in cloud computing, with most BaaS startups dating from 2011 or later but trends indicate that these services are gaining significant mainstream traction with enterprise consumers.

Monitoring as a Service (MaaS):

Outsourcing of security service to a third party security team.

Communication as a Service (CaaS):

Allow for certain messaging tools viz voice over IP (VOIP), Instant Messages (IM) and Video Conferencing.

CLOUD SERVICES IN LIBRARYAND INFORMATION SYSTEM:

Library is the collection of different resources. The way new additions are made in the library, it is very difficult to manage everything with traditional management system. New technologies are available to manage & distribute the resources. Cloud computing uses the concept of centralizing the data on the internet further making it available to user, anytime anywhere. Virtualized shared resources allow multiple users to access the resources simultaneously. It reduces the dependency of installation, maintenance, failure of ICT infrastructure etc. Web repositories like E-journals & digital libraries etc are created so that users can access the global resources, helping the researchers/ educational professionals.

13. ADVANTAGES OF CLOUD COMPUTING IN LIBRARY SERVICE

Cost saving: Ability to increase or decrease the consumption of hardware or software resources immediately and in some cases automatically.

Scalability: "Pay as you go" allowing a more efficient control of expenditures.

Lower investment, reduced risk: Immediate access to the improvements in the resource proposed (hardware and software) and debugging.

Support included: Enjoyment of the most advanced security procedures, availability and performance of providers with experience and knowledge in this type of service.

Greater security and accessibility: Access to resources from any geographical point and the ability to test and evaluate resources at no cost.

Portability: since the service is available over the web, the service can be availed through browser from any part of the world.

Adjustable storage: In the traditional system, if the server is less than what we have. The server should be replaced with the new one. In this computing, the storage capacity can be adjusted according to the needs of the library, since the storage is controlled by the service provider.

Cloud OPAC: Most of the libraries in the world are having the catalogue over the web. These catalogues are available with their libraries local server made it available over the web. If the catalogue of the libraries made it available through cloud, it will be more benefit to the users to find out the availability of materials.

14. SOMES CLOUD COMPUTING OF LIS:

1. OCLC 2. Library of Congress (LC) 3. Exlibris 4. Polaris 5. Scribd

6. Discovery Service 7. Google Docs / Google Scholar 8. Worldcat 9. Encore

15. CONCLUSION:

Library and information science are moving towards cloud computing technology in present time and taking advantages of cloud based services especially in digital libraries, social networking and information communication. So, it is time for library and information think seriously for libraries and information services with

cloud based technologies and provide reliable and rapid services to their users. Another role of LIS professionals in this virtual era is to make cloud based services as a reliable medium to disseminate library and information services to their users with ease of use and save the time of users.

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CYBER SECURITY BEHAVIOUR PATTERNS AMONG POST GRADUATE STUDENTS - A CASE STUDY OF KARNATAKA STATE WOMEN'S UNIVERSITY, VIJAYAPURA

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Abstract: Information Technology (IT) has transformed the way we lead our lives. While rampant growth in the IT sector has opened up new arenas for development, along with it world is exposed to many loop holes. One of the major concerns is cyber or internet security. Cyber security has turned eyeballs all around the world due to the risks it poses. If cyber security is compromised, the risks include breach of national security, heavy economic losses, loss of personal information and identity theft. In this background there is a need to analyse the cyber security behaviour of youngsters, who are at the risk and many youngsters tend to practice risky behaviour online according to many research findings. Especially in rural areas where in the reach and knowledge on information security measures are low.

This study is an attempt to study the cyber security behaviour of the rural post graduate students of Karnataka State Women's University of Vijayapura. The research has been conducted in the background of preventive health care theory and survey method has been utilized. The study shows that female post graduate students exhibit negligence in making their online presence and work secure mainly due to lack of technical knowledge on preventive measures.

Keywords: Cyber security, Security behaviour patterns, post-graduates, survey

1. Introduction:

Information Technology (IT) has emerged as one of the most significant growth catalysts for the Indian economy. In addition to fuelling India's economy, this sector is also positively influencing the lives of its people through direct and indirect contribution to the various socio-economic parameters such as employment, standard of living and diversity among others. The sector has played a significant role in transforming India's image to that of a global player in providing world-class technology solutions and IT business services. In the light of the growth of IT sector in the country, ambitious plans for rapid social transformation and inclusive growth and India's prominent role in the IT global market, providing right kind of focus for creating secure computing environment and adequate trust and confidence in electronic transactions, software, services, devices and networks, has become one of the compelling priorities for the country. Such a focus enables creation of a suitable cyber security eco-system in the country, in tune with globally networked environment.

In 2016, India had 462,124,989 internet users, amounting to 34.8 percent of its population ("Internet Users by Country (2016) - Internet Live Stats", 2017), has also attracted malicious people who prey upon innocent victims online leading to security breach such as virus attacks, identity theft, salami, phishing, spam, fake accounts, cyber bullying etc.

Cyber or Internet security is one of the major concerns arising in the world today. Cyber space is a complex environment that can advance individuals' experience of electronic dependent activities, but can also place these individuals and their respective nations in a vulnerable state. Cyber space, cyber awareness and cyber security play an important role in the online experience of individuals, and need to be addressed accordingly. The internet and cyber world is a dangerous place where innocent users can inadvertently fall prey to shrewd cyber criminals (Grobler, Vuuren, & Zaaiman, 2011). When such is the environment of information super highway, there is a need for the end users to be conscious and aware of possible security risks and necessary precautions are must. The human must understand their role in the security processes and should have some form of training in this regard (Thomson & von Solms, 1998). Lack of security awareness among users is considered as the biggest obstacle in InfoSec (Tarwireyi, Flowerday, & Bayaga, 2011).In these circumstances, mainly rural masses lag behind as they have lower knowledge on info and cyber security compared to their urban counterparts. In order to bridge the gap between the urban and rural and to eradicate gender disparity in terms of technical knowledge, there is a need to analyze the security behaviour patterns of the rural women, especially youngsters who follow risky cyber behaviour and habits. While technological controls are necessary, computer security also depends on individual's security behaviour (Ng, Kankanhalli, & Xu, 2009). Once the behaviour patterns are known, it is a possible task to design a awareness programme which will help to fill in the knowledge gap. In this study, rural post graduate (PG) students of Karnataka State Women's University of Vijayapura, Karnataka were surveyed for the behaviour patterns as Vijayapura is one of the most backward districts of Karnataka and women are lagging far to behind.

2. Review of literature:

Boon-Yuen Ng, A. Kankanhalli and Y. Xu (2008) investigated the computer users' security behaviour. Their results show that perceived susceptibility, benefits and self-efficacy are crucial of email related security behaviour.

Steven Furnell, V. Tsaganidi and A. Phippen (2008) through their qualitative study of novice internet users reveal the existence of general awareness, but less familiarity with the appropriate safeguards beyond a very basic level due to lack of technical knowledge.

S. M. Furnell; P. Bryant and A. D. Phippen (2007) through their survey of home computer users assess user's perceptions and attitudes towards the security issues and reveal that although there is a high degree of confidence at a surface level with respondents claiming to be aware of the threats and utilizing many safeguards, but there are several areas in which desirable knowledge and understanding are lacking.

3. Statement of the problem:

To analyze the cyber security behaviour patterns of the rural post graduate students of Karnataka State Women's University of Vijayapura, Karnataka..

4. Objectives:

1. To find out the Cyber security behaviour of the PG students.
2. To know the perceived susceptibility by the PG students.
3. To know the perceived barriers to develop positive internet security habits
4. To know the perceived benefits of cyber security practices.
5. To know the general security orientation of the students.

5. Theoretical Perspective:

Preventive Health Care Theory has been utilized here to deconstruct the Internet Security Behaviour of the post-graduate students from the rural background. Preventive behaviour in the case of internet security refers to the set of behaviour that will lessen the risks, effects and impact of security breach online.

6. Methodology:

The study was conducted using the quantitative methodology of Survey. The respondents were selected using random sampling technique, consisting of 20 rural students each from five post graduate departments of Karnataka State Women's university, Vijayapura. Structured questionnaire on the cyber security.

Findings and Analysis:

Table 1: Respondents' Age

Categories	Respondents	Percentage
20 to 23	86	86%
24 to 26	14	14%
27 and above	0	0%
Total	**100**	**100%**

Table one gives the age groups of the PG students who were selected as the respondents. A great majority (86%) of the respondents belong to the age group of 20 to 23 years and less than one sixth (14%) of the respondents belong to the age group 24 to 26 years.

Table 2: Computer access points

Access Points	Yes	Percentage	No	Percentage
Home	15	15%	85	85%
University lab	100	100%	0	0%
Library	48	48%	52	52%
Friend's computer	10	10%	90	90%

According to table two, Cent percent of the respondents have access to computers at university labs. Nearly half (48%) of the respondents have access to computers at libraries, followed by at home (15%) and friends' computers (10%).

Table 3: Technical protection of Computers

Categories	Yes	Percentage	No	Percentage
Computer password protected	94	94%	6	6%
Anti-Virus Installation	92	92%	8	8%
Updating Anti-Virus	73	73%	27	27%

Table three gives the details about the technical protection applied by the respondents for security. A great majority (94%) of the respondents' computers are password protected. More than three fourth (92%) of the respondents have installed anti-virus software on their computers but only 73 percent of the respondents update anti-virus software regularly. Not updating the software can be seen as a risky behaviour and loop hole in internet security.

Table 4: Cyber Security Behavior of the PG Students

Categories	Agree	Percentage	Disagree	Percentage
Password Sharing	14	14%	86	86%
Password Changing	12	12%	98	98%
Checking of mail subject	72	72%	18	18%
Checking file name	89	89%	11	11%
Caution of virus in Mail	8	8%	92	92%
Open Suspicious Mail	25	25%	75	75%

Table five depicts the cyber security behaviours of the respondents towards come of the crucial aspects. The positive behaviour such as changing email password in regular intervals can only be seen in a meager 12 percent of the respondents, while checking subject of the email before opening and checking file name before downloading is practiced by 72 percent and 89 percent of the respondents respectively. Only 8 percent are cautious about infecting their computer with virus. Negative behaviours such as password sharing is practiced by 14 percent of the respondents and quarter (25%) of the respondents open suspicious emails despite concerns. These figures shows that many youngsters take part in careless cyber activity which might compromise the security of their computer and information.

Table 5: Perceived Susceptibility

Categories	Yes	Percentage	No	Percentage
Chances of email attachment with virus	82	82%	18	18%
Good Possibility of receiving email attachment with virus	88	88%	12	12%
Likely to receive email attachment with virus	79	79%	21	21%

The perceived susceptibility of the respondents is depicted in the table five. perceived susceptibility can be explained as how vulnerable do they think they are to security risks. A great majority (88%) of the respondents opine that there are chances of receiving virus through emails attachments, good possibility of receiving virus through emails attachments (82%) and believe that they are likely to receive virus through emails attachments (79%). As all the percentages fall in the last quarter, it can be concluded that the respondents do worry very much that

they might receive virus through emails.

Table 6: Perceived Benefits

Does checking these factors benefit	Agree	Percentage	Disagree	Percentage
The sender and subject of emails makes sense	83	83%	17	17%
Attachment name	87	87%	13	13%

According to table six, a great majority of the respondents (87%) that checking of sender and subject of the emails helps them in secure browsing, followed by checking the attachment name (83%). Respondents are of the opinion that exercising necessary caution while using internet is beneficial.

Table 7: Perceived Barriers

Exercising care while reading emails with attachment	Agree	Percentage	Disagree	Percentage
Is inconvenient	43	43%	57	57%
Is time consuming	25	25%	75	75%
Requiresextra effort	7	7%	93	93%
Requires starting new habit	5	5%	95	95%

Table seven depicts the perceived barriers to exercise care when using internet. Nearly half (43%) of the respondents opine that exercising care while reading emails and attachments is inconvenient and quarter (25%) of them express that exercising care is time consuming. It is worth nothing that a great majority (95%) of the respondents disagree that taking care requires starting a new habit and 93 percent of the respondents opine disagree that taking care requires extra effort. As per the findings inconvenience and time consumption seems to be the major road blocks in terms of being cautious online.

Table 8: General Security Orientation

Categories	Agree	Percentage	Disagree	Percentage
Reading information security bulletins or Pop-ups	11	11%	89	89%
Concerned about security	15	15%	85	85%
Interested in information about computer security	72	72%	28	28%
Constantly mindful about computer security	23	23%	77	77%

Table eight gives the insight into the general security orientation of the respondents. Though majority (72%) of the respondents are interested in information about computer security, only 15 percent of the respondents are concerned about security, a mere 11 percent read information security related bulletins or pop-ups. Neglecting the pop-ups seems to be the trend followed, as the respondents lack sufficient knowledge on cyber and information security and only 23 percent of the respondents are constantly mindful about computer security.

7. Conclusion:

New age technology has been a boon and a curse. While offering umpteen number of opportunities and possibilities across varied arenas, it is vulnerable to security breach, from something like virus, cyber bullying to higher risks such as banking scams, identity theft and national security risk. Despite highly efficient firewalls no data seems to be protected at all the times.

With today's youngsters increasingly becoming more dependent on technology , there is an immediate need to make them aware of the cyber security risks they can fall victim to. A great majority (94%) of the respondents' computers are password protected. More than three fourth (92%) of the respondents have installed anti-virus software on their computers, updating anti-virus seems to be the last issue on their mind as they do not that updating is necessary. While positive behaviours such as changing email password in regular intervals can only be seen in a meager 12 percent of the respondents, while checking subject of the email before opening and checking file name before downloading is practiced by 72 percent and 89 percent of the respondents respectively. The disturbing fact is that quarter of the students open suspicious emails.

Perceived susceptibility was surveyed to know how the students can be influenced to change their risky behaviour. A great majority (88%) of the respondents opine that there are chances of receiving virus through emails attachments, good possibility of receiving virus through emails attachments (82%) and believe that they are likely to receive virus through emails attachments (79%). Higher the degree of susceptibility, higher the chances that if necessary interventions are taken the respondents will change for better. It is also helpful that majority of the respondents are of the opinion that exercising necessary caution while using internet is beneficial. The major obstacle for exercising caution seems to be psychological block, inconvenience and time consumption and lack of knowledge on repercussion as respondents are of the opinion that

exercising necessary caution while using internet is beneficial. By analyzing the cyber security behaviour of the rural PG female students, who seem to be more vulnerable due to lack of knowledge, gender and access disparity, a comprehensive awareness programme on Cyber Security.

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Enhancing Moodle Open Source Online Learning Management System In Higher Education

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Abstract: The main purpose of present study how moodle enhancing online education in our study . Online education always pushing to Enhance to help students achieve the goals. In this paper we show how Moodle can be use to improve the quality of higher education environment and, even more important, how can be use to turn the educational system more sustainable and effective in the long-term. Enhancing Higher education Moodle, you can easily upload and share resources, videos, articles, pictures, and anything else students might need to complete coursework and assignments. Having a centralized repository means that teachers students can easily access their learning materials whenever they need, as many times as they need. Today lots of student they cannot attend the classes in regularly that's students can use online learning courses.

Keywords: Education, Open source, LMS, Moodle,

1. Introduction

Nowadays, education is lifelong learning process; the computer is a significant part of the learner's daily life. Today we have various emerging technologies which Enhance our lives in different ways. Internet is more important of our day today days. Online-learning plays a significant role in education and its importance increases day by day. Online Learning system change in many aspects of teaching and learning: course design, teacher–student interaction, delivery methods, design of student tasks and assessment and many higher education institutes starting to share their courses online for free.

Creating course materials and Enhancing them into a self-contained format can be a time consuming task.(Garcia et al., 2012). Online education is the process of facilitating teaching learning, or the acquisition of knowledge, skills, beliefs, values, and habits. Educational methods include storytelling, teaching, training, discussion, and directed students. Education frequently takes place under the guidance of educators, but learners may also educate themselves. Education can take place in formal or informal settings and any experience that has a formative effect on the way one feels, thinks, or acts may be considered educational. To make meaningful information is necessary to take advantage of the interactive multimedia applications. It is stated that a lot of research, teaching learning methods that increase the motivation of students

and courses appeal to different senses can have a positive impact on student learning in arts education.(Erol, 2015). Moodle is used by educational institutions like schools colleges & universities, to deliver courses on the Web and networks. **Moodle** e-Learning management allows teachers to act as facilitators of learning and to provide a framework for direct and online interaction that can take place inside & outside the classroom.("Moodle e-Learning," n.d.)

2. Moodle :Open Source Online Learning Management System

Today Moodle is a free and open-source software learning management system written in PHP and distributed under the GNU General Public License. With customizable management features, it is used to create private websites with online courses for educators and students trainers to achieve learning goals. Modular object-oriented dynamic learning environment was originally developed by Martin Dougiamas to help educators create courses with a focus on interaction and collaborative construction of content and courses to student and teachers, and it is in continual evolution. The first version of Moodle was released on 20 August 2002. The most recent long-term support release (LTS) version is Moodle 3.0.6 12 September 2016.

In order to aid the various higher educational institutes or organization in spreading knowledge and information as well as in interacting and collaborative with the students. These are certain tools which provide extensive course management options and are known as Learning Management Systems. There are various such software tools available in the market moodle which plays a very significant role in the spread of online education thus aiding the students in attaining the online degree and courses.

Moodle is a free software, a learning management system Enhancing a platform for e-learning and it helps the various educators considerably in conceptualizing the various courses, course design course structures and curriculum thus facilitating interaction with online students. Moodle actually stands for Modular Object-Oriented Dynamic Learning Environment and online statistics reveal that about 14 million consumers are engaged in about 1.4 million courses propagated by this learning management system.("MOODLE - Online Learning - DistanceLearningPortal.com," n.d.)

3. Moodle and Online Learning users

Moodle Online learning offers students easier access to education, as well as a more personalized, flexible, and customized learning experience, which explains its increasing popularity among a cross section of students including working professionals interest in lifelong learning educatuion.("elearn Magazine: The Future of Online Learning," n.d.) Today rapid increase in internet connecti vity has been an important catalyst for the growth of online learning. The story

is not limited to schools alone college Universities. Indian are adopting e-learning platforms as continuous students learning has become a strategic necessity. With the number of internet users in India expected to reach 250 million, rivalling the US and second only to China, India's potential as a huge market for e-learning. A large number of new users are accessing the internet for the first time from their smartphones, which is an ideal, personalised and commerce-enabled platform for e-learning Enhancing.

Universities will see more students accessing their coursework from outside the traditional classroom. As per the Docebo report issued in July 2014, the worldwide market for self-paced e-learning reached $35.6 billion in 2011. The five-year CAGR is estimated to be 7.6%, so revenues should reach $51.5 billion by 2016. While the aggregate growth rate is 7.6%, several world regions have higher growth rates. The highest rate is in Asia at 17.3%, followed by Eastern Europe (16.9%), Africa (15.2%) and Latin America (14.6%) online.

According to another report, India's online education market size is set to grow to $40 billion by 2017 from the current $20 billion. India has one of the largest education systems in the world with a network of more than 1 million schools and 18,000 higher education institutions. More than half of the country's 1.2 billion population falls in the target market for education and related services.("Why e-learning has a promising future in India - The Financial Express," n.d.)

India is the third largest online learning market with 1.3 million learners after the US and China, says a recent analysis of online learning website Coursera. The data reveals that an increasing interest in flexible, career-relevant online courses has resulted in a considerable spike in new registrations in India of 70 percent over the past one year. Bengaluru emerged as the top city in India for online learning with the highest number of registered learners, followed by Delhi, Mumbai, Chennai and Hyderabad("Bengaluru tops the chart of online learning in India: Coursera | The Indian Express," n.d.).

The table 1 shows the moodle statistics tells us By 5 October 2016 2016 number of user registered moodle sites 71,594 Countries 232 Courses 10,817,955 Users 93,759,557 Enrolments 302,496,662 Forum posts 191,060,069 Resources 97,004,167 Quiz questions 506,945,106 The table 2 shows the Top 10 countries by registrations Country Registrations United States 10,284 Spain 6,887 Brazil 4,365 United Kingdom 3,500 Mexico 3,354 Germany 2,388 Australia 2,277 Italy 2,248 Colombia 2,216 India 1,910

Moodle Statistics	
Registered sites	71,594
Countries	232
Courses	10,817,955
Users	93,759,557
Enrolments	302,496,662
Forum posts	191,060,069
Resources	97,004,167
Quiz questions	506,945,106



Top 10 countries by registrations	
Country	**Registrations**
United States	10,284
Spain	6,887
Brazil	4,365
United Kingdom	3,500
Mexico	3,354
Germany	2,388
Australia	2,277
Italy	2,248
Colombia	2,216
India	1,910

Top 10 from registered sites in 232 countries

4. Features of Moodle Open Source Learning Management System

Moodle is an Open Source Learning Management System (LMS) developed in PHP. It has become very popular among educators around the world as a tool for creating online dynamic courses for their students. Its applications are not only limited to schools and institutions but it can be easily customized and configured for corporate/ internal training also. We can easily add large set of plug-ins other than its pre-defined features. The following are some of the features in general. The list is exhaustive but not limited to these only;

Some typical features of Moodle are:

- Discussion forum
- Assignment submission
- Files download
- Grading
- Moodle instant messages
- Online calendar
- Online news and announcement
- Wiki
- Online quiz

a) Freely Available: Online learning you don't have to pay annual subscription payment or renewal charges to software companies. e.g. Everyone has to pay Microsoft for Windows and Ms-Office.

b) Greater Flexibility: Moodle Open source products are customizable according to the need. New features and tools can be imported from the open source community whenever need arise.

c) Free Service: Learning the huge collaborative network of the open source community minimizes the risk, although it does not eliminate, the risk of discontinued service. Volunteers help is available through open source support systems such as forums.

d) Continuous Enhancement/Upgrade: Extensive collaboration ensures the upgrades in the software products. Programmers from different institutions and organizations, along with volunteers, contribute freely to projects.

e) Tax benefits: Governments of many countries have implemented tax-exemption policies to boost open source projects. In India for educational purchase octroi charges are waved on some conditions.

f) Online Documentation: All help and documentation required to use and run the

open source software is available on the respective software's site. (Barge & Londhe, 2014)

BlueApple has 4 years of considerable experience on Moodle which includes designing Learning Management System for education & training institutes locally and internationally and customizing for the corporate sector as well. ("Moodle Development Company in India, Hire Moodle developer," n.d.)

5. Moodle Enhance Of Higher Education

Moodle can help teachers save time in many activities especially on the assessment of students. The time spent by teachers on preparing course, coursework course design especially in large classes can be reduced significantly by making use of the system where important assessment activities can be done automatically by the system when students interact with it.(Ngeze, 2016) Online learning platforms like Moodle LMS are ideal for students in Enhancing higher education. Here are 5 ways that Moodle Enhances Utilization and enhances higher education.

- Moodle is online learning is steady stream of communication is essential for students in higher education, because it increases both learner engagement and student success. Moodle has a number of plugins and modules that can be used for this purpose. The forum module allows virtual communication in Moodle between students and teachers. There are two different forms of messaging in Moodle - instant messaging and message alerts, that provide quick and efficient ways to get in touch with peers and teachers. There are also Moodle blogs (each Moodle user has their own), that can be used to share and express thoughts. The great thing about Moodle is that you can access it at your own time, so you don't have to worry about being constantly preoccupied with discussions and questions, you can go on when you have time.

- Along those same lines, Moodle enables and encourages collaboration and teamwork - the communication features in Moodle listed above (discussions, forums, messaging) allow students to work together, share ideas, and ask/answer questions if needed. Collaboration nurtures success, because it allows students to work through their problems, and fine-tune their work with the help of their peers.

- In higher education, course materials and supplementary resources are just as essential as in-class lectures. In Moodle, you can easily upload and share resources, articles, videos, pictures, and anything else students might need to complete coursework and assignments. Having a centralized repository means

that students can easily access their learning materials whenever they need, as many times as they need.

- In Moodle, assignment submissions are not only limited to school hours - you can submit assignments in Moodle at any designated time, including weekends, early mornings, and evenings. This not only provides students with more time to fine-tune their work, it also alleviates some of the stress associated with getting work into teachers' hands in time.

- Moodle heartily accommodates flexible learning on the go. Moodle offers mobile eLearning, as it is compatible across a number devices, including smartphones, tablets, and laptops. Not only can you complete coursework and access course materials from home, you can also do so on the bus, at work, on a coffee break, or from anywhere you have internet access. The limitations are few, and the possibilities are endless! ("5 Ways Moodle Enhances Higher Education," n.d.)

6. Moodle LMS Benefits for Education Sector

Moodle LMS optimizes instructional delivery and administration, empowering teachers to devote more time to quality student interaction, research and self-improvement. It empowers students to learn better and faster as many academic processes become more efficient. Effective Moodle LMS usage leads to better academic quality, discipline and economy:

- Continuous availability to students of lectures, instructional content and other study material
- Reusability and rapid updating of lectures, study material, assessment etc.
- Streamlined management of timetables, classes, assignments, homework and projects
- Streamlined management of assessment, grading, exams
- Efficient, trackable communication and collaboration
- Reports, analytics enable rapid corrective measures
- Substantial savings from reduced expense on stationery, copiers / scanners and even transport and logistical facilities

Assistance in designing / adapting processes to make the best use of Moodle's features. Assistance in converting instructor delivered face-to-face teaching into effective blended learning courses.("For Education Sector | Ballistic Learning," n.d.)

7. Conclusion

The use of Moodle Learning Management Systems in teaching and learning is of great importance to both students and teachers. Moodle can help teachers save time in many activities especially on the assessment of students. The time spent by teachers on preparing course, coursework especially in large classes can be reduced significantly by making use of the system where important assessment activities can be done automatically by the system when students interact with it. Higher education is undergoing an explosive period of transformation that embraces the digital age. From tablets to smart phones to wikis and blogs, today's digital environment makes communication, collaboration and information sharing easier than ever before. Teaching and learning now occurs on a multi-dimensional level that involves both personal instruction and cutting-edge online technologies. This paradigm shift has made advanced education considerably more accessible to current and potential students, driving increased demand for online learning opportunities.

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Impact of Electronic Publishing on Collection Development in Libraries

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Abstract: Economic forces and technological advances have combined together to create a new environment, which is popularly known as 'Electronic' environment. Where access to collective scholarly resources that no library could ever afford, supersedes the historic quest for the great comprehensive collection. This article describes briefly the impact of Electronic publishing on collection development in libraries. Discusses about the selection criteria, pricing issues and models for different electronic formats and enlist the challenges before library professionals in the changed context.

Keywords: Electronic Publishing, Collection Development, Collection Development Policy, Electronic Information Resources and Pricing Models.

1. INTRODUCTION

Libraries have always been dependent on developments in the publishing industry and in scholarly research and communication. Changes in this industry have a direct impact on the information systems and services. Technology has altered the mode of publication in such a way that though the traditional sources of information continues to be produced; by and large information market has been flooded with the attractive electronic form of publications. Care must be taken that these alternatives to library are not glorified as able to perform information services are limited or bound by any traditions. The library must take initiatives to take a lead in the exploitation of electronic information sources, at the same time acknowledging the problems in doing so.

Electronic sources present the following problems:

- Integrating them with more traditional forms,
- Costs of acquisition versus access

- Determining what 'collection development' really means in the electronic environment.

The role of collection development in dealing with distributed electronic sources may be little different from the print-on-paper world. This perhaps raises the biggest question of all as to what does the future hold for collection development. This needs to be speculated based on the trends in this specially. The most important stage regarding the evolution of electronic publishing is from the early 1960s to the present and to be continued into the future. This has an impact on creators (authors), producers, distributors, intermediate users (library & information centres) and end-users. This article concerns with its impact on the intermediate users.

In the 1960s, the electronic distribution of information sources had a limited impact because it largely took the form of distribution via magnetic tapes for use on large mainframe computers. The impact increased dramatically in the 1970s as online networks came into being and continued to increase as the network expanded, costs reduced and the volume of resources available on online multiplied. In the 1980s, various forms of electronic publishing were available and accessible via conventional computer networks or television while others could be distributed in tapes and discs including CD-ROMs. By 1990s, satellite and telecommunication has widened the scope of electronic information access.

2. Definition

Kist (1989) defined electronic publishing as "the application by publishers of a computer aided process, by which they find, capture, shape, store and update information content in order to disseminate it to a chosen audience"

From Wikipedia, the free encyclopaedia, electronic publishing includes the digital publication of e-books and electronic articles, and the development of digital libraries and catalogues.

1) Electronic Publishing

It is basically a form of publishing in which books, journals and magazines are being produced and stored electronically rather than in print. These publications have all qualities of the normal publishing like the use of colours, graphics and images and they are much convenient also. It is the process for production of typeset quality documents containing text, graphics, pictures, tables, equations etc. it is used to define the production of any that is digitized form.

Electronic Publishing = Electronic Technology + Computer Technology + Communi-

cation Technology + Publishing

2) **Why Electronic Collection**

As the civilization moves ahead the ways of living and learning changes and at present the learning society prefers electronic access of documents as it proved itself to be the quickest method of access of information in comparison to other traditional methods, the updating is easy for the producers and similarly beneficial to users.

Electronic collection seems to be better than print one, as it requires no physical space as it is virtually present, one can access it anywhere any time provided he/she have required facilities, the updating is easier than print version, can be copied easily, can be accessed by more than one user at the same time which is not possible in print collection, the font of the content can be adjusted according to the test of user, maintenance and technical processing of document costs comparatively nil to the print one and many more reasons which can prove that electronic collection is better than print one.

3) The impact of information and communication technologies

Developments in the field of information and communication technology since the 1960s have had a dramatic impact on library collection development and management at every level. Lynch (2000) charted the shift in library use of technology since the 1960s, describing an initial period of modernization, driven by automation of routine library processes, followed by innovation and experimentation – particularly in user access to electronic information and finally a stage of transformation represented by digitization and greater access to born digital content. Corrall (2012) expands on the framework proposed by Lynch (2000), elaborating four major phases in the development of digital technologies and their corresponding effects on collection development.

The impact of digital technology on collection development

Date	Digital Technology developments	Collection development issues
late 1960s–1970s	Modernization: automation, computer-based operations	library housekeeping, bibliographic utilities, COM catalogues, retrospective conversion, microform masters, self-renewing/no-growth library

1980s– early 1990s	Innovation: experimentation, computer-based services	library management, Conspectus methodology, OPACs, access versus holdings/ownership, end-user searching, just-in-time information
late 1980s–1990s	Transition: digitization, computer-based content	Integrated Systems, licensing consortia, full-text databases, multimedia products, resource discovery, virtual/digital/hybrid library
2000s–	Transformation: collaboration, network-based collections	ERM systems, federated search, open access, institutional repositories, digital asset management, data creation

4) E- Publishing and Acquisition

Libraries are in the middle of a move from having collections to having connections. This move is not fully completed. We still have some printed journals, and books are still to a large extent acquired in print. However, the end of this period is in sight. With the development of reading devices, for the downloading of electronic books, we are approaching the end of the Gutenberg era.

This development is an immense improvement of services. It is convenient and it reduces transactions costs to subscribe to packages of journal and book databases. The main problem is that the supplier decides what is in the package, and he may not be interested in including "bestsellers" or even very infrequently used material. The result is that the library may not be able to present to its users the very best literature or the most specialised literature on a subject. The library may become a distributor of mainstream products.

5) Impact of Electronic Publishing on Library Collection

Electronic publishing refers to the use of computer technology in publishing or distributing information. The impact of electronic publishing (e-publishing) on library collections, services and administration is complex. There are no simple solutions to the problems of managing the collection, archiving and access to e-publications, as well as their use in library services.

Some of the advantages to libraries and their users in solving these problems and using the solutions in providing library services are:

i. Access is increased for more users to more publications than individual libraries can acquire and store.

ii. Collection Development and co-operative collecting are simplified because libraries can share central storage and retrieval facilities.

iii. Preservation is made easier because of the relative case of duplication and archiving of electronic publications.

iv. There are wonderful opportunities also for libraries to do their own e-publishing through the Internet services such as e-mail and World Wide Web.

The products of electronic publishing are mainly reference materials, secondary sources such as abstracting and indexing sources and the primary periodicals such as full-text electronic journals, are slowly replacing the print on-paper sources.

3. Modes of Electronic Publishing and Collection Development

Since the application of Information Technology (IT) in publishing, the world seems to have exploded with digital products and its remote distribution. Undoubtedly all of this has had important implications for the way business, publishers, users get access to information essential form them. Different modes of electronic publishing (that is simultaneous digital version of print, digitized or born digital, either offline or online) are concurrently operational in the current market place. Attempts have been made to build up ER generated by different modes of electronic publishing. UNESCO, as early as in 1996, stated that "the development of new carriers for the storage of information, traditionally produced on paper, has brought about fundamental change in thinking within national libraries about future collection policies and storage requirements and an awareness that in order to maintain comprehensive collection of national publications for present and future generations of users, it will be necessary to obtain an increasing amount of non-print materials".

4. Types of E Publishing Models

a) Electronic Books (E-Books)

The book is quiet popular document to meet the academic needs of user community. Publishing a book electronically is to achieve quick publishing and dissemination of information. A book may not have contemporary value that a journal has but it certainly has an archival and reference value. A number of encyclopaedias do come out on CD-ROM. It is felt that the Internet is not a satisfactory platform for publishing full text of documents but CD-ROM is appropriate medium for publishing books. Book length e-text is also available on Floppy disc and CD-ROM, although distribution by floppy disc is decreasing due to the convenience

and growing popularity of CD-Rom. Most e-Texts published on CD-ROM are public domain works including encyclopaedias. Using the E-publishing language on Internet like SGML presented and published attractively with multimedia effect especially for documents like Yearbooks, Encyclopaedias.

b) Electronic Periodicals

Electronic Periodicals are accessible to all users regardless of geographic location. Anyone in the world with services and the proper computer software and browser services can access online journals. This accessibility leads to a more diverse audience throughout the world as well as a readership that may include not only academics, but students and lay people. This new media is a vehicle of scientific communication and purely a product of scientific research. This category includes electronic journals, newsletters, magazines, and discussion lists. Perhaps no other area in E-publishing has received more study than the area of E-journals. As they apply to scholarly research, are very useful source of information for Academic Library System.

c) Electronic Database

With the emergence of computers and communication technologies the strength of academic information system in the development of modern database has taken new shape. The holding of the academic libraries limitations. Database consisting of books, periodicals, reports and these can be converted to electronic form that allows access for public use through digital networks. The online electronic library card catalogue (OPAC) shows how information could be published and that enable user to search the document with various access points like author, title, subjects. Various electronic databases publishers today account for publishing information both bibliographic and full text on CD-ROMs as well as making them available for online retrieval. The prominent online publishers include DIALOG, BRS, and EBSCO host etc. An excellent example of electronically published databases, the ERIC (Educational Resource Information Centre) database is the largest educational database in the world that contains more than 800,000 records per year. ERIC is available in CD-ROM format as well as on the net free of charge.

d) Electronic Publishing on CD-ROM

CD-ROM has provided new dimension for information storage and retrieval. Publishing information mainly abstracting sources are quiet common in CD-ROM. Although much of the work on e-journals has concentrated on distribution via the Internet, there has been some work on CD-ROM as well. The advantages of CD-

Rom are:

1. More material can be included, both in terms of quantity (650+megabytes) and type (multi-media resources).

2. Full text searching is relatively easy to include.

e) Print-on-Demand (POD)

Print-on-Demand is a new method for printing books. It is a mix of electronic and print publishing. The book is held by the publisher in electronic form and is printed out in the hard copy form only on order. This method helps free publishers from the process of doing a traditional print run of several thousand books at a time. The technology involves complex laser printing systems and electronically formatted text that the printers can read. POD is very hot right now; in a sense, it is a good intermediary step between the regular method of printing paper books and electronic books. However, because POD is still a method that uses paper and cannot be delivered as cheaply and quickly as electronic books, in the long run, POD could decline in popularity when consumers become comfortable with electronic reading software and e book reading devices.

f) Digital Content

Digital delivery of fiction that is shorter than book-length, nonfiction, and other written works of shorter length. Publishers of digital content deliver shorter sized works to the consumer via download to handheld and other wireless devices. Technology used for delivering digital content includes Adobe PDF, XML, HDML, WAP (Wireless Application Protocol) and other technologies. The security of the data being delivered is the major concern of publishers who want to ensure they can deliver digital content without the risk of someone copying the work and selling or giving away the works.

g) Electronic Ink

Electronic Ink is a developing technology that could have a huge impact on the media and publishing industries. Electronic Ink could be used to create a newspaper or book that updates itself. In addition, this content could be programmed to change at any time. For example, you could have a billboard that rotates different ads, or you could receive a coupon in the mail that is frequently updated with the latest offer. For media companies, the possibilities are almost endless. Someday your electronic newspaper will simply update itself every day. E- Ink Corporation, a new company with major investors, and Xerox are two companies currently developing this technology.

h) Email Publishing

Email publishing is designed specifically for delivering regular content-based email messages. Email publishing, or newsletter publishing, is a popular choice among readers who enjoy the ease of receiving news items, articles and short newsletters in their email box. The ease of delivery and production of email newsletters has led to the development of a massive number of available email newsletters, mailing lists and discussion lists on a large variety of topics. Newsletters are also widely used by media companies to complement their web and print offerings. Many authors and writers publish their own newsletters in order to attract new readers and to inform their fans about new books and book signings.

i) Web Publishing

Web publishing is not a novel practice any longer, but it continues to change and develop with the introduction of new programming languages. HTML is still the most widely used web programming language, but XML is also making headway. XML is valuable because it allows publishers to create content and data that is portable to other devices. Nearly every company in the world has some type of website, and content generally refers to the electronic most media companies provide a large amount of web based content.

5. Advantages of Electronic publishing and Digital Library

The advantages of digital libraries as a means of easily and rapidly accessing books, archives and images of various types are now widely recognized by commercial interests and public bodies alike Traditional libraries are limited by storage space; digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain it. As such, the cost of maintaining a digital library is much lower than that of a traditional library. A traditional library must spend large sums of money paying for staff, book maintenance, rent, and additional books.

Digital libraries may reduce or, in some instances, do away with these fees. Both types of library require cataloguing input to allow users to locate and retrieve material. Digital libraries may be more willing to adopt innovations in technology providing users with improvements in electronic and audio book technology as well as presenting new forms of communication conventional libraries may consider that providing online access to their OPAC catalogue is sufficient. An important advantage to digital conversion is increased accessibility to users.

Electronic publishing is increasingly popular in works of fiction as well as with scientific articles. Electronic publishers are able to provide quick gratification for late-night readers, books that customers might not be able to find in standard book retailers (erotica is especially popular in e-Book format), and books by new authors that would be unlikely to be profitable for traditional publishers.

6. Conclusion

The 21st Century librarian will basically become a resource sharing librarian, whose resources will have no boundaries, local, national or international. The services, the librarian can offer to the users, will compel them to create new methods of classifying and cataloguing internal resources, developing such type of search engine, which specialize in certain subject areas only and interlink each bit of information which has relevance to anything else in the universe of knowledge. In this changing scenario, the librarian is going to be a highly skilled professional whose total commitment would be as navigators to global intellectual resources as facilitators, instructors, gatekeepers of knowledge interpreters, evaluators, consultants, researchers, information managers, promoters and has improved the image of the librarians by playing all the roles successfully.

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INDIA SHIFTING TOWARDS DIGITIZATION: CLOUD COMPUTING AND LIBRARIES

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Abstract: Cloud computing has become a major topic of discussion and debate for any business or education organization which relies on technology. Cloud computing can transform the way system are built and services delivered, providing libraries with an opportunity to extend their impact. The paper presents an overview of cloud computing as to how anyone connected to the Internet is using some type of cloud computing on a regular basis whether they are using Google's Gmail, organizing photos on Flicker or searching the web with Bing, they are engaged in cloud computing. Digital Library also can relate to cloud computing. Digital Libraries are not just about converting print into digital. It has become more personalized considering various aspects such as search interface, single search, layered architecture, design system and preservation issues. How Cloud Computing solutions could be beneficial to libraries in technology, data and community or user.

Key Word: Cloud Computing; web-based application; library technology; Cloud for Industries; Digital Library.

1. INTRODUCTION

In present times, India is shifting towards digitization and generating large number of job opportunities and virtual paths to use their services for the various purpose. At present, Cloud computing has emerged as one of the most popular virtual technology for libraries to deliver the services in an effective and cost saving manner. Over the last few years' business have started to see the value of cloud computing causing it to become a major technology solution for business and various organizations around the world. Amazon Web Service (AWS), Flip Cart, and many more are the best examples of Cloud computing. Cloud computing provides a simple way to access servers, storage, databases and a broad set of application services over the Internet. A Cloud services platform such as Amazon Web Services owns and maintains the network-connected hardware required for these application services, while we provision and use what we need via a web application.

2. What is Cloud Computing?

Cloud computing is the on-demand delivery of compute power, database storage, applications, and other IT resources through a cloud services platform via the internet

with pay-as-you-go pricing. Whether you are running applications that share photos to millions of mobile users or you're supporting the critical operations of your business, a cloud services platform provides rapid access to flexible and low cost IT resources. With cloud computing, you don't need to make large upfront investments in hardware and spend a lot of time on the heavy lifting of managing that hardware. Instead, you can provision exactly the right type and size of computing resources you need to power your newest bright idea or operate your IT department. You can access as many resources as you need, almost instantly, and only pay for what you use.

The U.S. National Institute of Standards and Technology (NIST) defines Cloud Computing as "Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

NIST further identifies five essential characteristics, three service models, and four deployment models of Cloud computing.

3. Essential Characteristics

On-demand self-service: A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service provider.

Broad network access: Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations).

Resource pooling: The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned per consumer demand. There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or datacenter). Examples of resources include storage, processing, memory, and network bandwidth.

Rapid elasticity: Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand. To

the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time.

Measured service: Cloud systems automatically control and optimize resource use by leveraging a metering capability1 at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service.

4. Types of Cloud Computing

Cloud computing is providing developers and IT departments with the ability to focus on what matters must and avoid undifferentiated work like procurement, maintenance, and capacity planning. As cloud computing, has grown in popularity, several different models and deployment strategies have emerged to help meet specific needs of different users. Each type of cloud service, and deployment method, provides you with different levels of control, flexibility, and management. Understanding the differences between Infrastructure as a Service, Platform as a Service, and Software as a Service, as well as what deployment strategies you can use, can help you decide what set of services is right for your needs.

5. Cloud Computing Models

There are three main models for cloud computing. Each model represents a different part of the cloud computing stack.

6. Infrastructure as a Service (IaaS):

Infrastructure as a Service, sometimes abbreviated as IaaS, contains the basic building blocks for cloud IT and typically provide access to networking features, computers (virtual or on dedicated hardware), and data storage space. Infrastructure as a Service provides you with the highest level of flexibility and management control over your IT resources and is most like existing IT resources that many IT departments and developers are familiar with today.

7. Platform as a Service (PaaS):

Platforms as a service remove the need for organizations to manage the underlying

infrastructure (usually hardware and operating systems) and allow you to focus on the deployment and management of your applications. This helps you be more efficient as you don't need to worry about resource procurement, capacity planning, software maintenance, patching, or any of the other undifferentiated heavy lifting involved in running your application.

8. Software as a Service (SaaS):

Software as a Service provides you with a completed product that is run and managed by the service provider. In most cases, people referring to Software as a Service are referring to end-user applications. With a SaaS offering you do not have to think about how the service is maintained or how the underlying infrastructure is managed; you only need to think about how you will use that piece software. A common example of a SaaS application is web-based email where you can send and receive email without having to manage feature additions to the email product or maintaining the servers and operating systems that the email program is running on.

9. Deployment Models

Private cloud:

The cloud infrastructure is provisioned for exclusive use by a single organization comprising multiple consumers (e.g., business units). It may be owned, managed, and operated by the organization, a third party, or some combination of them, and it may exist on or off premises. **Community cloud**: The cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be owned, managed, and operated by one or more of the organizations in the community, a third party, or some combination of them, and it may exist on or off premises.

Public cloud: The cloud infrastructure is provisioned for open use by the public. It may be owned, managed, and operated by a business, academic, or government organization, or some combination of them. It exists on the premises of the cloud provider.

Hybrid cloud: The cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community, or public) that remain unique entities, but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds).

10. Advantages and Benefits of Cloud Computing in Libraries

For much of the past 25 years, software development and system engineering have centered primarily on the personal computer. With cloud computing, hardware and functionality traditionally installed and run in local environment is now performed on the network, in the Internet Could. Using of cloud computing the variable cost is lower than we get information or use of resources on your own.

Libraries have been using some cloud computing services for over a decade. Online database is accessed as cloud applications. Large Union Catalogues can also be defined as cloud applications. However, a look outside libraries is warranted to better understand the value proposition of cloud computing. The Library community can apply the concept of cloud computing to amplify the power of cooperation and build a significant unified presence on the web. The cloud computing can help libraries save time and money while simplifying workflows.

Libraries have many potential areas of improvement where cloud computing could help:

- Most library computer system are built on pre-web technology. They are using different software etc.
- Systems distributed across the Net using pre-web Technology are harder and costlier to integrate
- Libraries store and maintain much of the same data hundreds of times.
- Collaboration between libraries.
- Information seekers work in common Web environments and distributed systems make it difficult to get the library into their workflows.
- Combining systems into a cloud environment reduces the carbon footprints, making libraries greener.

These improvements can be grouped into three basis areas: technology, Data and Community/User.

In the present situation, every library needs a digital library to make their resources, information and services at an efficient level to ensure access via the Network. In connection to cloud based digital library software:

- Duraspace: is an independent 501(c)(3) not-for-profit organization providing leadership and innovation for open technologies that promote durable, persistent access to digital data. They collaborate with academic, scientific, cultural, and technology communities by supporting projects and creating services to help ensure that current and future generations have access to our collective digital heritage. Duraspace -supported open

technology projects provide long-term, durable access to and discovery of digital assets. They are having two software namely: Dspace and Fedora and now VIVO (since 2014) are directly supported and widely used for making digital libraries. Dura Cloud provides complete solutions for developing digital libraries with standard interfaces and open source codes for the both software.

- OCLC is one of the best example for making use of cloud computing for sharing libraries data. For example; OCLC World Cat service is one of the popular service for searching libraries data is available on the cloud. OCLC is offering various services pertain to circulation, cataloguing, acquisition and other library services on cloud platform through Web share management system. Web share management system facilitates to develop an open and collaborative platform in which each library can share their resources, services, ideas and problems with the library community on the clouds.

- Knimbus is another Cloud based research platform facilities to discover and share the scholarly contents. It is knowledge cloud which is dedicated to knowledge discovery and collaborative space for researchers and scholars. Knimbus is currently used in over 400 academic institutions and R&D Labs. Knimbus is a collaborative platform for researchers to share knowledge with peers and facilitates to find and access millions of journal articles, patents and eBooks. INFLIBNET center has incorporated Knimbus cloud service into its UGC INFONET Digital Library Consortium to search and retrieve scholarly contents attached therein.

- NLA (National Library of Australia) set an example of cloud computing. It has used the web to accomplish two tasks. First combining the collections of Australian Libraries with other important Australian and International collections and information sources such as Wikipedia, and secondly to open much of this content so the public can tag it, edit exit, collect it and review it. The explosion of digitization projects in the last decade has driven this gathering of information in new directions, the Hathi Trust, OAIster and Europeana have building a repository of digitized books and journals from major research libraries in the United States. OAIster is a service started by the University of Michigan and now managed by OCLC.

- File Storage: To access any files on the internet, cloud computing presents number of services such as Flicker, Dropbox, Jungle Disk, Google Doc,Sky Drive, DigiLocker (by Govt of India) and so on. These services virtually share the files on the web and provide access to anywhere and anytime without any special hardware and software. Libraries can get advantages of such cloud based ser-

vices for various purpose.

11. Situation of Indian Libraries

In India, cloud computing in libraries is at a development phase. Libraries are trying to provide users cloud based services. But facing several problems . the libraries are not fully successful in this regard. Most of the libraries are not digitized yet . Lack of good service providers, infrastructure, untrained LIS professionals, shortage of funds, advanced technology and other problems are being faced by the Indian Libraries.

In sipte of these problems, Library Associations, govt and open source vendors are trying to digitized the libraries and connect with cloud services. **Digital Library of India** is a good example of digital collection of freely accessible rare books collected from various libraries in India. INDEST (Indian National Digital Library in Engineering Science and Technology) has been set up by Ministry of Human Research and Development. The focus of INDEST is to link all engineering libraries Database and provide resource sharing to community. The application of cloud computing environments is being used in various sectors i.e. Cloud Computing for Healthcare, in Energy systems (Grids, power plants, wind turbine forms etc), Transportation System (ITS: Intelligent Transportation System), Cloud computing for Education (EDUSAT ect) and cloud computing for Mobile Communications.

12. CONCLUSION

Libraries could improve their services and relevance in today's information society. Cloud computing is one avenue for this move into the future. It can bring several benefits for librarians and give them a different future. Libraries are moving towards cloud computing in present time and building digital libraries. One such example has been given with reference Librarian now able to both better assist their users online but also to build a large network of Librarians globally who can answer specific questions and be available 24/7. Other library person can also be benefited from cloud solution i.e. Acquisition Librarian managing better collections, cataloging librarian also seeking information and so on. When using the cloud computing security and privacy should be examined technically and legally. The library staff must know that they have complete access to all their data while using the service so they can take it and re-use it as necessary. In India govt should take initiatives to provide the better environment and infrastructure to Public Libraries especially in rural areas. Till the Public Library system is not improved and linked with Internet, the dreams of digitization will not be fulfilled in India.

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INTERNET OF THINGS – APPLICATIONS IN LIBRARIES

A. RAVI LIBRARIAN GVPCOE(A)

P. INDIRA LIBRARIAN SSCE

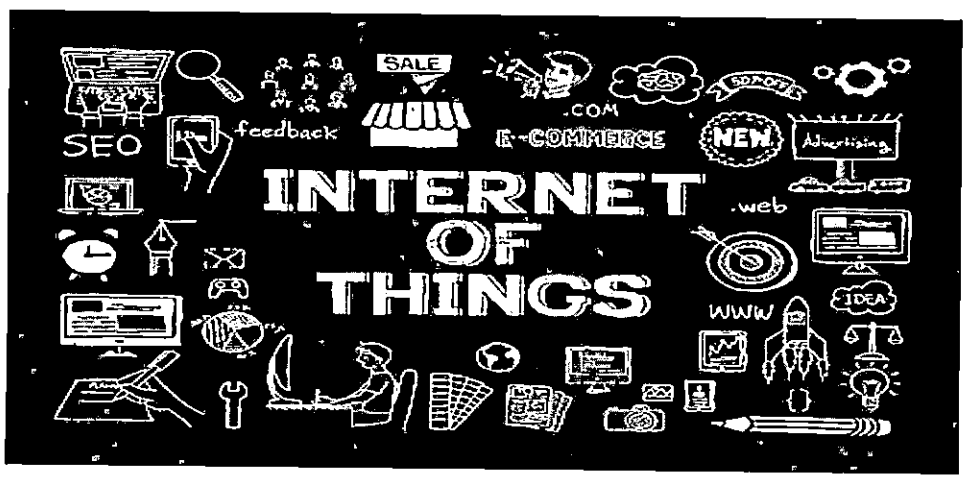
ABSTRACT: In today's world internet plays a vital role in connecting objects and transferring data without any human interference, thereby revolutionizing the life of humans in a drastic way. The extended use of internet from service industries to extend commercial users also has its impact on the libraries and librarians. Hence the librarians must see the potential areas, where the effective implementation can be found.

KEY WORDS : INTER OF THINGS, BIG DATA, LIBRARARIES,

1. INTRODUCTION:

Internet plays a vital role in development of human life, with the advent of new technologies and gadgets. The advent of the Wi-Fi networks lead to the development of technology, with whose effect every individual got accustomed to suffering the net without which life cannot be imagined. These kinds of full speed, high band width networks made the transfer of data fast and reliable also in global networks / connections.

The kind of shift is changing the life common people and also academic research people way of the growth of IoT which is applicable in almost every area development, research, production etc., This way of growth has a combination of effects – both opportunities and threats and threats as well, which are also followed by solutions.



Due to this dynamic change of the technology, the libraries also started shifting towards digitally revolution arised world where many resources are available on the internet i.e. inform of online databases, e-books, e-resources and online courses such on Moocs tutorials, Mock tests, Online examinations etc., The IoT is what is obtained while connecting things which are not operated by humans.

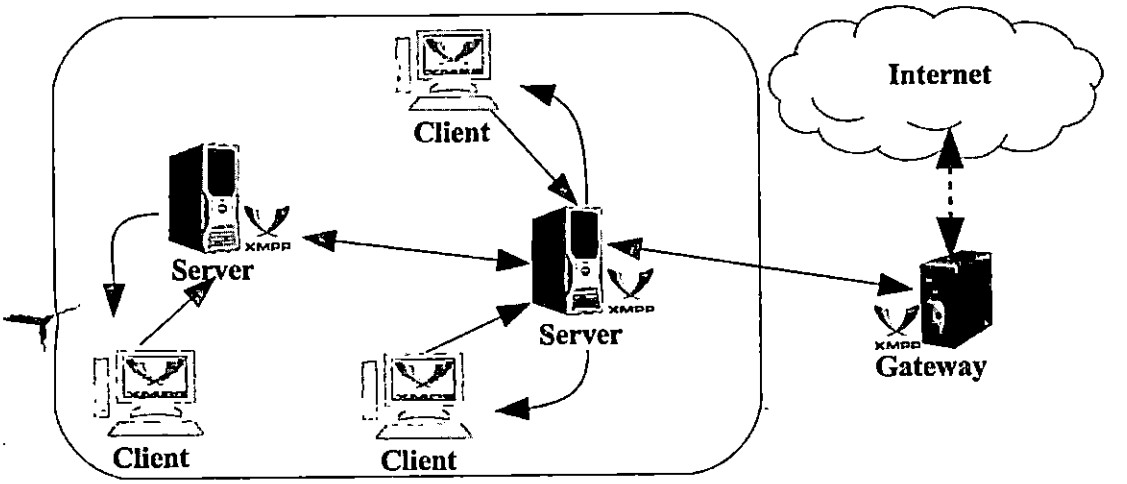


Fig : 1

This figure shows the processes of how data is communicated in a digital library. Various publishers publish different kinds of information relating to book and journals which are sent to the intermediate person who categorize them topic and subject wise where the storage and analyze steps take place. From there the information will be retrieved by various subscribers through the different algorithms available for searching.

In library online journals online data bases and e-books are being available and online library web pages and institutional repository are also developed. There should be good internet connectivity with more bandwidth and high signal with Wi – Fi connectivity.

The data collected must be used in a specific device only. Due to availability of different devices, a large volume of different types of data are available. The collected data must be useful piece of information in which the users must be capable of being acted upon. This is done by analyzing the data its reduce anomalies, there by making it good and available for any kind of request for any kind of users. Any request that is generated is triggered by some sort of algorithms. The Google search engine is also build upon different kinds of algorithms making it easier for usage.

IoT plays a major role in creating intelligent apps which are capable of reading and act autonomously on the data which are based on certain parameters. The intelligent data is a collection of usage specific data which are applicable to various fields like cars, educational resources hospitals etc., provided the right app must be chosen.

The data that is collected or previously available in the libraries make the IoT more useful when the data from different type of devices are combined in creative ways. It is a matter of dealing with what, the technologies call it as "Big Data". It means huge amount of data and data sets cannot be managed in the traditional, relational database technology. RFID is one the tool in IoT. It can be categorized into 4 categories. 1. Passive 2. Active 3. Semi Active 4. Semi Passive. The challenges involved in processing all the Big Data through IoT are 1. Harvesting the data 2. Sorting the data 3. Analyzing the data. Data Harvesting which is called data ingestion in a multi step process which involves data collection by individual devices and then transmitting the data to some sort of central database. It is not the only thing but also involves networking and database.

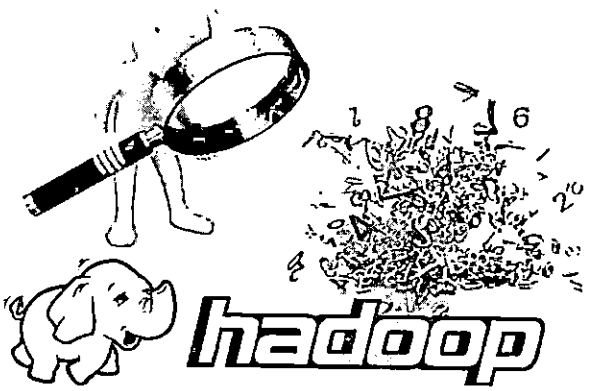


Fig : 1

The storage of data looks simple and deceptive. We need cloud based servers with good amount of storage capacity to hold all the data and information collected. This looks simple and enough but one has to see there is no drop in the cost of storage.

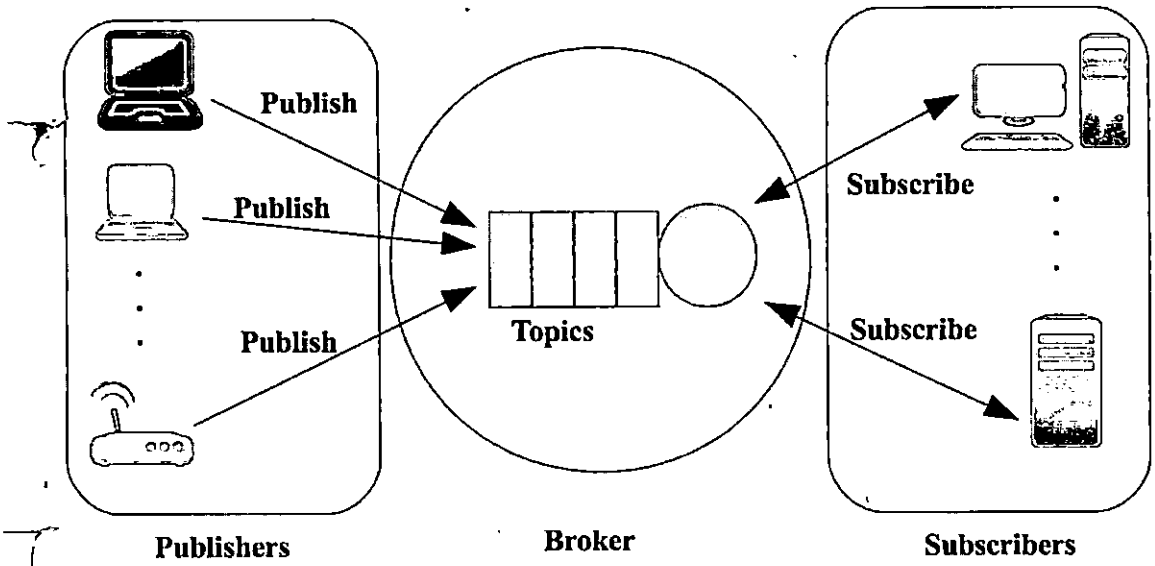


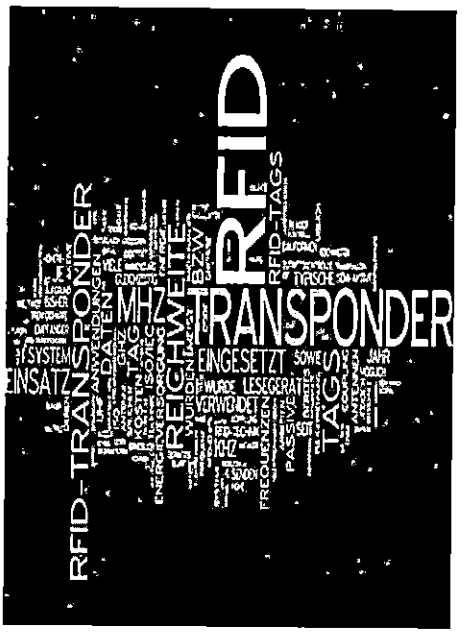
Fig : 2

Fig 2 : Describes the entire network through which the communication takes place. The request generated by different clients reach the servers and from there the processed request reach the gateway from where the request in combination with security promoters reach the internet. After retrieval the information reach the gateway. On applying various filters the information reach the server then ultimately reach the client who ever has placed the request.

Many small scale and some of other industries which are failing to handle such huge amount of data are shifting to one the popular approaches to go with the company offering Database as a service (DBaas) functionality in form of cloud data warehousing. There are many other options like Amazon Redshift, cloudera enterprise and enterprise Hadoop from Horton works. These data base management and automatic services need to install manage and operate their own database while freeing up valuable resources which is important for data analysis phase.

2. IMPACT OF LIBRARIES

IoT though infancy stage has huge potential for libraries. It also acts as a value added services, with all the services which are being offered by libraries. Like few of libraries in IITs, NITs, etc are already changing from print to electronic libraries, many of the other libraries are also trying to more in the same pat. RFID technologies are



familiar with libraries in the way they inter – act with tags, machines and library management services.

Libraries consist of Book and Non – Book materials but with IoT the library management system will be totally transformed to electronic library. The library applications are developed in such a way that users can download the necessary information through these applications. Some of the applications include OPAC, E-Books and E-Resources.

Information literacy is offered to the users to educate them about the library resources available in that library. IoT helps them by setting various devices which also include wireless components setting up digital library, video library studio etc., and making them available in institutional repositories.

IoT would be able to inform to the users about new arrivals in their resources area. Through IoT the library provide the ability in providing reading room, discussion rooms, printers, Scanner Computer etc., during peak and non peak hours. IoT saves the energy cost. Through IoT libraries are controlled not only to library staff but also to users.

3. CONCLUSION :

Librarians taking into considerations various issues before going to adopt to IoT which include privacy, security of data , hacking, host of investment, training of staff and last the decline for use of physical library which directly or indirectly leads to virtual library. Considering all these factors the libraries are prone for change with the usage of IoT which would be the next thing after Internet that is going to bring changes in the library.

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OPEN ACCESS AND OA PUBLISHING POLICIES OF COMMERCIAL AND SOCIETY PUBLISHERS: AN AUTHOR PAY MODEL APPROACH

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Abstract: Today's scholarly communication is driven by the innovations in internet, web and associated technologies. The modern day scholarly communication is solely carried out using web tools and technologies. Open access (OA) has been prolific among scientific community since the advent of internet way back in 1993. This has got a boost with the editors of major publishing houses walking out of their editorial responsibilities for variedreasons. This article dwells into article processing charges (APC) or publication charges associated with the publishing of research articles in OA and hybrid OA journals. The study carried out using five major society publishers, four commercial publishers and their APC as well as publishing policies. The author discusses the publisher policies for accepting articles under APC models and so on.

Keywords: Open access, OA, OA journal, hybrid Open Access, author pay model, publication charges

1. Introduction

Open access (OA) is a mechanism where in, OA facilitates the public access to the scholarly literature by disseminating the public funded research output online worldwide. Here the author participates both as a provider as well as a consumer of the scholarly communication channel. OA provides quality access for educators and students of all classes. Thus, OA may not be completely, but substantially resolves some of the budgetary concerns as well as issues of libraries. This OA phenomenon leads to the faster and larger research impact worldwide, which can promote the research findings quickly, increase the importance of the research output, faster application of the research solutions, generate research funding, increase the reputation of the work as well as the researcher too.

According to a study on 'Free online availability substantially increases a paper's impact'conducted byLawrence (2001)found that an average of 336% more citations to online articles compared to offline articles published.

As a result of the Internet, scientific journal publishing has undergone a revolutionary change in the last couple of decades. This has resulted in two new types of revenue models, electronic subscription access and Open Access (OA). Electronic subscrip-

tion access is a direct continuation of traditional paper journal subscription in digital form. This digital dissemination has made possible by bundling hundreds of journals in a single e-license as well as selling access to articles on an individual basis by the individual publishers as well as clubbing the publications of several publishers through the access provided either by the publisher platform or through the aggregators.

2. Hybrid OA

With the evolution of OA journals as a major medium for scholarly communication, there are many publishers, individualsand groups of people have started bringing out new and innovative OA journals in their respective fields. The last decade of the 20th century as well as first decade of the 21st century have witnessed a proliferation of OA journals in all fields of knowledge worldwide. This proliferation also has fuelled branching of OA, one such phenomena was the twigging out a new concept within the OA journals, the hybrid OA journals. Hybrid OA journals are the business models developed around the principles of OA journals. The difference is that the hybrid journals are nurtured by the commercial or for-the-profit journals publishers such as Elsevier, springer, OUP, CUP and so on.

Springer has pioneered the efforts to moot the idea of hybrid OA, with the acquisition of BioMedCentral journals.Commercial journal publishers have rightly understood the pulse of the readers who want to havefree access to high quality scientific articles. Whereas authors would want to have their workviewed by as many people as possible.

Initially the publishers have been encouraging the publishing of the articles through gold OA. But, on a basis of delayed OA, wherein the publisher accepts the article for publication, then publish the research after some specified time delaypost acceptance. This model has yielded a good result for the publishers, one being the commercial publisher has got a tag in their belt saying they do support the OA movement. The other being, the publisher killing the research output by publishing after some delayed time of the invention, thus delaying the access to the research by time lag. In today's internet driven knowledge era, one year is a too long a period for example, to make the original work a redundant one.

3. Author pay models

Open Access (OA) journals that finance their operations via article processing charges (APCs) is one of the major characteristics feature of the author pay models.Individual researcher funds, Project funds, institution or employer comprises sources of

APC. Following is the snap shot of the source of APC ("Open+access+white+paper," n.d.) for publishing in hybrid OA journals.

4. Need for the study

A lot of propaganda as well as discussions among librarians and scientific community on OA and hybrid OA has been happening ever since the buzz word OA emerged. Still many library professionals are unaware of the fact that the benefits as well as the boon hybrid OA brings on to their desk of a researcher or a librarian. This study is aimed at studying the various publishers (both commercial as well as society) OA or hybrid OA policies in detail. There is no uniform 'author pay charges (APC)' structure or standard available, hence this study would help understand the publishers OA accepting criteria and also studies the associated APC costs as well.

5. Objectives of the study

1. To study the parameters employed by the publishers for accepting the article to be included into hybrid OA or fully OA journals
2. To study different publisher's APC charges
3. To find the various APC pricing models practiced by the publishers

6. Scope and limitations of the study

This study covers both commercial as well as society publishers who are into publishing hybrid OA journals. The scope covers open access publishers which includes both society as well as commercial. The study uses five society publishers, vide Institute of Electrical and Electronics Engineers (IEEE), Association for Computing Machinery (ACM), American Chemical Society (ACS), Oxford University Press (OUP), Cambridge University Press (CUP) only. Four commercial publishers cover Elsevier, Springer, Taylor & Francis, and Wiley-Blackwell only. The scope of the study is restricted to the publisher policies such as APC and what is the criteria for selecting article to be published form the pool of articles submitted to each of the publishers listed above.

7. Methodology

The main source for the data is the publisher websites. The investigator has gathered the data by looking into various other sources such as available published literature, talking to the experts, glancing through the blogs created/ run by the authors

and analysts. The data obtained has been tabulated to present in the form of tables and charts to be able to be understood better by a layman.

Analysis of the data

Table – 1: List of publishers covered in the study

Sl. No.	Publisher	Year of Establishment	Total Revenues	Country of origin	Business type
1	IEEE	1963	$ 413 million (2015)	USA	Society
2	ACM	1947	$ 66.77 million (2015)	USA	Society
3	ACS	1876	$ 507 million (2015)	USA	Society
4	CUP	1534	£ 269.1 million (2015)	England	Society
5	OUP	1478	£ 762.2 Million (2015)	England	Society
6	Springer	1842	€ 943 million (2012)	Germany	Commercial
7	Elsevier	1880	£ 2.07 Billion (2015)	Netherlands	Commercial
8	Taylor and Francis	1852	£ 447.4 Million (2015)	England	Commercial
9	Wiley-Blackwell	1922 (1879)	$ 1.8 billion (2012)	USA	Commercial

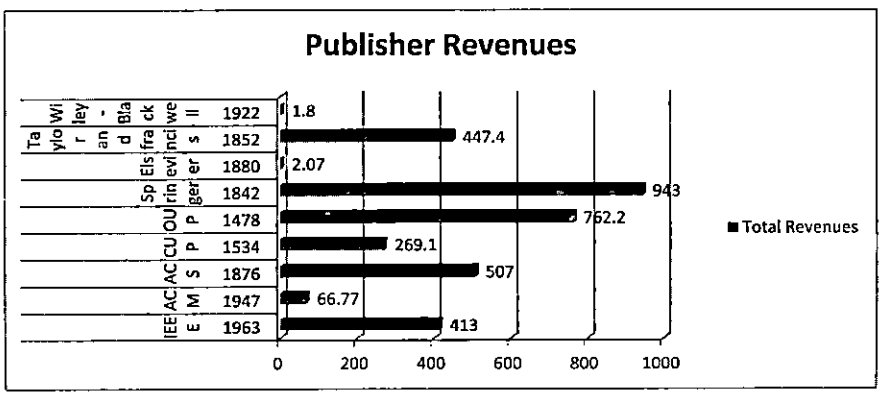


Figure - 1: List of publishers covered in the study

The table-1 and figure-1 shows the details of Publisher, Year of their Establishment, Total Revenues, Country of origin and Business type. Out of the society publishers, OUP stood first in terms of revenues of £ 762.2 Million as on 31 December 2015. ACS stands next in terms of revenues generated with $ 507 million as on 31 December 2015.

Elsevier is the leader among commercial publishers, it is also world's number one publisher in terms of revenues as well as number of journals published with the annual revenues of £ 2.07 Billion for the year 2015. Wiley-Blackwell (a merger of john Wiley & sons and Blackwell publishing in 2007) stands second in the list in terms of revenues with $ 1.8 billion (the data available for the year 2012). Among the establishment of the publishing houses, OUP stands first as it was started in the year 1478 and CUP started in the year 1534 stands second. This implies that the society publishers are the fore runners in the publishing industry in terms of oldest publishing houses.

Table-1:Journals and OA journals: Publisher wise

Sl. No.	Publisher	Total Journals	Total OA and hybrid OA Journals
1	IEEE	50 (100.0%)	47 (94.0%)
2	ACM	45 (100.0%)	14 (31.1%)
3	ACS	56 (100.0%)	05 (8.9%)
4	CUP	250 (100.0%)	224 (89.6%)
5	OUP	395 (100.0%)	13 (3.2%)
6	Springer	2813 (100.0%)	2246 (79.8%)
7	Elsevier	3262 (100.0%)	549 (16.8%)
8	Taylor and Francis	2703 (100.0%)	71 (2.6%)
9	Wiley-Blackwell	2378 (100.0%)	62 (2.6%)

Table-3: APC charges: Commercial publishers

PUBLISHER	APC Charges
Elsevier	**£418/ $665/ €500**
Taylor and Francis	**£ 1,788 / € 2,150 / $ 2,950**
Wiley-Blackwell	**£1356/$1996/€1600**
Springer	**£1256**

Elsevier is the world's leading scholarly publisher, who is also pioneering in open access articles to make it freely available for everyone to read upon publication, as the cost of publishing is recovered upfront through APCs rather than from subscribers. Elsevier's APC prices are set on a per journal basis, ranging from $500 -$5,000.

Taylor & Francis aim to offer authors choice in their route to publishing and that includes when they choose to publish open access (OA). The article publishing charge (APC) is applicable for authors publishing in most Taylor & Francis Open journals. These are lower than the standard APC's.

Springer is the second largest scholarly publishing company and specialises in sciences and bio tech areas. Springer published OA journals are open and freely available online, immediately upon publication. This is made possible by an article-processing charge (APC) that covers the range of publishing services springer known for. The springer article publishing charges in £1256.

Wiley-Blackwell (the merger between John Wiley & sons and Blackwell publishing company) considers accepting article processing charges in all of journals published. It uses the criteria for publishing articles on the basis of authenticity, publicity, Editorial board, Marketing situation, Competitive challenge and so on.

Table-4: APC charges: Society publishers

PUBLISHER	APC Charges
IEEE	$ 1,750 / $ 1,350 / $ 1,750
ACM	$1,700 / $1,300 / $900 / $700
ACS	$4,000
OUP	**£1000 / £2500**
CUP	**£ 5000**

Any article submitted to IEEE implies that no article is guaranteed to be accepted, even though the APC is paid, the article goes through a set-criteria before it gets accepted. Some of the criteria IEEE uses to select an article can be Rapid peer review and faster publication process, Authors gain maximum exposure, New and rapid-decision making process, Reputed scientists forms the editorial board and so on. IEEE's processing fees is a hybrid journal, along with the article processing fee charges in the range of $ 1,750 / $ 1,350 / $ 1,750, there are other associated charges such as application fees, over length Papers, colour page charges, page count per article. IEEE charges the article processing fees of $1,750 for the multidisciplinary mega journal.

When looked at average charges for publishing the article on either fully OA or Hybrid OA journal platforms, CUP's APC charges have the highest average price of £ 5000/ article. It is found from the table-4 that, the Average APC charges of society publishers are comparatively higher than that of commercial publishers.

The APC Charges of ACM varies from $700, $900, $1,300 and $1,700 on the basis on special waivers, ACM members, non-members, special groups and so on. The varied prices are also applying in the evaluation of article publishing such as an author pays, full length papers, full proceeding article and so on.

Papers submitted to OUP OA journals go through the evaluation criteria such as loyalty discount for the regularly publishing authors in OUP publications, applicable charge variation on individual journals, creative commons licenses, normal (excess) page charges and colour charges, authors from developing countries included in List B are entitled to a 50% reduction, fair and sustainable pricing according to prevailing market conditions and so on are effectively adhered to encourage the authors to publish their work under the APC component.

Table-5: Unique APC models by ACS

Criteria / Author Choice	General Price	APC Charges				Creative Commons License	
		ACS Member		ACS Non-Member			
		Immediate	Embargo	Immediate	Embargo		
Member Prices	$4,000	$ 2000	$ 1000	$ 4000	$ 2000	$ 2000 **	$ 1000 *
Discount Price	$ 750						

*- Member price **- Non-member price

The table-5 refers to the ACS, which manages the scholarly publishing program of the words largest scientific society. ACS charges a sum $ 4000 as a general price. ACS members can pay $2,000 for getting their articles immediately published, for the same purpose non-ACS members have to shell out $ 4000. If an ACS member prefers to publish their work on the embargo of access after 12-month basis may need bear $ 1000 and non-member need to pay $ 2000. If someone wants to publish their work under Creative commons license member price of $ 1000 and non-member price of $ 2000 needs to be paid. The special feature of ACS is sometimes, it offers some amount of discount Price for member price to the tune of $750 and so on.

8. Salient findings

- APC charges what authors, project or parent institution pays is exempted from taxes.
- A total of nine publishers comprising 5 society publishers and 4 commercial publishers chosen for the study.
- Out of the 5 society publishers, OUP stood first in terms of revenues of £ 762.2 Million for the year 2015. ACS stands next in terms of revenues generated with $ 507 million for the year 2015.
- APC charges may vary from journal to journal within a publisher
- APC charges agreed at the time of manuscript submission process itself.
- No chance of changing the agreed APC at the time of article submission for review
- APC includes no extra costs other than already agreed APC
- Sometimes the submitting author can request for APC waiver on a case-by-case on the basis of lack of funds.
- Most of the publishers may waive off APC charges if an author is based in a country which is classified by the World Bank as a low-income or a lower-middle-income economy.
- From the study, it was found that Elsevier is the leader among commercial publishers, it is also world's number one publisher in terms of revenues (£ 2.07 billion for the year 2015) as well as number of journals published. Wiley-Blackwell (a merger of john Wiley & sons and Blackwell publishing in 2007) stands second in the list in terms of revenues of $ 1.8 billion for the year 2012. Second highest journals published by Springer.
- Among the establishment of the publishing houses, OUP stands first as it was started in the year 1478 and CUP started in the year 1534 stands second. This implies that the society publishers are the fore runners in the publishing industry in terms of oldest publishing houses.
- Out of 5 society publishers, 4 are based out of USA and 3 are from England. Over all 4 publishers based in USA and 3 are from England, one publisher apiece from Germany and Netherlands.
- Elsevier publishes 3262 journals overall with 549 either fully OA or Hybrid OA journals. Springer stands next with 2813 overall journals with 2246 either fully OA or Hybrid OA journals.
- When looked at average charges for publishing the article on either fully OA or Hybrid OA journal platforms, CUP's APC charges have the highest average price of £ 5000/ article. This is highest among both commercial

and society publishers selected for the study purpose. Next highest APC charges comes from OUP £ 1750/ article.

9. Recommendations

Based on the study conducted, it is recommended that;

1. Library professionals need to advocate more open access journals among their user community for the following reasons:
   a. To counter the disparity between budget and the actual user
   b. requirements
   c. To get the easy and fast access to the scientific literature
   d. To provide more journals access to the user with less or no budget
2. India and its scientific community, in comparison to the world rate of understanding on OA and publishing in OA, are still below par. LIS professionals and scientific community need to work more on this area. Following are few of the suggestions:
   a. LIS community needs to create awareness among the scientificcommunity on OA and OA publishing.
   b. Library budgets should accommodate the cost to cover thepublishing/ publication expenses (to a little extent, to begin with) a.k.a. APC's incurred by the user community to publish their tax payersfunded research output in OA journals
3. It is strongly recommended that, funding bodies in India suchas UGC, CSIR, ICSSR, DST and other organisations to lay more stress onencouraging open access and open access publishing by providingsome percentage of the total project funds for open accesspublishing.

10. Conclusion

The study revealed many aspects of OA and OA publishing. The study also helps the investigation in thorough understanding of all the participating publishers as well as their associated publishing and pricing models, publishing and pricing policies, principle focus of each publisher and their associated activities in encouraging the authors and help enable authorship. The study also enabled the investigation to understand the publishing both society and commercial in detail.

To sum-up, open access has evolved significantly and it is going to be there in spite of a strong competition. Open access initiative has crossed all the hindrances and hurdles; it has come across and continues to pose a threat to the OA opposing bodies. It

the responsibility for scientific community as well as LIS professionals to create more awareness and help enable use of the OA and associated publishing models such as institutional repositories and institutional archives for furthering science communication.

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Open Source Solutions for creation of ETD Archives/Repository: A case study of Central Library @ NIT Rourkela

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Abstract: In academic/research institutions, the Institutional Repository (IR)is the primary source to archive scholarly communication containing data, information, photographs and results of valuable research. These are vital and robust systems that allow institutions to preserve and maintain their digital documents and allow for interaction and collaboration among users in the different institutions. There are numbers of digital library software available as "Open Source" as well as "Proprietary". The open source software helps the libraries especially in eliminating vendor lock-in and reducing the cost-with greater flexibility. These software are generally available free of cost with the capability to capture, store, index, preserve and redistribute all scholarly research materials in digital formats.

This paper deals with open source software (OSS) solutions especially DSpace, EPrints, Greenstone, Fedora projects and others for establishing institutional repository (IR). These OSS have developed a system that allows users to use and submit the contents for IR, and also allows the administrators to organize, configure and customize the IR accordingly to the requirements. The primary attempt of this paper is to discuss the implementation of IR with special reference to Odiya Books &Electronic Theses and Dissertations (ETDs) in Central Library of National Institute of Technology Rourkela (NITR). An attempt has been made to showcase the implementations of various OSS tools and usage ranking of these websites with the help of screenshots.

Keywords: Open Source Software, Electronic Theses and Dissertations, DSpace, Greenstone, EPrints, Fedora

1. Introduction

Libraries in the present era are facing problem of insufficient budget for experimentation&implementation of technology and also procurement of resources.To manage the information resources, there is a necessity of software and tools. This situation is demanding the libraries to stand up alone with the latest technology. Most of the software being used in these libraries are 'proprietary' which means there is involvement of money

without the actual source code availability. On the other hand, Open Source Software is just opposite which revolves around sharing and collaboration. By nature, OSS is free for anyone to copy, modify and redistribute which increases the possibility of being used as per the requirements. There are number of open source software available globally which could be used in library such as basic Operating Systems, Integrated Library Management System (ILMS), Digital Library Software and Document Processing Systems etc[1].

The services and the collection of the libraries and information centers are on high demand due to the application of information and communication technology. Due to shrinking budgets and the increasing prices of resources, librarians have to look forward for alternative solution by which they can collect, store, arrange, and disseminate information to the users. The concept of open access and institutional repository (IR) has evolved to find out the solutions[2].

2. Open Source Software Concept

The Open Source Software is a programme refers to two different related things[2]:

- **Source code:**A collection of instruction written in human readable computer language.
- **Object code:**A sequence of instructions in a computer language, usually a machine code language i.e. binary.

3. Scope of this paper

The scope of this paper is (i) to compare various OSS for building digital repository and (ii) to find out user-friendly OSS based on popularity for creation of digital repository for the prospective institute.

4. Methodology

For this paper, both observation method for data collection and case study methods are followed with reference to Central Library of NIT Rourkela. The following steps are followed for data collection by[2]:

- Surfing internet for IR open source software details
- Evaluatingof the software for different perspectives
- Selecting the appropriate software based on different criteria

5. Open Source Software: An Overview

There are many open source software available for creating Institutional Repository but only 10 OSS have been selected for the study purpose based on its popularity.

DSpace (http://www.dspace.org)

DSpace is open source digital repository software which is used for archiving digital content. It mainly focuses on the long-term storage, easy accessibility and procurement of digital content. This software is developed by Hewlett Packard and MIT, USA released under a GPL license. The DSpace is compiled with Java and utility programs for maintaining assetstore and associated metadata store. It provides the interface for system administration to deposit, modify, search and access the content. DSpace supports PostgreSQL and Oracle relational database management system for storing metadata, accessibility and configuration with two web interfaces JSPUI and XMLUI. It also supports OAI-PMH v2.0 to export METS (Metadata Encoding and Transmission Standard). The latest version of DSpace supports faceted search and browsing functionality using Apache Solr[7].

E-Prints (http://www.eprints.org/uk/)

EPrints is open source software used for creating digital repositoriescompliant with open archives initiative protocol for metadata harvesting with Perl based plugin architecture for importing and exporting data and converting objects (for search engine indexing). The EPrints software is developed by University of Southampton School of Electronics and Computer Science released under GPL license. It is based on LAMP architecture written in Perl and PHP. It supports the Windows, Linux and Mac OS X. The overall appearance of a repository can be controlled using HTML templates, CSS and image. This software is available in many languages[8].

Greenstone (http://greenstone.org)

Greenstone produced by New Zealand Digital Library Project at the University of Waikato and developed and distributed in cooperation with UNESCO is open source software for creating and distributing collection of digital library. It supports Multilanguage and is released under the terms of General Public License.

The main objective of this software is to empower users especially in university libraries and other public service oriented institutions for building their own digital libraries. The complete interface of Greenstone and documentation is available in many languages such as French, Spanish, Russian, English etc[9].

Fedora Project (http://fedora-commons.org/)

Fedora (Flexible Extensible Digital Object Repository Architecture) is open source repository software for the management and dissemination of digital content for access and preservation. It can be used for complex and very large digital collection such historic and cultural materials as well as scientific data. It is capable of archiving different types of content and its metadata with various storage options. The information can be accessed via web API and web based administrator GUI. It also supports & provides RDF search, OAI-PMH, GSearch (Fulltext) and rebuild utilities with multiple & customer driven front-ends[10].

Invenio (http://invenio-software.org/)

Invenio is also open source software developed by the CERN Document Server Software Consortium to manage digital assets of any organization or institute. Mainly this software is used for managing scholarly or published digital content. This software is capable of organizing the collection in navigable collection tree having powerful search engine with customizable simple and advanced search interface, combined metadata, Fulltext and citation search in one go. It also supports flexible metadata standard (MARC) for handling articles, books, theses, photos, videos and many more with customizable display and linking rules. It also produces the output in multi format such as MARC, XML, HTMLand OAI[11].

Omeka (http://www.omeka.org/)

Omeka is open source content management system to manage the digital collection for building archives in any institute or organization to publish and exhibit cultural heritage objects. It is very lightweight in nature in comparison to other repository software such as DSpace, Greenstone, and Fedora etc. It supports Dublin Core Metadata to display the contents. This software is developed by the Roy Rosenzweig Center for History and New Media at George Mason University and being used by many renowned libraries such as New York Public Library, Newberry Library as well as many small libraries[12].

DAITSS(http://daitss.fcla.edu/)

DAITSS is open source digital repository software developed by the Florida Centre for Library Automation. This software is capable of repository management which enables submission, Ingest, Archiving, Accessing, and withdrawal. It supports RESTful web services and micro services for archived content and also implements active procurement strategies. This software is very well suited for materials available in the form of text, documents, images, and audio-video formats[13].

Dienst (http://www.cs.cornell.edu/cdlrg/dienst/software/DienstSoftware.htm)

Dienst is open source software for managing the services running on distributed servers to cooperate in providing the digital library services. This software is supported by the Computer Science Technical Reports Project, a DARPA-funded collaboration to establish a digital library of computer science technical reports[14].

This software can be used in three ways:

- Institutions / Organizations which are willing to join an existing digital library built using Dienst.
- Institutions / Organizations which are willing to create a new distributed digital library with Dienst.
- Institutions / Organizations which are willing to undertake research in digital libraries using an existing Dienst digital library or by experimenting with the software.
-

ETD-db (http://scholar.lib.vt.edu/ETD-db/index.shtml)

The ETD-db is open source software written using Perl Script with MySQL database developed by Virginia Tech. This software provides a standard interface for web users, researchers and library professionals to manage the various fields and metadata related to collection of ETD.

The software is currently maintained by Paul Mather, and is available free of charge to members of the NDLTD[15].

IR-Plus (http://code.google.com/p/irplus/)

IR+ is open source software for building institutional repository and managing its collection with easy features to understand and manage. The main aim of this software is to meet the requirement of any organization/institutions to publish and preserve digital information / content[16].

The major features of the IR+ are:

- Group work spaces - allows a group of people to create a common area to share folders and files.
- Group project pages - similar to researcher pages but will allow a group of users to highlight a group project and expose files in a group workspace.

- Auto-share personal folder - allow a user to set automatic sharing of a file added to a folder.

6. Comparative study of OSS features

Some of the popular OSS have been selected for the comparative study w.r.t. various perspectives. The selection criteria of these OSS have been made based on the wide usage of OSS around the world.Table 1mentioned below shows the current software available for creating the ETD/Archive with URL to download. These software are freely downloadable and can be used for the said purpose.

Table 1: Comparative study of OSS features

Attributes	DSpace	E-Prints	Fedora	Greenstone	ETD-db
Platform Window & Linux Windows & Linux			Linux	Windows, Linux, MAC OS	UNIX-based
Server	Apache Tomcat	Apache	Tomcat	Apache	Apache
Supporting Software	Java, Maven, Ant	PHP, Perl	Java, Jetty	Java, Image Magic	
Database	PostgreSQL &Oracle	MySQL	Many storage options (database and file systems)	Flat file	MySQL
Language	Java	PHP based	Java	C++, Perl	Perl
Scalability	Stable & can be upgraded	Stable & can be upgraded	Stable & can be upgraded	Stable & can be upgraded	Stable & can be upgraded
Standards Compliance	OAI-PMH	OAI-PMH	OAI-PMH Provider Service	Metadata extraction	OAI-PMH & XML encoded MARC
Search	OpenSearch	Open Search	GSearch (Fulltext) Search Service	Automatic Indexing	Open Search
Report generation	Yes	Yes	Yes	Yes	Yes

7. Open Source Repository Software @ NIT Rourkela: a case study

On 15th August 1961, the institute was founded as the Regional Engineering College, Rourkela (REC) under joint management of the Government of India and Government of Orissa for imparting quality education in the field of Engineering and Technology. The college was designated, on 26th June 2002, as the National Institute of Technology, a fully autonomous Institute supported by the Ministry of Human Resource Development, Government of India. On 15th August, 2007, on its 47th Foundation day, the Institute was declared to be an Institute of National Importance by an act of the Parliament. Over the years, NIT Rourkela has strived to establish itself as one of the premier national level institutions for carrying out front line research and imparting quality technical education in the country [17].

Today, NIT Rourkela is a highly prestigious institute with a reputation for excellence in research, consultancy and education at undergraduate, postgraduate and doctoral levels. It is passionately committed to make our country a world leader in technology and science and to inculcate this commitment among all its students. The target is to be known around the world for the academic standards and to be counted among the best technological institutes of India in terms of innovation, entrepreneurship and creation of intellectual wealth [17].

For archiving and disseminating the scholarly output, the central library of NIT Rourkela has been using the following software.

DSpace for Institutional Repository (http://dspace.nitrkl.ac.in/dspace)

The Central Library of NIT Rourkela has been using DSpace since 2006 for managing Institutional Repository for the scholarly contents of the institute which includes Book Chapters, Journal Articles and Conference Proceedings.

The Central Library has recently upgraded DSpace (from version 1.2 to 4.2) with the following practical features:

- Authentication&Authorization
- Dynamic HTML support
- OAI-PMH Support&Object Management
- Import / Export, Report Statistics
- Handle System
- Customization & Types of document supported
- Standards Compliance, Optimized Search and Browse
- Ranking, Embargo

It was really a tough task to upgrade DSpace from version 1.2 to 4.2 as there had been a long gap in release of different version of DSpace. It had the problem of compatibility of database PostgreSQL as version 7 was used in 1.2 and 9.2 in DSpace 4.2. Availability of proper documentation was another challenge to proceed with. The dependency on DSpace forum was a great help to start with hit and trail to up-grade and reach up-to the version DSpace 4.2. At last, the rigorous effort made successfulup-gradation of DSpace.

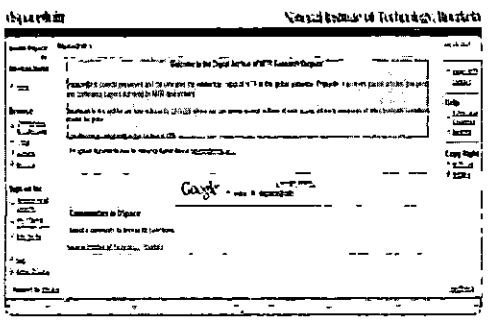


Figure 1. DSpace version 1.2

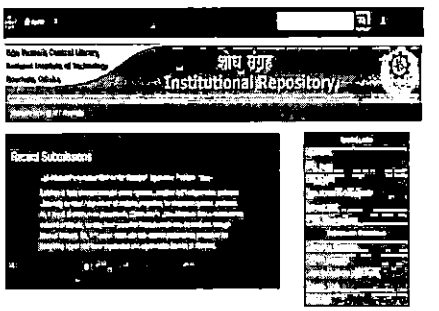


Figure 2. DSpace version 4.2

E-Print for Electronic Theses & Dissertations (http://ethesis.nitrkl.ac.in/)

The central library has two other types of collections i.e.Electronic Theses & Dissertations and Odiya Books which were to be archived in order to provide the better access to these resources. The BPCL evaluated many open source software based on the following criteria in order to select the suitable software for the purpose. These are as follows:

- Authentication & Authorization
- Dynamic HTML support
- Object Management
- Import / Export
- General Statistics
- Customization & different types of document supported
- Standards Compliance
- Optimized Search and Browse
- Embargo

The installation of E-Prints was done with the version 3.1 in the year 2006. Later, up-grading E-Prints was tough task as it was to be changed from one database structure to the next database structure. In order to upgrade the E-Prints, the major help was received from the forum and also from the different institutes who have already upgraded their repositories to next version.

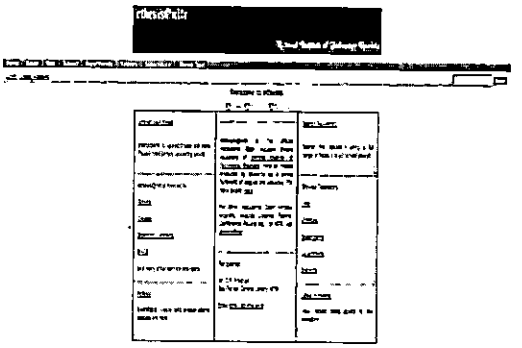


Figure 3. E-Prints version 3.1

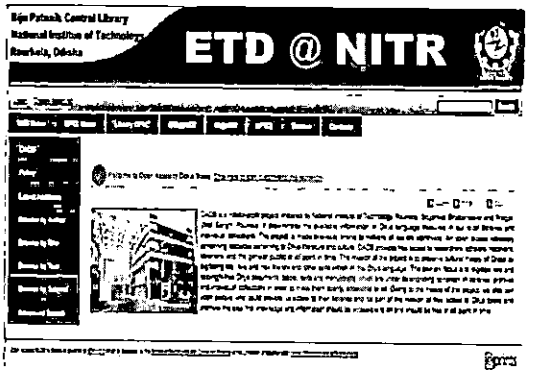


Figure 4. E-Prints version 3.3

E-Print for Open Access Odiya Book Project (OAOB) (http://oaob.nitrkl.ac.in/)

OAOB is a not-for-profit project, initiated by National Institute of Technology, Rourkela, Srujanika, Bhubaneswar and Pragati Utkal Sangh, Rourkela. It disseminates the available information in Oriya language treasured in our local libraries and individual collections. The project is made available online to millions of readers worldwide. An open access repository containing resources pertaining to Oriya literature and culture, OAOB provides free access to researchers, scholars, historians, librarians, and the general public at all point in time.

The mission of the project is to preserve cultural history of Orissa by digitizing old, rare and new literary and other texts written in the Oriya language.

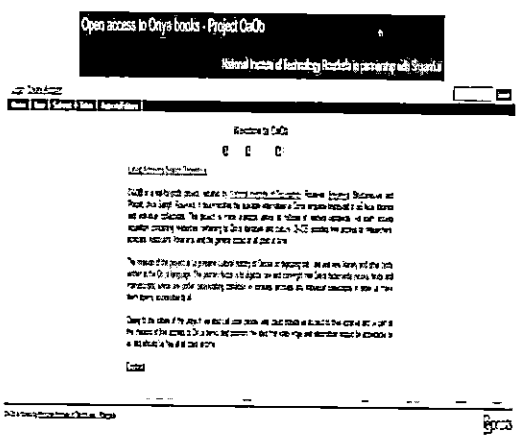


Figure 5. E-Prints version 3.1

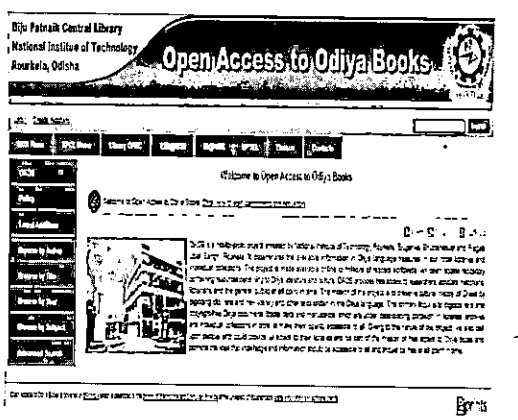


Figure 6. E-Prints version 3.3

Greenstone Digital Library software:

In the early bid of time, the NIT Rourkela started its digital library project with GSDL to archive the ETD and subject question papers. In later stage, this GSDL software helps in organizing the proprietary software procured by the Institute with its demonstration. Presently, this software helps the central library to organize the procured CD-ROM database in ISO format.

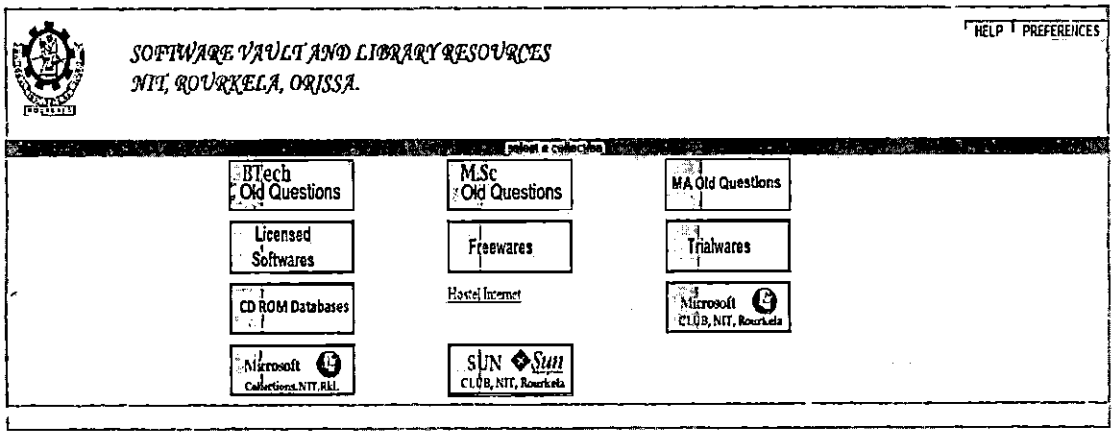


Figure 7. Greenstone DL for various resources

8. Challenges for adopting OSS in libraries:

Some of the challenges to be taken care of in libraries for adopting OSS are as follows:

- Archival Policies, embargo, etc.
- Proper user training of library staff
- Support from technical expertise
- Frequent up-gradation of the OSS
- Proper database creation and up-dation
- Enabling OSS to comply with aforesaid attributes

9. Conclusion

Due to tremendous growth in inter and multi-disciplinary subjects, there has also been growth in research outputs. The main challenge for every academic library is to manage these resources in effective way to serve the academic fraternity and provide the research output. The details mentioned above in the paper describe the different available open

source software for creating ETD/Archive in order to manage the research output effectively. Though, every software has the capability to meet the requirements of **IR** and **ETD** but **DSpace, E-Prints and Greenstone** have more popularity due to its simplicity, flexibility, easy to use and easy accessibility through web-browser. This particular paper mainly focuses on the available Open Source Software for creating Archive/ETD with special reference to central library, NIT Rourkela.

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DSpacehttp://www.dspace.org

EPrintshttp://www.eprints.org/uk/

Greenstonehttp://www.greenstone.org/

Fedorahttp://fedora-commons.org/

Inveniohttp://invenio-software.org/

Omekahttp://omeka.org/

DAITSS(http://daitss.fcla.edu/)

Dienstthttp://www.cs.cornell.edu/cdlrg/dienst/software/DienstSoftware.htm

ETD-dbhttp://scholar.lib.vt.edu/ETD-db/index.shtml

IR-Plushttp://code.google.com/p/irplus/

NITR http://nitrkl.ac.in

Research and Publishing Trends by Biotechnology Scientists: A Bibliometric Analysis of Indian Journal of Bio-technology from 2011-2015

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Abstract: The present study contains a bibliometric analysis of Indian Journal of Bio-technology. The study covers twenty issues published from 2011 to 2015.The study includes year-wise distribution of contribution in bio-technology field. Authorship pattern, country-wise distribution across the world are being taken up for this study. In the field of Bio-technology, it is observed that collaborative research is predominant; the degree of collaboration in *Indian Journal of Bio-technology* research is 0.97 which clearly indicates its dominance upon multiple authored contributions. Universities are major contributor of the Bio-technology & its allied areas as compared to that of the *Research Institutes and Colleges.* Majority of the articles are in between 6-10 pages in length, Maximum number of citations i.e. 23.26 %(80) received in the year of 2015. The study analysis of results can indicates that the trend of collaborative research is increasing in the field of Bio-technology.

Keywords: Bibliometrics, Bibliography, IJBT, Degree of Collaboration, Authorship Pattern, Country-wise Distribution

1. Introduction

The word 'Bibliometrics' constitutes one of the major thrust areas of research in the field of library and information science. Bibliometric analysis is currently used for evaluating the qualitative and quantitative research growth in a specific field through the analysis of publications. The term statistical bibliography was first employed by Hulme to refer to the application of quantitative techniques to libraries in 1923. In 1969 Alan Pritchard coined this term it is appeared in his article Statistical Bibliography or bibliometrics in December issue of the Journal of Documentation.

It flourished in early 20th century with the works of Lotka, Bradford and Zipf who observed distribution pattern in word frequency, author and journal productivity. A principal assumption underlying the use of Bibliometric indicators is that scholars publish their research findings in the publicly available literatures and that one may obtain pictures of scholarly activities from a quantitative analysis of scholarly documents[GAR-

FIELD,1979]. A careful evaluation of periodical literature may indicate a complete picture of the discipline, the profession with which it repents and everything connected with them.

2. About: IJBT Journal

In order to analyse the Indian Journal of Biotechnology Research, the primary sources used by the investigator are issues of the journal volume 10 to 14 for the period years 2011 to 2015. 20 issues of the journals are taken as the sources of data. Indian Journal of Biotechnology is a leading quarterly journal, published by the National Institute of Science Communication and Information Resources (NISCAIR), New Delhi. It started as a quarterly journal in 2002, publishes full papers, short communications and reviews in agricultural, animal, environmental, industrial, medical, and microbial biotechnology, bioinformatics, and socio-legal and ethical aspects in biotechnology. The latest developments in biotech- industry are covered under Notes and News. Data was collected from their website: http://www.niscair.res.in; http://nopr.niscair.res.in for analyzing and arrive its results.

3. Review of Literature

As a platform to the present study, some of the pertinent studies conducted in the area of Bibliometric studies are worthy of examination. In this context, Oyedokun (2001) analysed scientists' activities in the agricultural research institutes in Nigeria and reported that activities of scientists in agricultural research institutes span through technological development and delivery.

Hussain and Fatima (2011) conducted a Bibliometric and analysis of Chinese Librarianship: an International Electronic Journal from 2006 to 2010 and revealed the scholarly communication trends of this journal during the period taken under study. However, the present study promises to add yet another portrait to the map of bibliometrics.

Hadagali and Anandhalli (2015) have revealed that the growth of neurology literature for the period 1961-2010. A total of 291702 records were collected from the Science Direct Database for fifty years. The Relative Growth Rate (RGR) and Doubling Time (Dt) of neurology literature have been calculated, supplementing with different growth patterns to check whether neurology literature fits exponential, linear and logistic model. The result of the study indicate that the growth of literature in neurology does not follow the linear or logistic model. However, it follows closely the exponential growth model. The study concludes that there has been a consistent trend towards increased growth of literature in the field of neurology.

Velmurugan C and Vadhakrishnan, N(2016) , in their paper present a bibliometric features and characteristics of the journal titled 'Indian Journal of biotechnology'. It publishes four issues per year by NISCAIR, New Delhi. The data were downloaded from the journal's website. The Bibliometric analysis has been conducted with 448 contributions published in the journal selected six years for a period between 2007 and 2012. The analysis covers mainly discuss the each article, year wise distribution of contributions, and number of authorship, volume wise authorship, author's productivity and the single and multi- authored papers and also many more features. Findings of the studies pointed out towards the advantages and weakness of the journal which are helpful for its further development. The result revealed that the highest number of contributions i.e., 87 (19.41 %) were published in the years 2007. The highest number 436 (97.33 %) articles were contributed by joint authors and the rest of 12 (2.67 %) articles contributed by single author. The degree of collaboration is 0.97. The average length of the articles varied from a minimum of 5.94 pages in the year 2012.

Neelamma and Gavisiddappa **(2016)'s** paper is to determine the materials cited in zoology literature during the year 2005–2014. Data was extracted from Web of Science (on-line version database) database. The study reveals that distribution of citations for document type, language wise distribution of citations and country wise distribution of citations. Further the study also lists out the most productivity journals in the area of zoology literature. The analysis of the results shows that out of 5332 citations, research articles (74.81%) contribute the highest number of citations and it is the most preferred sources of information used by researchers in the area of zoology. The USA (33.75%) is the most cited country in the world and the English language (98.59%) is the most preferred language in the world. Bradford's law well fitted into the given data set for the present study. Finally it can be concluded that, The Significant research activity is being taking place in the field of zoology and it is one of the emerging research field in the biological sciences.

4. Objectives of the study

The study follows the following objectives

- To make an analyzes of articles published in IJBT from 2011 to 2015
- Year wise distribution of contribution
- Authorship pattern
- Collaborative Research
- Length of the papers
- Institution wise Distribution
- Length of the keyword

- Citation analysis
- Country wise distribution of Contributions

5. Methodology

Indian Journal of Bio-technology (IJBT) has been used as the source for the main present study. All issues for the years 2011 -2015(Vol. 10 – 15) have been collected for the purpose of this study. The relevant papers for the study have been downloaded from NISCAIR website. The 375 papers selected for present study were entered into a Microsoft Excel Spread Sheet which identified variable such as author, author's affiliation, country of origin, year of publication, number of citations, length of papers etc. It should be noted that guest editorials, short communications are excluded from the study. Finally, all relevant data were sorted, tabulated and assimilated in a logical order for analytical purpose.

6. Data Analysis and Interpretation

Year wise Distribution of Articles in IJBT

Table -1 Year wise distribution of Article

year	No of records	%age	Cum Records	cum %age
2015	81	21.60	81	21.6
2014	80	21.33	161	42.93
2013	73	19.47	234	62.40
2012	75	20.00	309	82.40
2011	66	17.60	375	100.00
total	**375**	**100.00**		

Table -1 analysed that a total of 375 articles were published in India Journal of Bio-technology research in the year from 2011 to 2015. Out of 375 contributions from selected five years, 21.60%(81) research articles were published in the year of 2015, 21.33(80) research articles were published in 2014 ,20%(75) research articles were published in the year of 2012 and 19.47%(73) research articles published in the year of 2013

This analyse reveals that more research articles on Bio-technology sector was published in the years of 2015 and 2014 as compared to 2013 and 2011 (Fig 1)

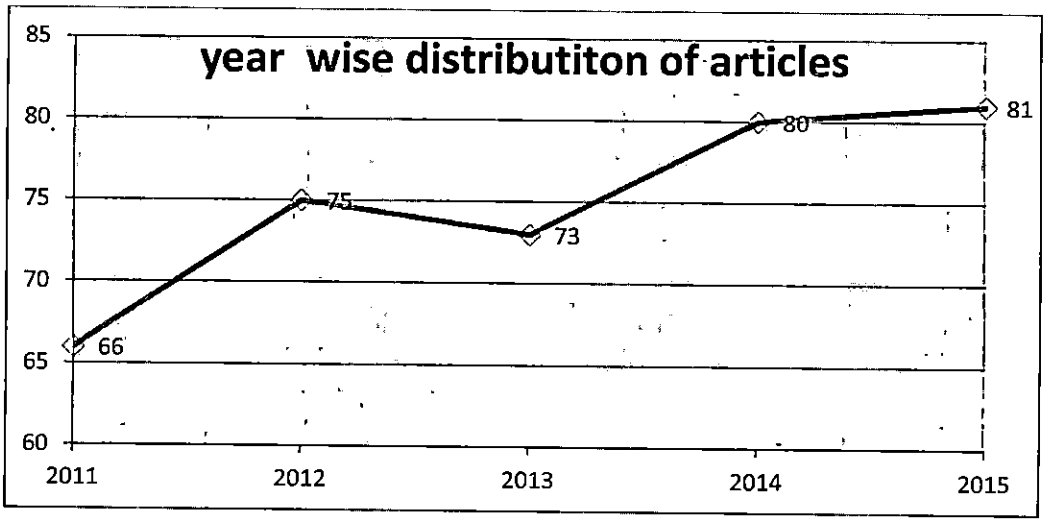


Fig 1

Table -2 Authorship pattern wise distribution of article

No of authors	Frequency	% age	cum %
1	11	2.83	2.83
2	80	20.57	23.40
3	97	24.94	48.33
4	81	20.82	69.15
5	44	11.31	80.46
6	34	8.74	89.21
7	17	4.37	93.58
8	10	2.57	96.15
9	10	2.57	98.72
10	1	0.26	98.97
11	2	0.51	99.49
13	1	0.26	99.75
14	1	0.26	100.00
	389	100.00	

Table- 2 gives a detail over view of authorship pattern of papers published from 2011 to 2015. It reveals that out of 375 contributions, a total number of 97 (25%) contributions have been contributed by three authors, followed

by 81(21%) contributions by four authors , 80(20.57%) contributions by two authors , 44(11.31%) contributions by five authors, 34(8.74%) contributions by Six authors, 17(4.37%) contributions by seven and more than seven authors(Fig 2). It can be concluded from the above discussion that, three and four author pattern is more in the area of Bio-technology

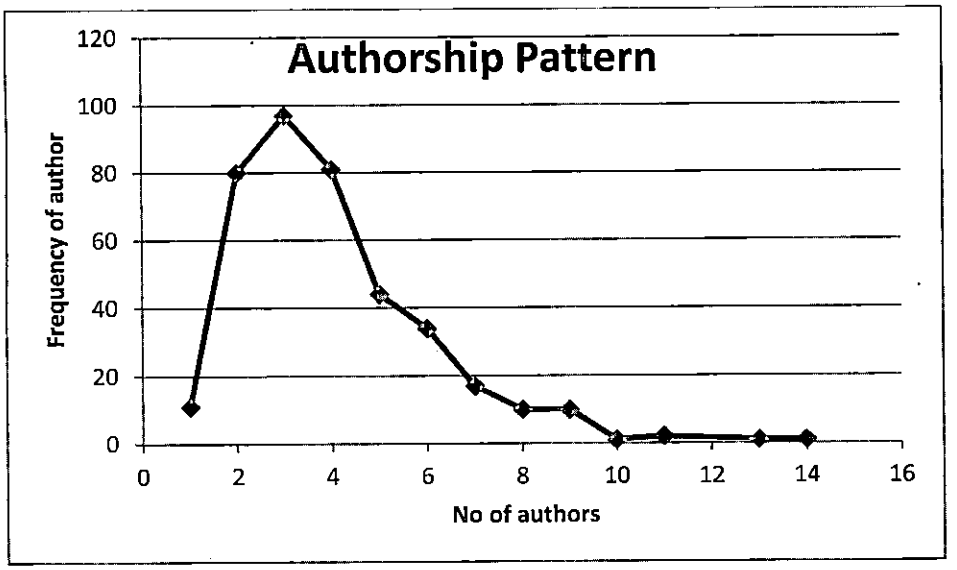


Fig-2

Degree of Collaboration

Table – 3 Degree of Collaboration

Degree of Authors Collaboration				
Year	Single Authored Paper(Ns)	Multi Authored Paper(Nm)	Nm+Ns	C= Degree of Collaboration
2015	4	77	81	0.95
2014	2	76	78	0.97
2013	2	73	75	0.97
2012	1	74	75	0.99
2011	1	64	65	0.98
Total	11	364	375	0.97
			Average	0.97

Table -3 An examination of the degree of collaboration, a prominent area of enquiry in bibliometric studies, indicates the trend in patterns of joint authorship in IJBT from 2011 to 2015, as shown in table -3. The degree of collaboration ranges from 0.95 to 0.99. The average Degree of Collaboration is 0.97 from the period study. It indicates that 97% of the resource is being taking place in to Collaborative research mode

The extent of collaboration in research can be measured with the help of the formula given by K Subramnyam(1982)

C=

Where C= Degree of Collaboration

Nm= Number of multiple authors

Ns= Number of single authors

Table -4 Lengths of pages published during 2011 to 2015

Length of pages	Year					% age	
Pages	2011	2012	2013	2014	2015	Total	%age
1 to 5	22	37	37	28	25	149	39.73
6 to 10	40	34	35	48	52	209	55.73
11 and more	5	4	3	2	2	16	4.27
Total	67	75	75	78	80	375	100.00

Table-4 reveals the length of pages in different issues of IJBT during 2011 – 2015. Out of 375 papers more than half of the papers are in between 6-10 pages in length i.e. 209(55.73%) while 149(39.73%) papers covered 1 – 5 pages, 16(4.27) papers have covered 11 and more pages. The study reveals that majority of the articles are in between 6 to 10 pages in length

Table – 5 Institution- wise Distribution

Institution wise Distribution				
Type of instituon	No.of Articles	%age	**Cum no of records**	**Cum % age**
College	48	12.8	48	12.8
Research Institution	132	35.2	180	48
University	195	52	375	100
Total	375	100		

Table – 5 reveals that out of 375 contributions, (majority of the research output 52%) have been contributed by universities, 35.2% (132) by research institutes and 12.8%(48) by colleges. This indicates that universities are major contributor to the Bio-technology and its allied areas as compared to that of Research Institutes and Colleges. (Fig -3)

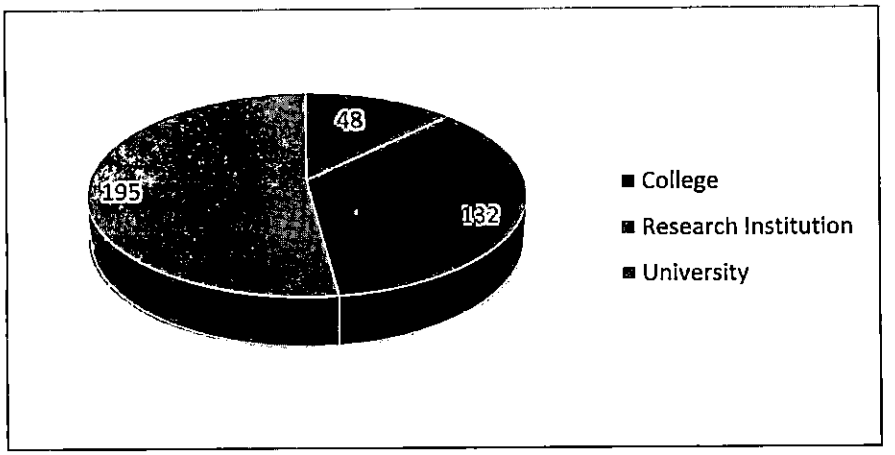


Fig -3

Table - 6 No of the Keywords

No of Key-words	Frequency	%age	Cum records	Cum %age
1 to 5	243	64.80	243.00	64.80
6 to 10	127	33.87	370.00	98.67
11 and more	5	1.33	375.00	100.00
Total	375	100.00		

Table-6 reveals the no of the keyword in different issues of IJBT during 2011 – 2015. Out of 375 papers more than half of the papers i.e.243(64.80%) are in between 1 to 5 keywords while 127(33.87%) 6 – 10 keywords and 5(1.33) papers have 11 and more than 11 keywords. It can be revealed that majority of the articles have 1 to 5 keywords.

Table -7 Year wise Distribution of Citations

Year	No. of Articles	No of citation	Avg/Citation	% age	Cum %age
2011	67	1741	25.99	17.89	17.89
2012	74	1718	23.22	17.65	35.54
2013	76	2059	27.05	21.15	56.69
2014	78	1954	28.30	20.08	76.77
2015	80	2264	26.14	23.26	100.03
Total	375		Avg=25.93	100.03	

Table – 7 reveals that total numbers of citations are 2264 out of 375 articles from the year of 2011 to 2015. 23.26%(80) of citations were received in the year of 2015, 21.15%(76) of citations were received in 2013 and least number of citations were received in 2011. It can be summarized from above analysis that on an average 25.93 citations are received in the area of Bio-technology.

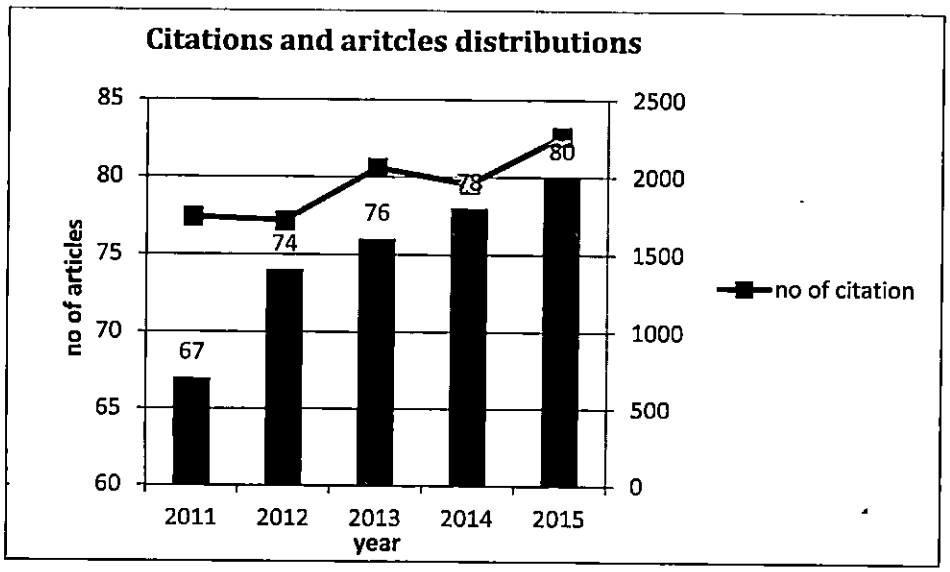


Fig -4

Table – 8 shows country wise distribution of contributions by authors, which indicates that, out of 375 contributions from 20 countries 322(85.86%) contributions from India alone. China has contributed 5(1.33%) contributions, Malaysia has contributed 4(0.8%) contributions, Bangladesh has contributed 3(0.8%) contributions , Iran has contributed 3(0.8%), Italy has contributed 3(0.8%) where as the countries like

Egypt, Turkey and Bulgaria have single contribution.

This study also reveals that most of the research articles 322(85.86%) contributions are by Indian researchers (Fig- 5)

Table – 8 Country wise Distribution of Articles

County wise Contribution	Total	%age
India	322	85.8667
China	5	1.33333
Malaysia	4	1.06667
Bangladesh	3	0.8
Iran	3	0.8
Italy	3	0.8
Bangladesh and USA	2	0.53333
Egypt	2	0.53333
Turkey	2	0.53333
Bulgaria	1	0.26667
Others	18	4.8

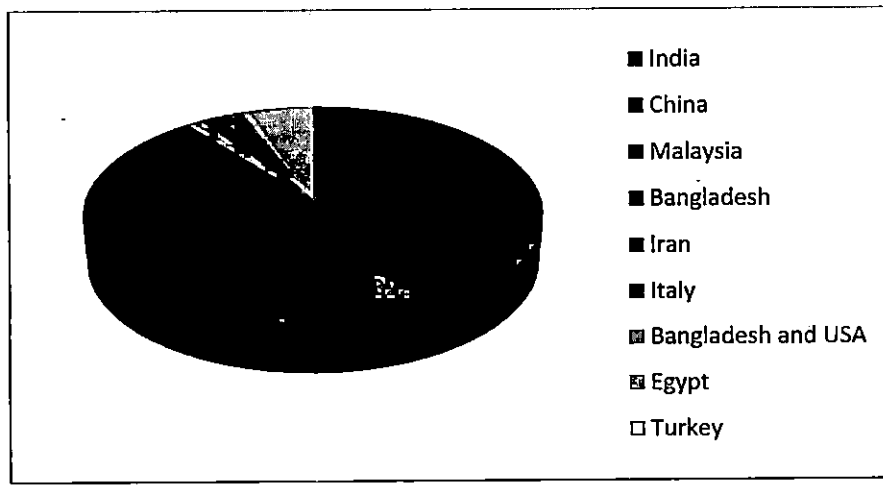


Fig-5

7. Findings

- Majority of the research articles on Bio-technology was published during the year 2015
- The study revealed that maximum no. of citations 2264(23.26%) produced in the year 2015 followed by 2059(21.15%) in 2013.
- On an average 25.93 Citations are received in the field of Bio-technology.
- Collaborative research predominates in writing of articles in the field of Bio-technology. The degree of collaboration in Indian Journal of Bio-technology is 0.97 which clearly indicates its dominance upon individual contribution.
- Universities are major contributor of the Bio-technology and its allied areas compared to that research institutes and colleges.
- The scope of publication of research articles in Indian Journal of Bio-technology research is going international.
- Majority of the research articles in Bio-technology were contribution from India

8. Conclusion

The bibliographic analysis of the articles in 20 issues of Indian Journal of Bio-technology research shows the various characteristics of the published literature in Bio-technology. The publishing trend totally depends on the productivity pattern of the authors. Now days we can see the collaborative research is visible in all the areas of knowledge, particularly in science and technology and with special reference in Bio-technology. The present study reveals that the trend collaborative research is increasing in Bio-technology discipline. Majority of the research articles on Bio-technology was published during the year 2015

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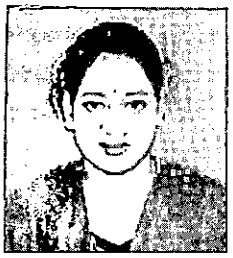
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Curriculum Vitae



PhD Scholar working on the title "Indian Contribution to Biological Science Literature from 2007 to 2016: A Scientometric Analysis" under the guidance of Dr. Gavisiddappa Anandhalli Assistant Professor (gavi.vijju@gmail.com) Dept. of Library Information Science. KSWU Vijayapura

Role of libraries in Open Source Movement

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Abstract: The article defines the open source softwares as software which is developed by public collaboration and describes its emergence in detail. It also depicts that open source softwares are needed for Indian libraries because of its several features which is essential for converting the traditional library into a modern library at minimum cost. It describes the features of different type of open source softwares under the categories of library automation and management, Digital library and Institutional repository and content management softwares. At last, it is said that the libraries should come forward to adopt the open source softwares for their automation work and services of the libraries.

Keywords: Open source softwares, Source code, Open access initiative, Institutional repository, Library solutions, Public collaboration, Proprietary softwares.

1. Introduction:

The term software means two different but related things in which one is Source code which is a set of human readable and understandable instructions that comprise the recipe from which and executable program can be made. Other one is Object code which is an actual executable program which is compiled of machine readable source code [1].

Open source software is the software which is developed, tested, or improved with the help of the public collaboration and distributed with the concept that it must be shared with others for an open future collaboration. Budapest Open Access Initiative define that open access means free availability of information on the public domains of internet permitting any users to read, download, copy, distribute, print, search or link to the full-texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.

The Open Source Definition was originally derived from the Debian Free

Software Guidelines (DFSG). Bruce Perens had composed the original draft of the DFSG, and it was edited, refined, and approved as formal policy by the Debian developer community in 1997. The Open Source Definition was then created during the launch of the OSI in Feb. 1998 by revising the DFSG and removing Debian-specific references [2].

Open source licenses grant computer users permission to use open source software for any purpose they wish. Some open source licenses called as copy left licenses stipulate that anyone who releases a modified open source program must also release the source code for that program alongside it. Some open source licenses stipulate that anyone who alters and shares a program with others must also share that program's source code without charging a licensing fee for it.

Libraries are playing a vital role in open source movement which is the need of today. Open source softwares are very much cost effective and its maintenance is also not costly and the purpose of the libraries and purpose of the open source softwares are almost same in terms of sharing the resources.

2. Emergence of Open Source Software:

Up to the year of 1980s, the importance of software understood by every one but due to the ever increasing cost involved in it, technology leaders began speaking on this issue. Therefore, the GNU project was launched in 1984 to create a complete computer operating system that was free from constraints on use of its source code, and also protest the costs and limitation of commercial software. In 1991, the Linux operating system emerged under the GNU public licenses. Millions of people use GNU/ Linux today. Eric Raymond had given 19 guidelines in his book for creating good open source software and provided the final push to make the case for releasing source code to the public. Therefore the term "open source software" was coined in 1998 when Netscape finally released the source code for its cutting-edge web browser [3].

3. The need of Open Source Software:

The libraries are in need of softwares of which cost is low and there is chance to make necessary amendment in the software if needed according to the work process. The open source software can fulfil the following need of libraries also. Therefore it is needed in the Indian libraries.

- The budget of the library creates hindrance in purchasing and maintenance

of the good library softwares. Therefore there is need of open source software which is available free or at a minimal cost and it is not essential to purchase addition licenses for every computer or for every person who is going to use the software. It is less costly than proprietary software. It often has lower implementation and support costs as well.

- Libraries always have to approach the software developers or vendors for installation or evaluation of package in case of proprietary softwares which is time taking process. Therefore there is need of the software where is no need to approach the software developers or vendors for installation or evaluation of package because librarians and systems administrators can install complete production-ready versions of software and evaluate competing packages without paying any license fees, but also without having to wait for a vendor's trial period and evaluate a limited version of the software, or deal with the vendor's sales personnel.
- The library have a need of additional features in the package and this need can be fulfilled because there is provision to add these features themselves with the help of the available source code. For this purpose library can use in-house expertise or hire a consultant to make the changes that they desire.

4. Open Source Softwares for Libraries:

The open source softwares are categorized below under the different categories which depict the features of the open source softwares developed for the specialized functions of the libraries.

Library automation and management software:

- Koha:

Koha is a promising full featured open source ILS (integrated library system) currently being used by libraries all over the world. It is the first open source integrated library management system. Koha is a 100% browser-based open source integrated library system. There is no need to install a desktop client to access staff/library functionality. It is constantly growing and improving. It meets the user needs in a better way. It includes clear interface for librarians and members(patrons), customizable search, circulation and borrower management, cataloguing module with integrated z39.50 client, Web 2.0, full acquisitions system including budgets and pricing information, ability to cope with any number of branches, patrons, patron categories, item categories, currencies and other data, serials system for magazines or newspapers, reading lists for members, etc. Its new features include a new user interface design, more advanced search functions,

better multibranch capabilities, user tagging and many generic enhancements.

- New Gen Lib (New Generation Library):

NewGenLIb (New Generation Library) is and integrated Library Automation and Networking Solution Developed by Verus Solutions Pvt Ltd and The Kesavan Institute of Information and Knowledge Management, India. New GenLib is a fully web based integrated library management software that runs on distributed computers through a network or server. It can also run on local area networks without access to the internet but some advantages will be lost. It uses a number of well supported and widely-used, reliable and well tested open source components like PostgreSQL, Apache Tomcat, and Solr Lucene. NewGenLib is entirely Java-based and fully MARC 21 compatible.

- Evergreen:

Evergreen is an open source ILS and was designed from the ground up to support a large, geographically-dispersed, multi-tiered library consortium. Evergreen was initially developed at the Georgia Public Library Service for its PINES consortium. The software was designed to operate on a cluster of inexpensive commodity servers. It can handle the largest consortia.

Digital Library Software/Institutional Repository Software:

Institutional repositories are digital collection of the research outputs created within a university or research institution. The main purposes of the institutional repositories are to provide Open Access to the institution's research output. The following open source digital library/institutional softwares are as follows:

- DSpace:

DSpace is one of the first OSS platforms to store, manage and distribute the collections in digital format. DSpace is the favourite software for academic, non profit and commercial organizations. DSpace preserves and enables easy and open access to all types of digital contents including text, images, moving images, mpegs, data sets, etc. This software is the digital repository system that captures, stores, indexes, preserves and distributes digital research material and this software is being upgraded time to time according to the users need.

- Green stone:

The Greenstone digital library software is an open-source system for the construction and presentation of information collections. It builds collections with effective full-text searching and metadata-based browsing facilities that are attractive and easy to use.

Content Management Software:

- Joomla:

Joomla is one of the most effective Content Management Systems. It is easy to install, simple to manage, reliable, open source, free and offers the perfect balance of power, flexibility and ease of use.

- Drupal:

Drupal is used to make many of the websites and applications. It has standard features, easy content authoring, reliable performance, and excellent security. It is flexible and helps us to build the versatile, structured content that is needed.

The Drupal project is open source software and anyone can download, use, work on, and share it with others. It is based on principles like collaboration, globalism and innovation. It has no licensing fees and free for all [4].

5. Role of Libraries:

The libraries can adopt open source softwares for in-house operations which is beneficial for Indian libraries. Libraries can take advantage of the reduced costs the cloud offered by reducing local support and hosting costs by the vendor. Open source softwares are sustainable in nature that makes it more reliable for libraries. Libraries have a chance to update the software according to their functional needs. The libraries associated with the higher education system can become rich in terms of the library solutions available and in terms of collaboration and sharing between libraries. Libraries can collaborate and share code on the functionality. These developments include: open (linked) data; managing research data; open scholarship and science; open content for example OERs, crowdsourcing, and open access [5].

6. Conclusion:

The libraries are slowly moving towards purchasing the open source softwares which is cost effective, sustainable, and cooperative in nature. This type of software is being constantly updated and tries to meet the libraries' need. Libraries should promote the open source software selection in comparison to proprietary softwares. Halton Borough Council was the first to adopt open source for its public libraries and the University of Staffordshire was the first UK University to adopt an open source management system. In this these libraries motivated others towards adopting the Open Source Software solutions. This movement of adoption of open source software should be speeded up and there is need to make awareness among

libraries after seeing the thousands of benefits of these softwares.

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Use of Internet by Political Science Department Students in Gulbarga University Kalaburgi: A Study

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Abstract: The article deals about use of internet by Political Science Dept. Of Gulbarga University, Kalaburgi (Karnataka State). There are 96 students studying in the Department, out of that surveyed 74 students which accounts 77.08% of the users. Further, It deals about, Objectives of the study, Statement of the problem, Methodology of the study, Review of Literature, Brief information about University, Data Analysis and interpretation of the study. At end it deals about findings of the study and makes some suggestions for improvement of the study.

1. Introduction:

The Internet is a world Wide network of computer networks. It links millions of computer around the world; it is used for many diverse and ever growing purpose. It has become a must powerful dynamic tool for information level. It is no longer, the provenience of computer specialist alone. It is everywhere every to send and received emails. Someone may use it to read their preferred newspapers/ magazine or browse through websites. Some may perhaps use it to cricket scores or play an on line chess game. And some may shop on net. Sooner or later, every one of us will not only be using the internet but also be developing an urgent need for it. The internet offers access to unthinkably large amount of information, data and interpretative materials in a timely, cost-effective ad comfortable manner: it delivers better, faster timely communication with users and colleagues.

Internet has revolutionized the world of information. It is one of the two technological innovations that have greatly influence the development of communication strategies and practices in both the general and the business communities of the world. The first was the invention of printing press, Gutenberg's invention served to democratize the possession and transmission of texts, made the production of books much easier and cheaper than the manuscripts method it replaced. The internet provides new horizons for the researchers. A potentially vast population of all kinds of individuals and groups may be more easily reached

than ever before, across geographical borders.

2. Objectives:

1. To understand the use of internet technology by students
2. To identify the purpose for using the internet by students
3. To identify the use of internet frequency by students
4. To motivate the students use of Internet
5. To know the time spent in use of Internet
6. To know the level of satisfaction towards internet
7. To understand the difficulties faced by users in using internet.

Statement of the Problem:

The study is restricted to students of political science, Gulbarga University, Kalaburgi in the **"use of internet in Political Science Department Students, Gulbarga University, Kalaburgi: Study"**

Methodology:

The questionnaire method has been adopted for collecting research data from the Internet user of political science department IV semester Students 2015, which has been distributed 96 questionnaire, out of which 74 filled in questionnaire received back which accounts 77.08%.

Literature Review:

There is more number of Articles published on use of Internet but here some of them have given below: The study by **Luambano and Julita (2004)** revealed that the level of students' access to the internet was low, and the major reason is that computers with internet facilities were inadequate. The findings also revealed that the students who had access to the internet were not using it efficiently. They used it mainly for communication with friends and relatives more than for academic purposes. The study by Niran Opeyemisodipe (2013) majority of the users used for social networking, checking of information, instant messaging and e-mails. Further, 70% of respondents are frequently use for their devices for internet activities

3. Gulbarga University and Department of Political Science, Kalaburgi: An Overview

- It was earlier a P.G Centre of Karnataka University up to 1970 and inde-

pendently established on 10th September 1980. The university has been catering to the needs of Higher Education in Hyderabad Karnataka region of Karnataka State which is considered as a developing region through teaching, research and extinction programmes. It is a State University established as per the provision of the karnataka, it has the jurisdiction of Districts viz. Kalaburgi, Bidar, Raichur and Yadgir. It has a main campus at kalaburgi and has Three P.G Centres: one each at Raichur and another at Halahalli Bidar, and another at Basavakalyan i.e SharanaSahitya Library and Resource Centre. The university have affiliated 307 colleges and caters to the needs of all sections of the society and promotes co-education. The University has six faculties viz. Arts, Commerce, Education, Social Sciences, Science, Science and Technology and Law, Consisting of 37 Departments of Post-Graduate Studies and Research on the main campus and P.G Centres. The University promotes research projects studies leading to research degrees. The Department of Political Science was established in the year 1937 when University was P.G centre at K.U.D, this course is also offered at P.G centre, Bidar and Govt. Degree College, Kalaburgi, Raichur, Sedam, Shahapur, Yadagir, Sindhanur and Maski in Raichur District. To cope with the advances in the field of Political Science, the syllabus is updated every three years. Emphasis has been given to the latest development across the globe. The syllabus is framed and taught according to CBCS ad CAGP from the academic year 2011-12.

Data Analysis and Interpretation:

Table – 1: Use of Internet by students

Sl. No.	Where do you get access to internet service	Response	Percentage
1.	**Department**	**00**	**0%**
2.	Centre Computer Centre	12	16.21%
3.	University Library	59	79.72%
4.	At home	2	2.70%
5.	Private browsing centre	1	1.35%

The above table indicates that the use of Internet at different centre it reveals that 16.21% of respondent use Internet in central computer centre. 79.72% student's use internet in University Library. 1.35 % (1) indicates that use of Internet in private browsing centres.

Table – 2:

Use of Internet Frequency by students

Sl. No.	Frequency use of Internet	Response	Percentage
1.	Daily	38	51.35%
2.	Weekly	29	39.00%
3.	Monthly	07	9.45%
4.	Yearly	00	00%
5.	Never	00	00%
	Total	74	100%

Above table indicates that 51.35% response use the internet frequency daily, further it indicates 30.00 % of respondents indicates that they are using daily Internet, remaining 9.45 % of respondents are using internet monthly.

Table – 3:

Purpose of using Internet

Sl.No.	Purpose of using Internet	No. Of Respondents	Percentage
1.	Exchange of information	31	41.89%
2.	Sending manuscripts for publication articles	12	16.31%
3.	Personal common/E-mail	08	10.81%
4.	For browsing and downloading concerned related articles	16	21.62%
5.	Keeping Update Knowledge	04	5.40%
6.	Home assessment	00	00.00%
7.	For course related information	00	00.00%
8.	Inter Library loan request	00	00.00%
9.	Getting photo copies of documents	02	2.70%
10.	Getting manuscripts from publisher	00	00.00%
11.	Non of Use	01	1.35%

The survey indicates that 41.89 % (31) of respondents use Internet.16.31% (12) Survey indicates that using internet for sending manuscript for publication of articles purpose. 10.81% of respondents using internet for sending e-mail purpose. 21.62%

(16) of respondents using internet for downloading related articles purpose. 5.40% (4) of respondents using internet for keeping update knowledge purpose. 2.70% and 1.35% of respondents using internet for photocopies of documents purpose.

Table – 4: Motivation for using Internet

Sl. No.	Motivation to use of Internet	Response	Percentage
1.	Enhancing Internet band – width	40	54.06%
2.	Emphasis on quality	13	28.23%
3.	Central facilities at the institution	07	9.45%
4.	To conduct training/awareness program for faculty and students	14	18.90%

The study reveals that 54.06% (40) of respondents motivated to increase band width of internet for good use. The study reveals that 28.23% (13) of respondents are emphasis on quality of internet. 18.90% (14) of respondents says that Librarian should conduct in house training in library to use of internet.

Table – 5: Time spent in Use of Internet by respondents.

Sl. No.	Internet of subject related activities	**Response**	**Percentage**
1.	Less than 2 Hours	23	31.08%
2.	2-4 hour	37	45.91%
3.	5-7 hours	12	16.01%
4.	More than 7 hours	02	2.10%
5.	Not used by users	00	00%
	Total	74	100%

The above table indicates that 45.91% (37) respondents used Internet between 2-4 hours in Library internet centre in different subjects. 31.08% (23) of respondents used in internet less than 2 hours. Remaining 16.01% (12) and 2.10% (2) 0f respondents use internet between 5-7 hours and more than 7 hours respectively.

Table – 6: Need Advanced Internet Training

Sl. No.	**Internet Training Necessary**	**Response**	**Percentage**
1.	Yes	59	79.73%
2.	No	15	20.27%
	Total	74	100%

The study reveals that 79.73% (59) of respondents need advanced internet training. 20.27% (15) of respondents do not need advanced training in internet.

Table – 7:

Method of acquiring Internet skills

Sl. No.	Acquried internet skills	**Response**	**Percentage**
1.	Computer Centre	18	24.32%
2.	Library Staff	16	21.62%
3.	Colleagues	00	00
4.	Friends	40	54.06%
	Total	74	100%

The study indicates that 54.06% (4)0) of respondents have acquired internet skills by friends. The study indicates that 24.32% (18) and 21.62% (16) of respondents have acquired internet skills by central computer centre and Library staff.

Table – 8: Satisfaction with existing facility

Sl. No.	Internet Facility	Response	Percentage
1.	Satisfied	28	37.83%
2.	Not Satisfied	46	62.17%
	Total	74	100%

The study reveals that 37.83% (28) of respondents are satisfied with existing facilities, but remaining 62.17% (46) of respondents are not satisfied with existing facilities.

4. Findings :

- More number of users are not purchased the computer laptop but they are using Internet in University Library.
- More number of users should use internet daily.
- Only 5.40% of users internet for keeping update knowledge purpose.
- 18.90% of respondents required motivation to Training/ Awareness programme for faculty and students.
- Only 2.10 % of respondents spent time in internet centre.
- 79.75% of respondents need Advanced Training in Internet.
- 54.06% of respondents acquired internet skills by friends.

- 62.17% of respondents not satisfied with existing facilities available in library.

5. Suggestions :

- More number of users should purchase laptops /computers to use internet in the home.
- 100% of respondents should use internet daily.
- More number of students should use internet for exchange of information and downloading subject related articles.
- 100% of respondents need Training/Awareness Programme.
- More number of users should spent time in Internet centre.
- Library staff should motivate to the users to acquire the internet Skills.
- Library and computer centre should provide sufficient facilities to the users.

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Use of Internet by the Faculty Members of Polytechnic Colleges in Yadagir District: A Study

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Abstract: *This article explains the Use of Internet by the Faculty Members of* ***Polytechnic Colleges in Yadagir District:****. In recent years more and more information has been made available on the web. High quality information is often stored in dedicated databases of digital libraries, which are on their way to become expanding islands of well organized information. However, managing this information still poses challenge. The Internet provides technologies that are about help to meet these challenges and require the right information. The Polytechnic Faculty Members use the Internet are Frequency of Library Usage are daily (81.80%), hours spending in Internet from library are 3-4 Hours (52.40%), on the basis of mode of learning the Internet are Self Learning (70.30%) and preferring on-line teaching and learning are high level (52.90%).*

Keywords: Internet, Electronic Resources, Polytechnic College and Faculty Members

1. Introduction

Information and knowledge can be acquired in many ways through experience and observation of external phenomena, through self study, through formal education and academic infrastructure, through research and experiment. The most important and central aid in the process of education whether formal or informal

is the Library, academic, special or public, each type catering to particular groups of people with specific interests and information needs and requirements. Libraries serve people from all walks of life and involved in all types of activity – right from those connected with governing and shaping national destiny and these inventing or discovering something new in science or technology or industry which changes its course, to those who are preparing themselves to enter their chosen fields and professions and who require to go through the many years of formal study that will bring them to that point.

Polytechnic education is important tools that builds and encourages scientific temper, professional skills and moulds young minds to study, ponder and achieve. Students require sound foundation courses through which appropriate skills and knowledge can be acquired and for this adequate information support needs to be provided. The polytechnic institute which provides professional education at a certain basic level must also ensure sufficient information provision to its students.

2. Review of Literature

Bolarinwa, A.J (2014) carried out a study on " Internet Use by Academic Staff of Rufus Giwa Polytechnic, Owo and Ondo State, Nigria". With the evolution of media, Information and Communication Technology globally. Internet has been a major tool in academic activities. To this end, this study was carried out to evaluate the Internet use by academic staff of **Rufus Giwa Polytechnic, Owo, Ondo State, Nigeria.** A total number of 100 copies of structured questionnaire were administered out of which 81 were retrieved. Data generated from the respondent was analyzed using frequency count and percentile. The analysis of the data revealed a positive indication on the usage of Internet do not have access to Internet facilities in their respective offices as well as inadequate training on Internet search knowledge.

Selvi, S and Dhanavandan, S (2012) revealed on " A Study on Utilization of Internet Resources and Tools by Basic Medical Science Professionals". This study is aimed to examine the utilization of internet resources and tools by basic medical science professional studying in the University of Madras. Questionnaire method was adopted to collect the data followed by post graduate students and research scholar. The data collected was analyzed and inferences made based on standard statistical methods. The study indicates 48 percent of the respondents using it internet everyday 23.11 of them once in a week. And it show the 97.77 percent of the respondent's use the internet for gathering information and 94.22 percent of the respondents were use the Google, 70.22

percent of the respondents were use the yahoo search engine.

3. Objectives of the Study

The study has been designed with the following objectives:

- To study the Use of Internet by the Faculty members of Polytechnic colleges in Yadagir District
- To identify Distribution of Gender
- To identify the distribution of Age
- To investigate the distribution of Designation
- To distribution of Frequency of Library Usage
- To measure the distribution of respondents on the basis of hours spending in Internet (in hour) from library
- To indicate the distribution of respondents on the basis of mode of learning the Internet and
- To identify the respondents level of preferring on-line teaching and learning.

4. Methodology

The Questionnaires were used to evaluate Polytechnic Faculty member's familiarity with use of Internet and related resources. The Questionnaire specified that the survey is for faculty members and included a brief description of the survey and estimates that it will take approximately 15 minutes to complete. The information sheet followed a question and answer format to provide participants with information about research studies in general and this study in particular.

Data Analysis

Table . 1 Distribution of the Sample

S.No.	Designation	No. of Questionnaire Distributed	No.of Questionnaire Responded	Percentage
1	Lecturer	400	382	66.80
2	Sr. Lecturer	150	127	22.20
3	HOD	75	63	11.00
	Total	625	572	91.52

Table 1 indicates the distribution of the sample. It is inferred from the survey of 625 questionnaires distributed, 572 questionnaires responded. The sample wise responses i are 91.52 percentages.

Table 2 Distribution of Gender

S.No.	Gender	Number of Respondents	Percentages
1	Male	365	63.80
2	Female	207	36.20
	Total	572	100.00

The above table shows the gender wise distribution. It is inferred from the survey that 63.80% of the respondents are male and 36.20% of the respondents are female. So majority of the respondents are male.

Table 3 Age Wise Distribution

S.No.	Age	No.of Respondents	Percentage
1	36-45	217	37.90
2	25-35	208	36.40
3	46-55	116	20.30
4	Above 55	31	5.40
Total		572	100.00

Table 3 explains the details of age wise classification. It is observed from the table that 37.9% of the respondents are 35-45 years of age, 36.4% of the respondents are 25-35 years of age, 20.3% of the respondents are 45-55 years of age and 5.4% of the respondents are above 55 years of age. So majority of the respondents are in the age group of 25-45 years of age group.

Table 4 Designation Wise Distribution

S.No.	Designation	No. of Respondents	Percentage
1	Lecturer	382	66.80
2	Senior Lecturer	127	22.20
3	HOD	63	11.00

Total		572	100.00

Table 4 reveals designation wise classifications. It is exhibited from the table that 66.8% of the respondents are lecturers, 22.20% of the respondents are Sr. Lecturers and 11.00% of the respondents are HOD. It could be seen clearly from the above discussion that majority of the respondents are lecturers.

Table 5 Distribution of Frequency of Library Usage

S.No.	Frequency of Library Use	No.of Respondents	Percentage
1	Daily	465	81.80
2	Once in a week	19	3.30
3	Once in a month	67	11.70
4	As all when required	19	3.30
5	Once in a fortnight	2	0.30
Total		572	100.00

It is inferred from the above table that 81.80% of the respondents used the library daily, 11.70% of the respondents used the library once in a month followed by 3.30% of the respondents used the library once in a week, 3.30% of the respondents used library when required and once in a fortnight. Majority of the Faculty members used library daily. It is clearly from the above table majority of them used the library daily.

Table 6 Distribution of Respondents on the Basis of Hours Spending in Internet (in hours) from Library

S.No.	Hours spending in Internet	No.of Respondents	Percentage
1	3-4 hours	300	52.40
2	2-3 hours	148	25.90
3	4-5 hours	61	10.70
4	Less than 2 hours	60	10.50
5	More than 5 hours	3	0.50
Total		572	100.00

It is inferred from the table that 52.4% of the respondents are spending 3-4 hours, 25.90% of the respondents are spending 2-3 hours, 10.70% of the respondents are spending 4-5 hours, 10.50% of the respondents are spending less than 2 hours and only 0.50% of the respondents are spending more than 5 hours for surfing Internet.

So based on the result it could be seen clearly that more than 50.00% of the respondents are spending 3-4 hours to access internet from library.

Table 7 Distribution of Respondents on the Basis of mode of Learning the Internet

S.No.	Mode of learning Internet	No. of Respondents	Percentage
1	Self learning	402	70.30
2	From faculty and friends	109	19.10
3	Training courses from experts	61	10.60
Total		572	100.00

Table 7 indicates that on the basis of mode of learning of internet ,70.30% of the respondents are self learning. 19.1% of the respondents are learning from faculty and friends and 10.6% of the respondents are learning from training courses and exports.

So it could be seen clearly from the above discussion more than 70% of the respondents are learning internet from self learning.

Table 8 Distribution of Preferring on-line Teaching and Learning

S.No.	On-line teaching and learning	No. of Respondents	Percentage
1	High	298	52.90
2	Moderate	225	39.00
3	Low	49	8.00
Total		572	100.00

Table 8 explains that distribution of preference for on-line teaching and learning level is very high ie. 298 (52.90%), followed by Moderate level 225 (39.00%) and low level 49 (8.00%).

5. Conclusion

In recent years development in the Information and Communication technologies has spurred the connection of Internet and Computers. Its used primarily for teaching, learning, personal and recreational purposes. The power and reach of the Internet has reached Polytechnic Faculty Members effectively in both educational learning and knowledge-oriented applications.

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USE OF INTERNET RESOURCES BY THE RESEARCH SCHOLARS OF SCIENCE DEPARTMENTS IN KARNATAK UNIVERSITY, DHARWAD: A SURVEY

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Abstract: The study is designed to explore the patterns of Internet use by the research Scholar including purposes for use, its impact on research, Internet resources that they use, and the problems faced while accessing the Internet. Questionnaire method used to collect data, totally 100 questionnaires was distributed out of which 90 questionnaires received back with response rate of 90%. The study found that male respondents dominate over female respondents in using Internet, majority of the scholars' access Internet in their respective department and they use to access E- journals.

1. Introduction

The Internet is a "network of networks" that consists of millions of smaller domestic, academic, business, and government networks. Internet is also described as the worldwide publicly accessible network of interconnected computer networks that transmit data by packet switching using the standard Internet Protocol (IP). Since last couple of years Internet has become a global source of information resources accessible at anytime by anyone from anywhere in the world. It has converted the whole world into a global information society. It has tremendously improved communication and interaction among scientific research community and enabled them to access a vast range of latest information. It acts as a powerful supplement to the traditional way of information access. It facilitates electronic and exchange of ideas and collaboration among the scholars all over the world.

Academic libraries have made a significant investment in electronic information resources and computer based technologies in general and the Internet in particular as a need on the part of librarians to provide technology mediated information services to the clientele. In a limited span of time, the Internet has become an integral unit for library and information centers. The present study is conducted to measure and to identify the changing users' attitude, and behavior towards the Internet. It is necessary to examine the Internet facility provided at to university campus and evaluate the use of Internet by the students of different disciplines on the campus and particularly Research scholars of science departments.

2. Objectives of the Study

The present study is an attempt to collect opinion from the Research Scholars of Science Departments in Karnatak University, Dharwad.

- To find out the frequency of use of Internet resources;
- To discover the purpose of use of Internet;
- To know the most frequently used search engines and websites by the users;
- To know the Impact of Internet on Study/ Project Work;
- To find out the problems faced by the users while accessing Internet service.

3. Methodology

For the purpose of the collection of data for this study the questionnaire method was adopted. A well structured questionnaire was designed for Research Scholars of Science Departments of Karnatak University, Dharwad, while covering all the important aspects. However the objectives stated above will also be kept in mind during designing of questionnaire.

4. Results and Discussions

Sex wise distribution of Scholars

The table 1 reveals that gender-wise distribution of respondents of the total 90 respondents surveyed, 58 (64.44%) are male and 32 (35.56%) respondents are female. It can be inferred from the study that male respondents are more responsive than female respondents.

Table -1 Sex Wise Distribution of Scholars

Sex	No. of Scholars	Percentage (%)
Male	58	64.44%
Female	32	35.56%
Total	**90**	**100%**

Place of Internet Access

It is found from the study that, the majority of the Respondents access Internet from their respective Department Computer Laboratory, that is 58 (64.44%) and 32 (35.56%) of the Respondents access the Internet from home, 28 (31.11%) of the respondents access the Internet from Cyber Cafe, 18 (20%) of the respondents browse the Internet from University Computer Laboratory and 3 (3.33%) of the Respondents browse the Internet from Central Library.

Table 2: Internet Access Point

Browsing Place	No, of Respondents	Percentage (%)
Department Computer Laboratory	58	64.44%
University Computer Laboratory	18	20%
Cyber Cafe	28	31.11%
Home	32	35.56%
Central Library	03	3.33%
	N=90	

5. Frequency of Internet Usage

A study reveals that 76 (84.44%) respondents accessing Internet regularly i.e. daily and 14 (15.56%) of the respondents accessing Internet more than once a day. This shows that, Internet is a most popular information source used by the Science research scholars. It is very much helpful to Scholars.

Table 3 Frequency of Internet Usage

Internet Usage	No. of Scholars	Percentage (%)
Every Day	76	84.44%
More than once a day	14	15.56%
Once a week	00	00%
Once a month	00	00%
Less than once a month	00	00%
Total	**90**	**100%**

6. Purpose of Using Internet

The respondents were asked to give opinion on their purpose of using the Internet. The data presented in table 4 examines that, 63 (70.00%) of the respondents using Internet to access the E-Journals followed by 44 (48.89%) of respondents using the Internet for communication purpose i.e. E-Mail and 33 (36.67%) respondents uses Internet for general purpose and only 22 (24.44%) respondents said that they access the Internet for Entertainment purpose.

Table 4 Purpose of Using Internet

Purpose	No. of Scholars	Percentage (%)
E-mail	44	48.89%
Browse E-journals	63	70.00%
Entertainment	22	24.44%
General purpose	33	36.67%
	N=90	

Types of Information Search through Internet

Below table 5 reveals that, 30 (33.33%) Scholars opines that they use Internet to search for research related information, while 24 (26.67%) of the scholars for General Knowledge, and for Updating Current Information 23 (25.56%), and for Job Related Information 13 (14.44%).

Table 5 : Types of information search through Internet

Types of In Formations	No. of Scholars	Percentage (%)
Research Topic Related	30	33.33%
General Knowledge	24	26.67%
Updating Current Information	23	25.56%
Job Related Information	13	14.44%
Total	**90**	**100%**

Search Engines Preferred

It is observed from the table 6 that, 81 (90.00%) of Scholars use Google followed by 63 (70.00%) use Yahoo, 02 (02.22%) of AltaVista, 01 (01.11%) use Lycos and MSN search Engines.

Table 6 Search Engines Preferred

Search Engines	No. of Scholars	Percentage (%)
Alta Vista	02	02.22%
Google	81	90.00%
Lycos	01	01.11%
MSN search	01	01.11%
Yahoo	63	70.00%
Any other	-	-
	N=90	

7. Opinion of users about their Satisfaction with the Internet.

Research Scholars were asked to opine about their satisfaction level on Internet, more than half of the users i.e. 54 (60%) of users are Moderately Satisfied, 12 (13.33%) of them are Very Satisfied with Internet facility, 13 (14.44%) of Scholars are Satisfied, and 11 (12.22%) dissatisfied with the Internet facility.

Table 7 Opinion of Users about their Satisfaction with the Internet Services

Internet Satisfaction	No. of Respondents	Percentage (%)
Very Satisfied	12	13.33%
Satisfied	13	14.44%
Moderately Satisfied	54	60%
Dissatisfied	11	12.22%
Total	**90**	**100%**

8. Impact of Internet on Study/ Project Work

Respondents were asked to opine about the impact of Internet on their Study/ Project work. It is evident from the study that, majority i.e. 65 (72.22%) of the scholars are agree that the Internet has an impact on their Study/Project work. About 18 (20.00%) of the Scholars opines that they are Strongly Agree, 7 (7.78%) Scholars opines they are Uncertain, 3 (3.33%) of the Scholars are Disagree with this.

Table 8 Impact of Internet on Study/ Project Work

Impact of Internet on Study/ Project Work	No. of Respondents	Percentage (%)
Strongly Agree	18	20.00%
Agree	65	72.22%
Uncertain	07	7.78%
Disagree	00	0.00%
Strongly Disagree	0	00%
	N=90	

Problems Faced by Users to Access the Internet

The table 9 depicts the problems faced by the research Scholars in surfing the Internet. The majority 28 (31.11) of Scholars find it Slow Internet Access, and 24 (26.67%) find it overload of information on Internet, 15 (16.67%) of the scholars feels

it Privacy Problem while 13 (14.44%) of scholars says it Difficult on findings relevant information,

Table 9 Problems Faced by Users to Access the Internet

Problems	No. of Scholars	Percentage (%)
Slow Internet Access	28	31.11%
Overload of information on Internet	24	26.67%
Privacy Problem	15	16.67%
Difficult on findings relevant information	13	14.44%
It take longtime to download information	10	11.11%
Lack of E-Mail Facility	00	00%
Total	**90**	**100%**

9. Conclusion

Internet is a vast ocean of information related to almost all subjects. The present study examines that all the research scholars use Internet as their sources of information. The study also examines that the majority of the users are satisfied with the information available on Internet. It has been established that Internet serves as an important tool in the world of information. However, to utilize the resources of Internet to its maximum, it is necessary to make the research scholars well-versed in the surfing and browsing on the Net.

From the analysis, the study suggests that there is a need to make research scholar aware of the advantages of the Internet, also to conduct orientation on how to use Internet more effectively and efficiently. Hence it is suggested that the concerned authority must conduct orientation programme and make it mandatory to all the research scholars to attend the same. The concerned authority need to improve the Internet facility and more number of computer systems should be allocated in the departments for Internet use because the study found that majority of scholars use Internet in respective departments with fast access speed.

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Web Scale Discovery: Way for Transforming Access to Library Resources

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Abstract: Libraries have a strategic interest in the modern technologies that enable the discovery of and access to the information resources for the communities that they serve. These technologies are steadily growing over recent times, making great strides in the scope and depth of library resources addressed and in providing library users' even more convenient ways to access different resources. Web scale discovery (WSD) for the libraries has the capabilities to more easily connect users with the library's vast information repository. This includes locally hosted content, such as physical reading materials, CDs / DVDs, digital collections, and local institutional repositories. This paper provides an overview of the current resource discovery environment, its features, advantages and disadvantages and further discusses some of the major identified web scale discovery tools (WSD) and its implantation in some libraries.

Keywords: Web Scale Discovery, Discovery Tools, Next-Generation Cataloguing, Indexes

1. Introduction:

Libraries have a strategic interest in the modern technologies that enable the discovery of and access to the information resources for the communities that they serve. These technologies are steadily growing over recent times, making great strides in the scope and depth of library resources addressed and in providing library users' even more convenient ways to access different resources. The progress observed in the continual generations of technology beginning from online catalogues, to meta-search tools, to the current generation of index-based discovery services represents an enormous change. Yet many gaps remain to the potential of wider access to the universe of knowledge and content of interest to libraries and their users.

Discovery is vital to the success of any library and its users in the current digital environment. Even the updated and complete available authentic information is useless, if users are unable to find the required scholarly content. As the discovery process has moved operational online, the libraries, vendors and technologies have worked together to develop a tool that is easy and effective for far-reaching library users. Most recently, many libraries in developed countries have implemented web-scale discovery services that allow users quickly and easily search across a wider range of information resources including articles' databases, newspaper clippings, e-books, electronic data-

bases, institutional repositories, and the local catalogues. However, such tools may be unfeasible for many libraries still in India due to its budget restrictions. Even though some libraries have recognized the importance of WSD and adopted this service by other ways and improved discovery and research for their users.

This paper provides an overview of the current resource discovery environment, its features, advantages and disadvantages and further discusses some of the major identified Web scale discovery services (WSD) and its implantation in several libraries. This paper does not provide any comparison of available products, but to observe that this product genre continues to experience significant momentum in its development path.

2. Web Scale Discovery:

Connecting users with the information they need is one of the prime object of our profession. Web scale discovery can be considered as an option to fulfill this object as a deep discovery within a vast ocean of content. While there are various approaches to Web scale discovery, this chapter focuses on what today appears to be the most common, which involves huge, centralized, pre-aggregated indexes searched by the end user. Further, Web scale discovery is certainly holds the potential to be-the evolution that libraries have long sought for information discovery. As LIS professionals, we all have at least a general awareness of the evolution of web scale discovery tools within the library context. Such tools initially were print-based, such as handwritten card catalogues, Ulrichs International Periodicals directory and the Reader's Guide to Periodical Literature. For the past several generations, such tools gradually transferred into the automated and electronic form, and the development of online integrated library system (ILS) with a front-end catalogues accessible to librarians and end users. These catalogues were initially available within the local library's physical building, often through a menu-driven, text-based interfaces and HTTP Web-based online catalogues. Other evolutions included early pioneers in broad online information systems, including Dialog and LexisNexis. The 1990s ushered in growth in publisher-based electronic journal content, e-text and e-book content, abstracting and indexing databases, and full-text content aggregators looking to pull related information together within an easily accessible and searchable electronic medium. Many of these services or products were initially provided on CD-ROM or through text-based, menu-driven networked systems, which all finally evolved into information search and delivery through a Web-based environment.

During mid-1990s, many of us witnessed the confusion raised by many end users faced with the choice of numerous information systems with multiple interfaces

and specialized bodies of content. At the same time, new search engines developed by Infoseek, Altavista, Lycos, Webcrawler, Yahoo search, Hotbot, ask.com and google, which would often be the first stop-and gateways to information discovery - for a new generation users. Back in the library and academic environment, other information discovery and delivery systems (often separate from the ILS) were developed, such as institutional repositories (IR), content management systems (CMS), electronic reserves, knowledge management systems (KMS) and digital libraries. These systems provided additional value for hosting, discovering, and delivering services to end library users. Library and information centers have developed and marketed federated search solutions, which attempted, with mixed (limited) success, to simultaneously search, retrieve, and adequately display content from various remote information hosts-such as abstracting and indexing and full-text databases-and were often difficult or time-consuming to configure and maintain. In a sense, the original federated search technologies, depend on protocols such as Z39.50; denote an early approach to web scale discovery of content at the article-citation and full-text levels. In the mid - to late 2000s, library Web catalogues evolved into "next-generation" library catalogues with many features such as faceted navigation, tag clouds, user interfaces and Web 2.0 social features offering increased intuitive functionality. These next-generation catalogues also provided the capacity to harvest records from various locally hosted library servers of information – i.e., catalogue records from one host and digital collection records from another host - with search, retrieval, and presentation of the collective results from within the single interface. In many cases, these next-generation catalogues are still in state of the art position for many libraries.

Web scale discovery (WSD) for the libraries has the capabilities to more easily connect users with the library's vast information repository. This includes locally hosted content, such as physical reading materials, CDs / DVDs, digital collections, and local institutional repositories. Perhaps more essentially, web scale discovery also accesses a huge range of remotely hosted content, often purchased or licensed by the library, such as publisher and aggregator content of e-books and full-text journals, supplementary content from abstracting and indexing resources, and content from open access scholarly resources.

The current discovery environment in the LIS field is dominated by a set of products within the genre of index-based discovery services, often marketed as "web-scale discovery services," which rely on a large central index populated by metadata, full text, or other representations of the content items in a library's collection. These indexes are a component of a multi-tenant platform consists of search and retrieval technology components, and an end-user interface. The platform may also expose APIs that allow programmatic access to the search and retrieval functionality of the platform that bypasses the provided interface. It exists as part of the ecosystem of scholarly and

popular publishing, abstracting and indexing services, and in the information infrastructure of the libraries that adopt them.

We librarians are aware with the single-line form, the consolidated index, which represents a very large portion of a library's print and online collection. Our library users too certainly need to be familiar with the idea of a single search across a comprehensive index that produces a large, relevancy-ranked results list as output. Even though most of the library users would not understand the term web-scale discovery (WSD), it is what they have come to expect. More libraries are implementing WSD services in order to fulfill their users' needs. The LIS professionals, who are not aware with the WSD, should learn now how web-scale discovery work, evaluate its services, and then guide the users all about it.

3. Defining Web Scale Discovery:

"Web scale discovery" refers to a class of products that index a vast number of resources in a wide variety formats and allow users to search for content in the physical collection, print and electronic journal collections, and other resources from a single search box. Search results are displayed in a manner similar to internet searches, in a relevance ranked list with links to online content.

Vaughan describes web scale discovery as "a service capable of searching across a vast range of pre-harvested and indexed content quickly and seamlessly."

Wisniewski humorously describes web scale discovery in the following way: "If a next-generation OPAC, a federated search engine, and all of your full-text databases had a baby, that baby would be web scale discovery."

Hoeppner provides a concise and clear working definition: "a pre-harvested central index coupled with a richly featured discovery layer providing a single search across a library's local, open access, and subscription collections."

The above definitions cover the core idea of web scale discovery (WSD) as a large, vendor supplied index of all kinds of materials coupled with a simple interface, giving users the ability to search across a library's entire collection simply. These services provide results in a relevance-ranked, united list of print, online, and multimedia content. Web scale discovery services provide discovery and delivery services that often have the following features:

1) **Central index:** The collection of pre-harvested and processed metadata and full text that comprises the searchable content of a WSD service: Central indexes typically include full text and citations from publishers; full text and metadata from

open source collections; full text, abstracting, and indexing from aggregators and subscription databases; and MARC from library catalogues; also called the base index, unified index, or foundation index. A web-scale discovery central index is very large relative to library databases of the past. Normally, vendor sites give some statistics that illustrate the size, scope and depth of central index. Size alone is not sufficient to evaluate a central index. Scope of the content, item types, inclusion of the full text, and richness of the metadata are all important aspects. To best serve the library, the central index should align with both the library's available content (i.e., the books, databases, and full text) and the approach to research appropriate for its users.

2) **Content:** The WSD harvest content from local and remotely hosted repositories and create a vastly comprehensive centralized index to the article level-based on a normalized schema across content types, well suited for rapid search and retrieval of results ranked by relevancy. Content is enabled through the harvesting of local library resources, combined with brokered agreements with publishers and aggregators allowing access to their metadata and/or full-text content for indexing purposes. The content from a variety of sources are article-level scholarly content from proprietary and open access sources local resources. The content for these resources is harvested from a variety of sources including the institution's integrated library system, archival materials, digital collections, electronic resources or institutional repositories including electronic theses and dissertations. These resources may need to be segregated in the indexes so that they are seen primarily by their own institution and not others that may be customers of a multitenant discovery service. Content in a central index may include any or all of the following types:

a) **Library supplied data:** Includes MARC and metadata from local digitized collections and institutional repositories. As part of the initial service configuration, the library may provide a complete file (or files) of the MARC, work with the service to map MARC fields to the preferred record format of the WSD vendor, identify library locations, and otherwise integrate the catalogues data into the central index. Metadata from digitized collections and institutional repository content are often harvested using OAI-PMH. The library can set the frequency of MARC and OAI-PMH updates.

b) **Open access and public domain data:** This includes citation metadata, indexing and abstracts, and full text from open collections and indexes.

c) **Publisher metadata and full text:** includes citation metadata, author-supplied

abstracts and keywords, and full text of documents. Many online journal and book publishers supply the full text of articles and chapters so this material can be *searched,* but the full text can only be displayed or downloaded, if the library has rights to the content.

d) **WSD-licensed material:** WSD vendors actively pursue agreements with aggregators and other content providers to include content that would interest libraries and enrich the central index. For example, all major WSDs harvest some content from LexisNexis, Gale, Credo Reference and part of Cengage Learning. The exact deals between WSD services and database vendors are not uniform and are subject to change. Some of the database vendors are also WSD competitors. Not surprisingly, the databases owned by one vendor typically don't appear in the central indexes of its competitors.

e) **Mutually licensed:** Some metadata will be loaded into the central index but can be searched and/or viewed only if the library has a subscription to the source database.

3) **Discovery:** These services have a single search box providing a Google-like search experience (as well as advanced searching capabilities). The user interface and search system for discovering, displaying, and interacting with the content in library systems, such as a WSD central index: Discovery layers are not new to librarians or unique to WSD services.

Common features of discovery layers for web-scale discovery services include the following:

- Single search across the central index
- Fast response time
- Relevancy-ranked results list
- Facets, sort, and other tools for refining and using the results
- Connections to full text via direct links and OpenURL
- End-user accounts and features

4) **Delivery:** provide a quick results ranked by relevancy in a modern interface offering functionality and design cues intuitive to and expected by dynamic and tech-savvy users (such as faceted navigation to drill down to more specific

results).

5) **Flexibility:** These services are agnostic to underlying systems, whether hosted by the library or hosted remotely by content providers. These services are open compared to traditional library systems and allow library greater latitude to customize the services and make the service its own.

6) **Interface:** User interface is the front end screen of the Web scale Discovery service. Interface is often hosted by the vendor, but some vendors allow for local hosting of the interface, but the content index is always remotely hosted on cloud servers. Users do search the index and get results though the web interface.

So, in brief, the central index is content, and the discovery layer is the interface. The vendors typically license the two halves as a unified package. However, a variety of discovery layers can be used to search the central indexes from EBSCO, Ex Libris, and Serials Solutions. There are several implementations that use VuFind, Mango (the discovery interface created by The Florida Center for Library Automation), or other discovery interfaces in conjunction with the vendors' central indexes.

1. **Leading Web Scale Discovery Providers:**

There are both proprietary and open Source discovery tools available in the Web scale discovery market. Harvesting journal article metadata is difficulty in open source option whereas proprietary vendors collaborate with leading commercial publishers / aggregators for harvesting metadata in their central index. The major Web scale discovery providers are:

4.1. OCLC WorldCat Local (www.oclc.org/worldcatlocal)

4.2. Serials Solutions Summon (www.serialssolutions.com/discovery/summon)

4.3. EBSCO Discovery Services (www.ebscohost.com/discovery)

4.4. Ex Libris Primo Central (www.exlibrisgroup.com/category/PrimoCentral)

4.5. SirsiDynix Enterprise (http://www.sirsidynix.com/products/enterprise)

4.6 BiblioCommons (http://www.bibliocommons.com/)

4.7. AquaBrowser Library (http://www.proquest.com/libraries/academic/discovery-services/AquaBrowser.html)

4.8. Innovative Interfaces Encore (https://www.iii.com/products/sierra/encore)

4.9. Blacklight (http://projectblacklight.org/)

4.10. VuFind (http://vufind-org.github.io/vufind/)

4.11. SOPAC

4. OCLC WorldCat Local:

OCLC released the initial version of WorldCat in November 2007. In 2009, OCLC brought out their discovery platform, WorldCat local with centralized index collaborating more content providers. It delivers single-search-box access to more than 2 billion items from your library and the world's library collections. It includes the following:

- 2.2+ billion articles with single-click access to full text
- 50 million digital items from trusted sources like Google Books, OAIster and HathiTrust
- 21 million eBooks from leading aggregators and publishers
- 49 million pieces of evaluative content (Tables of Contents, cover art, summaries, etc.) included at no additional charge
- 351 million books in libraries worldwide

5. Serials Solutions Summon:

Summon is one of the early entrants into the library Web scale Discovery environment developed by serial solution and its first release was in July 2009. With Summon, users can discover content from more than 39 open access archives and 257 institutional repositories from 73 different institutions representing more than 40 million records that have been ingested into the service, most with full-text indexing.

6. EBSCO Discovery Services:

Ebsco began development of Ebsco Discovery Service (EDS) in 2008 and released for public use in 2009. EDS provides a fast, streamlined search through a single search box, but within the context of a greater experience that pulls together intuitive features and functionality, high-end indexing via inclusion of Subject Indexes, and instant access to critical full text, leveraged from the leading EBSCOhost research

platform and databases, and from key information providers. The EDS Base Index represents content from approximately 20,000 providers (and growing) in addition to metadata from another 70,000 book publishers. Although constantly growing, the EDS Base Index currently provides metadata for the following:

- About 50,000 magazines and journals
- Around 5 million books
- Almost 20,000 conference proceedings
- 8,25,000 CDs and DVDs

7. Ex Libris Primo Central:

It was developed in 2005 as a new-generation interface to provide relevancy based search for materials managed by a library's integrated library system, local content repositories, and other collections of interest that might be available for local indexing via the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH). It is a mega-aggregation of hundreds of millions of scholarly e-resources of global and regional importance. These include journal articles, e-books, reviews, and legal documents that are harvested from primary and secondary publishers and aggregators, and from open-access repositories. Provided by Ex Libris as a cloud service, later became Primo Central uses Apache Lucene or SOLR technology for managing local indexes. The Primo Central index seamlessly integrates into any library's information environment due to its suitable features. They are relevancy ranking, serendipitous discovery, next generation user interface, wealth of content, alma and primo interoperability, flexible configuration and customization, rich analysis and reporting, complete content neutrality, unique support for consortia, activate customer community.

8. SirsiDynix Enterprise:

It provides a platform for relevancy-based retrieval and faceted navigation for the content managed in a library's integrated library system. SirsiDynix Portfolio extends the platform with a digital asset management component that enables a library to describe local digital materials that can then be searched through Enterprise.

9. BiblioCommons:

It provides BiblioCore, which includes hosted discovery service relevan-

cy-based retrieval, faceted navigation, and a variety of social and community-oriented features. BiblioCommons maintains a discovery index that includes an aggregation of its customers' records from their respective ILS implementations.

10. AquaBrowser Library:

It provides an end-user index with faceted navigation and a cloud of search terms extracted from search results that can be used to execute new searches. AquaBrowser maintains a local index based on proprietary technology populated by records extracted and synchronized from the library's ILS implementation.

11. Innovative Interfaces Encore:

Originally introduced in 2006, supplements or replaces the online catalogues of Millennium or Sierra with a new interface that features a single search box, faceted navigation, and results ordered by relevancy. Encore was originally designed to operate with automation systems other than those from Innovative, but saw very few implementations. Encore is currently used only by libraries using Millennium or Sierra. Encore does not include its own article-level discovery index; Innovative works with EBSCO Information Services to integrate EBSCO Discovery Services for libraries that subscribe to both products. Encore also includes integration with e-book lending platforms.

12. Blacklight:

Developed by the University of Virginia, is based on a Ruby on Rails programming framework and Apache SOLR indexing, search, and retrieval technology. Blacklight provides a flexible toolkit for a wide variety of record types and is the predominant search interface to the Hydra Project digital asset management system.

13. VuFind:

Developed at Villanova University, is based on a PHP programming codebase and Apache SOLR indexing search and retrieval technology. It has been implemented in many libraries. Many of the projects work with forks of the original codebase and the development efforts can be characterized as independent and fragmented.

14. SOPAC:

SOPAC (Social Online Public Access Catalogue) is a Drupal module that provides true integration of your library catalogue system with the power of the Drupal content management system while allowing users to tag, rate, and review your holdings. User input is then incorporated into the discovery index so that SOPAC becomes a truly community-driven catalogue system. Because SOPAC depends on Locum to connect to our integrated library system, it has the potential to work with any ILS including the following:

- Faceted browsing
- Ajax-empowered interface with native jQuery support
- 100% customizable interface via the Drupal template system
- Ability to remove search limiters
- Saved searches
- Integrated renewals, holds placement, and fine payment
- Ability to customize the user experience via the administrative control panel
- Ability to create custom functionality via a Drupal sub-module

2. **Web Scale Discovery Service Implemented Libraries:**

15. OCLC's WorldCat Local (WCL)

- **University of Washington** (www.lib.washington.edu)
- **The University of Arizona** (http://universityofarizona.worldcat.org)
- **Bethel University** (http://bethellibraries.worldcat.org)
- **York St John University** (http://library.yorksj.ac.uk)
- Massachusetts Institute of Technology (MIT) Libraries (http://libraries.mit.edu/)
- University of Washington Libraries (http://www.lib.washington.edu/)
- University of Massachusetts Medical School (http://library.umassmed.edu/)
- Macalester College Library (https://www.macalester.edu/library/)

16. Serials Solutions' Summon (SSS)

- **Oregon State University** (http://osulibrary.oregonstate.edu)
- **University of Michigan** (www.lib.umich.edu)

- **North Carolina State University** (www.lib.ncsu.edu)
- **Senate House Libraries, University of London** (http://external.shl.lon.ac.uk/summon)
- Dartmouth College Library (http://library.dartmouth.edu/)
- Penn State University Libraries (http://www.libraries.psu.edu/psul/home.html)
- University of British Columbia (http://www.library.ubc.ca/summon/)

17. EBSCO's Discovery Service (EDS)

- **University of Georgia** (www.libs.uga.edu)
- **The University of North Carolina – Greensboro** (http://library.uncg.edu)
- **Okanagan College, Canada** (www.okanagan.bc.ca/administration/students/library.html)
- **Bournemouth University** (www.bournemouth.ac.uk/library/resources/mySearch.html)
- Philadelphia College of Osteopathic Medicine Library (http://www.pcom.edu/Library/index.php)
- University of Maryland University College Library (http://www.umuc.edu/library/index.cfm)
- Seton Hall University Library (http://www.shu.edu/academics/libraries/)

18. Ex Libris' Primo Central Index (PCI)

- **The University of Iowa** (www.lib.uiowa.edu)
- **Curtin University, Australia** (http://library.curtin.edu.au)
- **Northwestern University** (www.library.northwestern.edu)
- **The University of Manchester** (www.library.manchester.ac.uk/searchresources/librarysearch)
- Boston College University Libraries (http://www.bc.edu/libraries/)
- Iowa State University Library (http://www.lib.iastate.edu)
- Texas A&M University (http://library.tamu.edu/)

19. SirsiDynix Enterprise

- Wyoming State Library (http://library.wyo.gov/wyld/support/enterprise)

- Washington County Library (https://wcm.ent.sirsi.net/client/en_US/default)
- North Country Library System (https://catalog.ncls.org/client/nclscat)

20. BiblioCommons

- Aurora Public Library (http://www.library.aurora.on.ca/tags/bibliocore)
- Christchurch City Libraries (https://christchurch.bibliocommons.com/)
- The Seattle Public Library (https://seattle.bibliocommons.com/user/login)
- Hamilton Public Library (https://hpl.bibliocommons.com/user/login)

21. AquaBrowser Library

- Wesley College Library (http://wesleycollege.aquabrowser.com/?q=0451146417)
- Ramsey County Library (http://aquabrowser.rclreads.org/?hreciid=%7Clibrary%2Fm%2Framsey-hip%7C912754)
- Queens Library (http://www.queenslibrary.org/research/archives/collection-Information)

22. Innovative Interfaces Encore

- Syracuse University Library (http://surface.syr.edu/sul/Blacklight)
- Andrew L Bouwhuis Library – Canisius Library (http://libguides.canisius.edu/az.php)
- Texas State Library and Archives Commission *(www.tsl.state.tx.us/search/)*
- Langara College Library (http://langara.ca/library/)

23. VuFind

- Dartmouth College Library Labs (http://sites.dartmouth.edu/librarylabs/category/discovery/)
- Hobsons Bay Libraries (http://librarycatalogue.hobsonsbay.vic.gov.au/)
- Carnegie Mellon University Libraries (https://search.library.cmu.edu/vufind/Search/Advanced)
- Rutgers University Library (https://www.libraries.rutgers.edu/)

24. SOPAC

- Darien Public Library (https://www.darienlibrary.org/catalog/)
- National Library of Australia (http://catalogue.nla.gov.au/Record/3626973)

25. Advantages:

There are several advantages to web scale discovery. The chief advantage seems to be ease of use for patrons. In their usability testing, Gross and Sheridan found about WSD tool that "there is no doubt that the students found the [web scale discovery tool] an easy way to get results and probably easier than the various options they were previously faced with."

- ✓ Ease and simple to use
- ✓ All search results in a single place
- ✓ More comprehensive than traditional database searches
- ✓ Potential use with other devices, including mobile devices and social media outlets
- ✓ Searches popular and lesser-known databases
- ✓ Sheer breadth and depth of the indexes.
- ✓ Increased use of library resources
- ✓ Access to remote index platforms via API
- ✓ Helps libraries stay current in information searching tools and technologies
- ✓ Updated and improved frequently

3. Disadvantages:

- Less accessible
- Tailored to researchers, not average users
- Very costly both from a monetary and staff time perspective.
- Returned results can be overwhelming in number
- With more relevant results
- With more results comes more irrelevant results that users must silt through

- Privacy issues arise with inclusion of social media outlets
- Varied features across providers

26. Conclusion:

Web scale discovery tools index consists of an incredible amount of information and are very easy for users to search and access it. It is unsure whether that converts into users finding exactly what they need, as several studies showed users had trouble applying the results they received. Web scale services are still in its initial stages of development and lot of development in the features, functionality, level of integration with other systems, scope of content, and soundness of metadata, flexibility of the interface are all evolving and it is expected. Further, it will continue to evolve in meeting the needs and expectations next generation users. These tools are probably best suited for the novice searcher in any academic setting; more advanced users may find discipline specific databases continue to provide a better search experience. Web scale discovery tools harness the power of a massive index and couple it with the simplicity of a single search box. Libraries hoping to compete with Google as the first point of search for their users would be wise to investigate this new breed of discovery tool. Selecting and implementing a suitable web-scale discovery service is a large and important undertaking that involves a significant investment of time, staff, and resources. Finally the right WSD begins with a thorough and carefully planned evaluation process only. The best way to learn and implement WSD service is to request fully customized trial from vendors including our local catalogue and Institutional repository integration. It is advisable to go for multiple providers trials and evaluate all systems based on the parameters required by your own library and feedback collected from the other implemented libraries. Users' requirements are the most important factors to be considered while executing web scale discovery service and Information professionals should take utmost care in each step to make their effort successful.

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Websites of Public Libraries in Karnataka: An Analysis

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Abstract: Public libraries are considered as an essential part of modern society and play a very important role in any community. Library Websites are very much essential for any kind of libraries. Many of the public libraries in India and across the world have their own web sites, through which they deliver the service. There have been many studies on the content analysis of websites of academic libraries and particularly college and university libraries. This paper identifies the public libraries in Karnataka that have websites and describes the website of the Department of Public Library, Government of Karnataka. It is advised that public libraries in the state should develop their own websites.

1. Introduction:

Public libraries are considered as an essential part of modern society and play a very important role in any community. Public libraries serve the general public and special categories of the public. Public libraries are social institutions that support development in the society by offering free access to information. **UNESCO** defines public library as "local gateway to knowledge that provides a basic condition for lifelong learning, independent decision- making and cultural development of the individuals and social group". Public libraries cater to a wide variety of users and as such perform many challenging functions.

Library Websites are very much essential for any kind of libraries. These are useful tools to keep informed about library activities and new services. Libraries offer new services through their website. Library web sites can also serve as means of their extension activities. These allow easy bridging of distances between user and the library. Basically it provides a single window searchable interface to large amount of information and seamless access across the disturbed libraries through

World Wide Web. All public libraries whose aim is to support local community with information provided by them can put them on web to serve user community. Many of the public libraries in India and across the world have their own web sites, through which they deliver the service. An effort is made in this paper to know status i.e how many public libraries in Karnataka state – a state which is in the forefront in public library system.

2. Review of literature

There have been many studies on the content analysis of websites of academic libraries and particularly college and university libraries. A number of studies have also been reported on websites of libraries of institutions of national repute. A few studies that focus on the public library websites in the Indian context have been reported and most of the studies are explorative in nature. Janardhan rao (2006) observes the importance of portals in libraries and identifies and describes a number of models for information systems which are experimented by libraries to serve up Internet based content portals, vortals and information gateways.

Bandyopadhyay and Majumder (2006) observe that state of West Bengal in India has a well-developed system of 2821 public libraries and information centres and some of these public libraries are at the primary stage of providing digitised services including library websites. Using different parameters/factors Khan and Shehzad (2015) assessed the websites of the National Libraries of Bangladesh, India, Pakistan, Singapore and Sri Lanka. Thirty five web analysis parameters/ factors were used for the evaluation process of the websites. An expert evaluation method was implemented to explore the study. The website of National Library Board Singapore ranked first and National Archives and National Library of Bangladesh ranked at last.

3. Public libraries in India

Public libraries in India are spread all over the country, consisting state central libraries in every state, district libraries, and urban public libraries at the cities and rural public libraries at the villages. Public libraries are mainly supported by state governments and local authorities, and sometimes by the central government, development agencies, non- government organizations and private trusts. Public library development in the state is the responsibility of the respective state government. Nineteen states (RRRLF, 2017) in India have enacted Public Libraries Act in their states. The library legislation ensure the smooth functioning of the

public libraries in the states. A state may have three tiers of public libraries in hierarchy. The apex body would be a state central library, the next tier consists of district libraries in all districts of the state, and third tier consists of rural and urban public libraries spread all over the state.

4. Public Libraries in Karnataka

Karnataka is one of the oldest states in the country which has passed its own public library act way back in 1965. It stands ahead in many fronts of public library operations. As a result of legislation and developments of the Government of Karnataka, public library system in the state has received an important place in the overall administration. The following tables show the number of different public libraries in Karnataka.

Table 1: Number of Public Libraries in Karnataka

Types of public libraries	**Number**
State Central Library	**1**
City Central Libraries	**26**
District Central Libraries	**30**
Branch Libraries	**496**
Gram Panchayat Libraries	**5766**
Mobile libraries	**15**

Source: Department of Public libraries, Government of Karnataka, Bengaluru (http://www.karnatakapubliclibrary.gov.in/)

5. Methodology

The present study has been carried out to identity the public libraries in the state of Karnataka that have their web sites and also to study the contents of the Public libraries web sites. Geographically the study is restricted to Karnataka public library or library systems that have web pages and portals. A Google search was made on the names of all City Central Libraries and District Central Libraries including State Central Reference Library Bengaluru. A search was also made on the Department of Public Libraries, Government of Karnataka. An advanced Google search was also made using key words, 'Public libraries', 'websites' and 'Karnataka'.

6. Results and Discussion:

The search led to many links and on further analysis it is found that neither the State Central Library, Bengaluru nor any of the CCL's nor any of the DCL's have their independent websites. However, State Central Library, Bengaluru and CCL's of Mysuru and Bengaluru including their branch libraries are indexed in Google through local search engines like www.bangalorebest.com, https://foursquare.com, www.bangaloretourism.org, https://www.quora.com, www.mysore.nic.in, yellowpages.sulekha.com, www.justdial.com, etc. These provide very basic information like address, phone numbers, working hours, ratings/reviews etc.

The Department of Public Libraries, Government of Karnataka has a website www.**karnatakapubliclibrary**.gov.in designed by Education Information center. The website has hosting at NIC Karnataka and the copyright is in the name of Department of Public Library. The contents are in the official language of the state Kannada with provision for translation into other languages.

Since this is the website of the Department of the Government, it contains information that needs to be provided by the Government department. Activities and programmes of the Department of Public Library, GOK is reported with due emphasis on the bio-profile of the Minister concerned. The photo gallery is also available. The home page also acts as an index through which any content can be navigated (Fig 1). Books available at National Library, Kolkata, Raja Ram Mohan Library, Ministry of Culture, Education Secretariate, and British Library can be browsed. Recent circulars and notices are displayed as flash news.

The website stresses more on news and advertisements with required link to the page. In addition to this it provides information on the working hours and working days (Fig 2). A description regarding the Department of Public Library is also provided with historical touch (Fig 3). Different types of libraries functioning under the umbrella of the Department are also reported (Fig 4). Statistical type of information or directory type of information is provided. Statistical description of State Central Library, City Central Libraries and District Central Libraries (including branches) are highlighted.

Information required to be displayed as per Section 4 (1) (b) and Section 5 (1) (c) of RTI 2005 is provided in the prescribed format (Fig 5). The Budget details are given with emphasis to the current financial year. Approved list of fund investment and allotment to various works is also depicted library-wise (Fig 6). Activities of the Government particularly e-governance, RRLP and building details are also provided (Fig 7). Provision for downloading KPL Act 1965, Govt. Rules, State Gazette and Sample formats is also made (Fig 8). Contact details of the officer to

be contacted with address, phone number and e-mail are provided in the website (Fig 9).

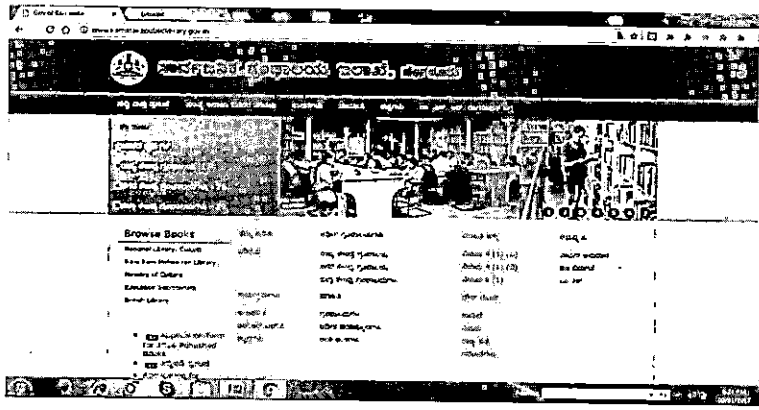


Fig 1: Home page of the Department of Public Libraries, GOK

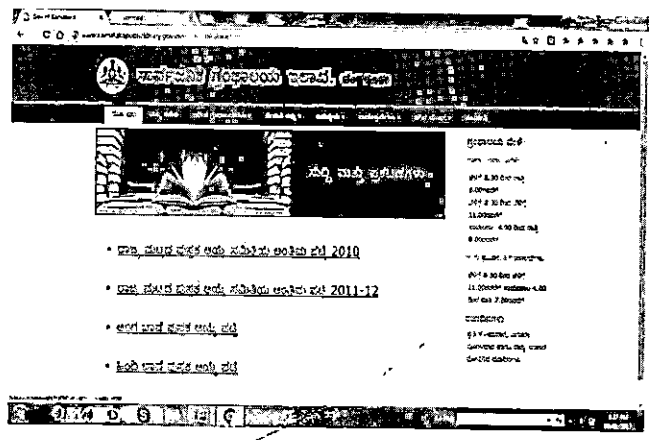


Fig 2: News and announcements

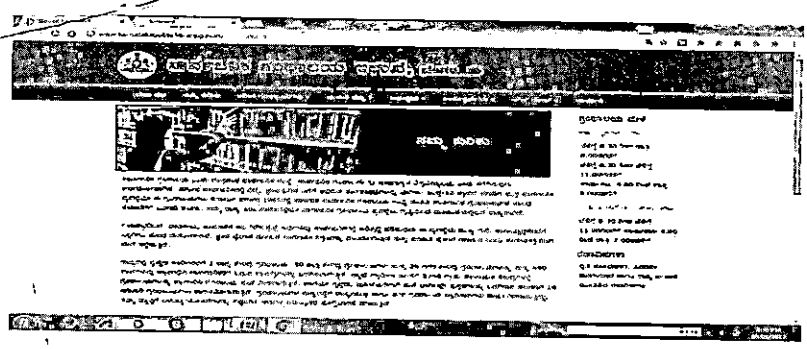


Fig 3: About Department of Public Library

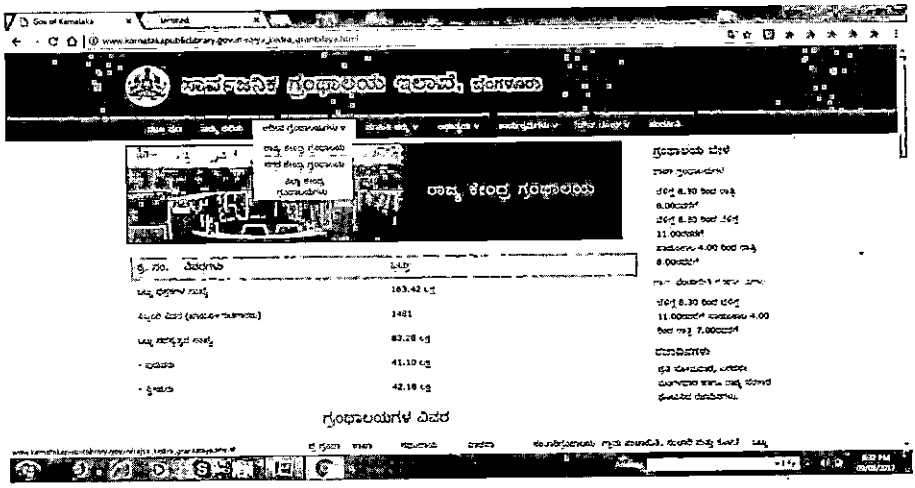


Fig 4: Libraries under the umbrella of Department of Public Libraries

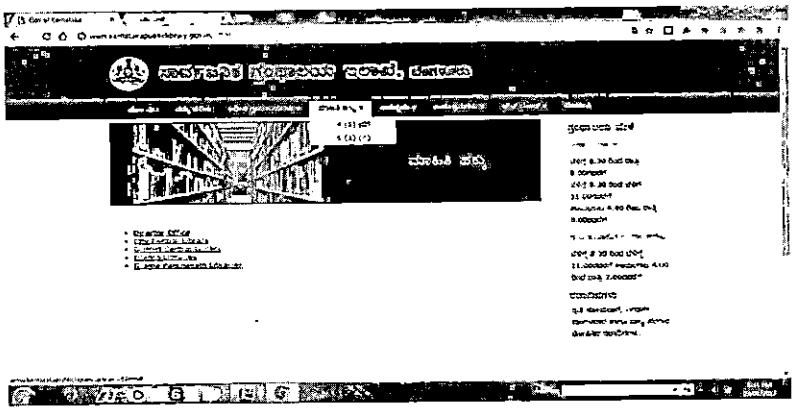


Fig 5: Information displayed as per RTI

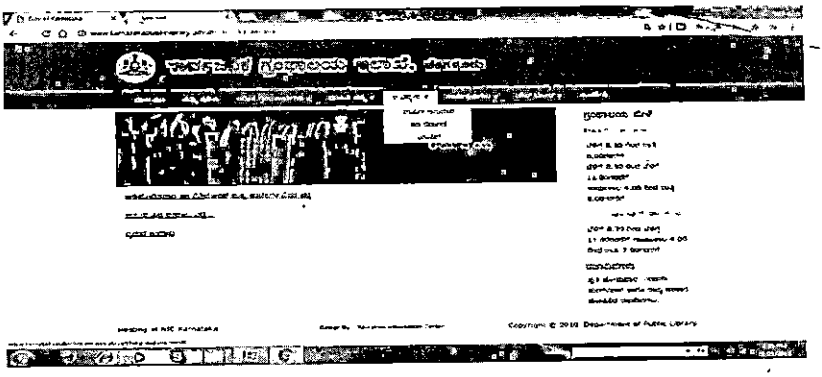


Fig 6: Budget details of the Department of Public Libraries

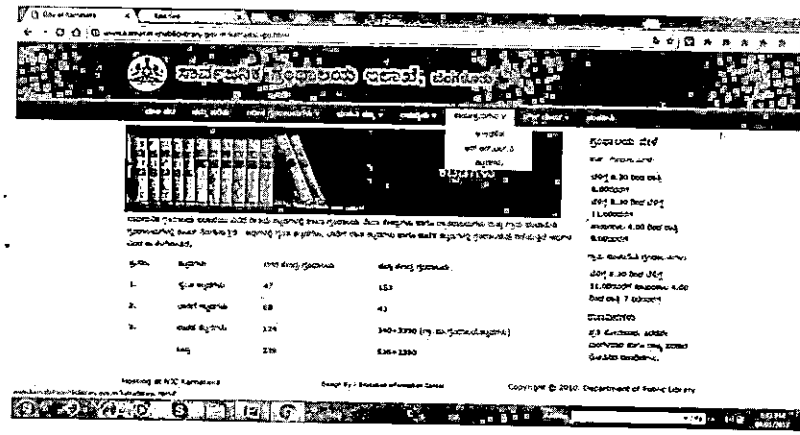


Fig 7: Activities of Department of Public Libraries

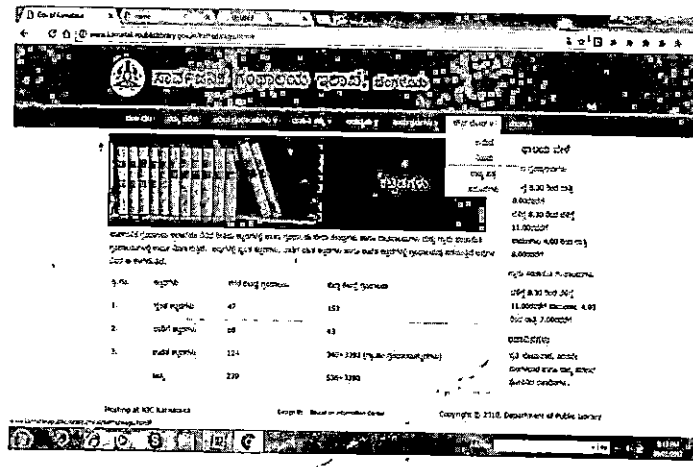


Fig 8: Download facilities

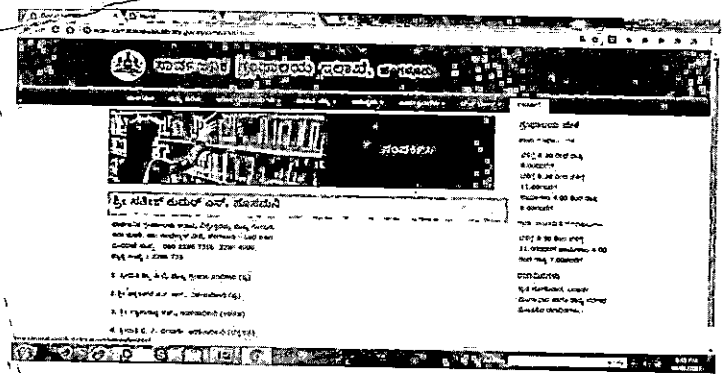


Fig 9: Contact details

7. Conclusions:

The findings of the study clearly indicate that though minimum information on few libraries is available on the net, public libraries in Karnataka do not have their own websites. The reasons could be many including lack of computer literacy among people. But the latest trend is that web based services are emphasized for the public libraries, so as to provide information services to all users. Due to the invention of the internet, every library including public library in the world has their own web site for providing web based services. Web is increasingly an important resource in many aspect of life as education, employment, government, commerce, health care and more.

Today every library is transformed due to the emerging information and communication technological application. Library website is an indispensable and essential tool for the user community to be in touch with the library and know what's happening because web sites often provide the first Impression of a Library. Web sites among other things can gain strategic advantages for library organizations such as institutional chance, attaching prospective applicants, building community and sharing knowledge. Karnataka is one of the leading states in the country to enact its public library act way back in 1965 and also start Gram Panchayat libraries in every village having Grama Panchayat. It has taken many initiatives to implement ICT in the public libraries. It is high time that the public libraries should showcase their activities through their websites. It is the necessity of the hour. When the country is moving towards Digital India its public library system should support the very concept of digital India and the public library system should gear up itself for tomorrow. Having its own website is an initiative that the Karnataka Public Library system has to take, to exploit the benefits of the technology in particular the web.

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DELNET SERVICES AT AMBEDKAR UNIVERSITY DELHI LIBRARY

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Abstract: In the age of electronic era university libraries are transforming its services for the betterment of the user's demands. In this way of changing information need DELNET has played an essential roll to fulfill information thrust of university users. But DELNET provides its services to its registered users only. In this paper we will discuss about the DELNET services in particular context of Ambedkar University Delhi. The paper will focus on the transactions between AUD Library and DELNET since its membership was established. Many AUD users have benefited from the DELNET service and have completed their projects and other information need.

1. Introduction:

In 21st Century Academic libraries in India are playing a prominent role in the information or knowledge management. In this way academic libraries with in India have successfully been established many networks like INFLIBNET, NICNET, INDONET, ERNET, CALIBNET, DELNET, ADINET, MALIBNET, etc. Academic libraries are the treasure house of information and knowledge resources which fulfill the essential need of academician of higher education i.e scholars, scientists, technocrats, researchers, students and others. The main purposes of academic libraries are changing academic society in India. To manage the information flow DELNET-Developing Library Network has played a major role to in resource sharing library network in India connecting. The scopes of DELNET services are not limited with in the country but also served to outside. DELNET has provided its service to 5566 libraries in India and 25 Libraries in outside India. Ambedkar University Delhi Library is also the member of DELNET services and shares its resources. This affiliation between DELNET and AUD is very much beneficial for the researcher, Academicians etc for the development of research and society. So, here we will know about the Ambedkar University Delhi Library and its services in brief and growth in services with DELNET.

2. Ambedkar University Delhi

The AUD is first university in the field of social and humanities discipline in Delhi state established by Government of NCT of Delhi vide its notification through an Act of Legislature in 2007 and was notified in July 2008. The University is focusing

on research, postgraduate and under graduate disciplines in the field of social science and humanities for bringing social justice and humanities among society.

3. AUD Library

Ambedkar University Library is a core value of the university education system. The Library is fully furnished with latest amenities. **AUD Library** develops and provides essential and specialized information resources and services to meet the growing information needs by developing user-based resources, Organising information resources, providing human and technologically moderated access to information; and Aiding users to identify, locate, obtain and evaluate information at both the campuses.. Library has a specialized collection of resources taking into consideration the course contents and research needs of all the schools and centres of the university. Library has a strong collection development policy and on an average, four thousand books are added to the collection every year. As on date it has a stock of about more than 36000 volumes. Library subscribes to over 52 scholarly print Journals national and International, and e-journals and receives several journals on exchange and gratis. It has acquired about 162 ebooks and 262 audio-visual materials. AUD Library one of the growing social science and humanities library in Delhi to provide access to e-journals, e-books in the related fields. As on today, more than 15000 full text online journals are accessible in the university online and off line. The university library is part of the UGC INFLIBNET consortium and DELNET. Online databases are accessible via the Library portal, which provide access to full-text scholarly research articles beyond the physical confines of the library.

Further, as we have discussed earlier that Ambedkar University Delhi Library is a member of developing Library network (DELNET). DELNET is the best resource sharing centre for the libraries at national and international libraries. DELNET has reached up to 5591 libraries across the world.

AUD is accessioning DELNET services as per signed MoU. The services are provided to all the faculty members of the AUD and research Scholars. The users may send their requirement through email to the concerned library staff and the same mail is delievered to the DELNET centre. DELNET arranged the information source from its member libraries and send it to the requested library and also inform to the user that their information has been send to his/her concerned institute library. These services are chargable and these charges are borne by the user. The details of the service of DELNET will be discuss in details in this paper.

4. Brief about DELNET:

DELNET Developing Library Network was established in January 1988 and registered in society in1992. It was initially supported by the National Information System for Science and Technology (NISSAT), Department of Scientific and Industrial Research, Government of India. It was subsequently supported by the National Informatics Centre, Department of Information Technology, Ministry of Communications and Information Technology, Government of India and the Ministry of Culture, Government of India. It is non government nonprofit organization. It has the 5591 member from India and 25 abroad.

DELNET services to is Members:

The main services provided by the DELNET

- **Union Catalogue and Database** It Provide access to Union Catalogues of Books, Periodicals, Union list of current Periodicals, Video Recordings, Sound Recoding and many other databases like database of Periodical articles, CD-ROM, Theses and Dissertation and It also provide access to the profile of member library
- Retro-Conversion It take the project to convert the manually record in machine readable form.
- Reference Services: It act as a referral centre which provides reference service to its member libraries. This centre provides prompt replies to its user.
- Professional Training It organize workshop, lecture, tutorial and many training programmes from time to time.
- Technical Support It provide the technical support to its member in the section of Hardware, Software, Communication links, Database Creation and help its member to solve the technical problems from time to time.
- **Inter Library Loan (ILL):** It provide ILL service to its Members. Request received by its member through various modes DELNET quickly locate the book and deliver to its member.
- Document Delivery Services(DDS) As DELNET received the request for the journal article through emails, fax, Online System, etc. It send the photocopy of the article to its user.

MEMBERSHIP PROCESS:

- Any Academic Institutional willing to became member of DELNET need to share their resources (print, e-resource, online database and interested in other resources) with DELNET. For becoming member institute members are required the following charges for accessing DELNET services.

INDIA and Other SAARC Countries	
Admission fee (one-time)	Rs.5,000/-
Institutional Membership Fee**(Mandatory)**	Rs.11,500/-per annum
For New Membership -- Amount to be Paid	Rs. 16,500/- (Admission Fee + Institutional Membership Fee)
For Renewal of Membership -- Amount to be Paid	Rs. 11,500/-
Non-SAARC Countries	
Admission fee (one-time)	U.S.$ 100/-
Institutional Membership Fee	U.S.$ 500/-per annum
Photocopying/Courier/Postal Charges	
ILL Online (for members in Delhi).	Actual photocopying charges, if any, and courier/postal charges for books procured from outside Delhi will be extra.
ILL Online (for members outside Delhi)	Actual photocopying charges, and courier charges will be extra

5. TRANSACTION BETWEEN AUD AND DELNET

In the growing academic institutions in India Ambedkar University Delhi has an eminent place among the academic institutions in Delhi and its neighboring states. Since the membership with DELNET Ambedkar University library has many transaction between AUD and Delnet. There are few tables which will representation the transactions between DELNET and Ambedkar University Delhi Library. These tables are categories year wise.

Table 1(Year 2011)

S.No.	Months	No. of Books Issued to DELNET	No. of Books From DELNET	% of books issued to DELNET
1	January	10	0	28.57
2	February	4	0	11.42
3	March	5	0	14.29
4	April	2	0	5.71
5	May	1	0	2.86

6	June	3	0	8.57
7	July	5	0	14.29
8	August	1	0	2.86
9	September	0	0	00
10	October	1	0	2.86
11	November	2	0	5.71
12	December	1	0	2.86
	Total	35	0	

The table shows that in the year AUD have not received any document through Inter Library Loan, even than AUD library serve 35 documents throughout the year. In the month of January 2011 AUD shares its 10 books with DELNET. This means AUD library having a rich collection which is helpful to support in learning, teaching and research programmes. In the month of May, August, September, October and December the services were traced very less. In the year 2011 no services was availed by the AUD from Delnet.

TABLE 2(YEAR-2012)

S.No.	Months	No. of Books Issued to DELNET	No. of Books From DELNET
1	January	4	0
2	February	0	0
3	March	0	0
4	April	3	0
5	May	1	0
6	June	5	0
7	July	2	0
8	August	10	10
9	September	6	10
10	October	3	4
11	November	5	2
12	December	1	10
	Total	40	36

Table 2 represents that there satisfactory improvement between services rendered by both service providers. In this table is very clear that in the month of August, September and December the services were increased very well. These tables clearly indicate usability of DELNET services provided by DELNET.

TABLE 3(YEAR 2013)

S.No.	Months	No. of Books Issued to DELNET	No. of Books From DELNET
1	January	0	14
2	February	1	6
3	March	3	3
4	April	1	5
5	May	2	14
6	June	3	4
7	July	3	7
8	August	2	6
9	September	4	7
10	October	4	3
11	November	4	10
12	December	3	3
	TOTAL	**30**	**82**

Table 3 enacted that the services have increased very speedily in this year. In this table AUD Library have received 82 books from DELNET and shared 30 books from AUD Library. In this table it is very much clear that AUD library have received maximum document in the month of January, Nay, November and in the remaining month average was similar. This table expresses that how much DELNET resources are important for researchers.

TABLE 4 (YEAR 2014)

S.No.	Months	No. of Books Issued to DELNET	No. of Books From DELNET
1	January	8	8
2	February	2	9
3	March	3	5
4	April	3	17

5	May	9	8
6	June	4	1
7	July	1	23
8	August	5	18
9	September	4	7
10	October	2	6
11	November	5	5
12	December	4	7
	TOTAL	**50**	**114**

Table 4 represents the graph of the increasing services among both the stakeholders. Here one more interesting thing that how much AUD resources are used by the external users through DELNET. Here we have seen services from DELNET has increased very fast specifically in the month of April, July August and in remaining months the ILL service is very good.

TABLE-5 (YEAR 2015)

S.No.	Months	No. of Books Issued to DEL-NET	No. of Books From DELNET
1	January	3	1
2	February	1	7
3	March	0	8
4	April	11	7
5	May	13	1
6	June	11	2
7	July	16	14
8	August	12	12
9	September	16	34
10	October	17	22
11	November	11	5
12	December	15	10
	TOTAL	126	122

In this table there is little difference between the usability of books between both the resource providers. In this table we will find that DELNET has used more

books from AUD. But if we see in details we will find that in the month of August, September, October AUD have received maximum books from DELNET and from month of April to December AUD have shared its almost average quantity of books.

TABLE 6 (Year 2016)

S.No.	Months	No. of Books Issued to DELNET	No. of Books From DELNET
1	January	23	9
2	February	12	19
3	March	24	15
4	April	24	7
5	May	12	3
6	June	24	7
7	July	12	4
8	August		
9	September		
10	October		
11	November		
12	December		
	TOTAL		

Findings

In this paper the following findings were came out:

1. Collaboration plays a great roll in the development of resource sharing.
2. Developing Library Network plays a great roll to make bridge between the registered members to sharing resources.
3. Sharing of resources reduced financial burden on the institute
4. This type of relationship making strong relationship among institutes.
5. Enhancing the use on information technology

6. Conclusion:

In this paper we find that Ambedkar University Delhi has collaborate with DELNET in 2011 with minimum usability of resources for its resources. During the study we found that in the first year there were only few users who uses these services but later on these services increases very fast. It only became possible due to the efforts made by DELNET. DELNET has collected information from its members libraries and serves to its another member where they have demanded. In this study we find that AUD has also played a great roll in resources sharing for other DELNET members users in a short span of time. In the whole paper it is very much clear that the resource sharing between organizations creates a positive environment and provides best efforts foe improving services. So, that the academic fraternity may grab proper information as per need at large scale. AUD Library serves all best services to its users as per their need but the services received from DELNET make these services enhance richness in the services rendered to users. So, DELNET is the best platform to exchange resources among registered members of the network. User mainly consults books, Journals, CD-ROMs etc. or for reference only. Due to multi-dimensional options to get their desired and latest information users interact towards DELNET as it resolve the queries related to teaching and research. Users have the better and

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DEVELOPING AN INTEGRATED LIBRARY SYSTEM (ILS) IN GULBARGA UNIVERSITY LIBRARY USING OPEN SOURCE SOFTWARE KOHA

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Abstract: This paper aims to provide the open source software koha using Gulbarga university by developing an integrated library system .The article explain open source software meaning advantages disadvantages in general and explain about ' koha' its features standard requirements and modules.

1. INTORDUCTION

Gulbarga University is one of the leading centers of academic excellence which caters to the educational needs of the society located in the developing region of Hyderabad Karnataka . Established in 1980, it has a sprawling green campus of 860 acres. Within a short span, the university has achieved marvelous academic and research excellence with 39 Post-graduate departments and P. G. Centers at Bidar, Raichur and Sharana Sahitya Library and Resource Centre at Basavakalyan. Guided by its vision of excellence in higher education and wedded to the mission of equity, justice, harmony and progress, the university has exceeded the benchmark and expectations of those who were instrumental in its establishment.

Gulbarga University Library, a knowledge center for accessibility, developed on modern lines as a prominent Learning Resource Center on sprawling Campus, is ideally situated and easily accessible by all the departments and students housing. The University Library, makes sincere efforts to provide user focused services having over 2,27,831 books, subscribes 654 scientific journals, Sixteen CD-ROM databases (Current + Archival), 5800 dissertation/theses and technical reports, microfilm, microfiche, conference papers and rare books. The Library is at the core of

research and learning at the University and automated its in-house activities and services using KOHA – integrated open source software using cloud technology. Virtual Learning Resource Center and Digital Library (VLRC & DL), with 150 computer systems and three main servers, a giant leap into information age is at the heart of the University Learning experience supporting e-LTR (e-Learning Teaching and Research), provides access to UGC INFONET e-resources (12,000 e-journals+ & databases), Internet and e-learning, course materials and e-books using one Gbps leased line connectivity under NMEICT Project. Remote access facility, Virtual Reference through Question Point Service, OCLC-USA, Institutional Repository, Career Planning and User Sensitization Programs are a few unique services rendered to promote the optimum use of library resources. Wi-fi (Wireless Fidelity) access is available across the library.

The library received Dr. Padhya Best University Library Award for 2007 instituted by Indian Library Association, New Delhi and recipient of "eINDIA Award 2011" for the Best ICT Enabled University at India's Largest ICT Event during December 2011.

2. What does open Source Mean?

- The term "open source" refers to software that is free and that includes the original source code used to create it so that users can modify it to make it work better for them.
- Open source software may be free, a developer or distributor may charge for services, including special programming, installation, training, and technical support.
- Quality, not profit drives open source developers who take personal pride. Simple use it and is not locked any single person or institution.

3. Advantages of Open Source Software:

Ability to tailor to fit local needs: The availability of the source code means that a user can modify and enhance the software to more closely fit its own needs.

No restriction on use: There are no contractual restrictions on how the software is used.

Low cost: There is no charge for the software itself. The major cost is local development. If the number of users is large, and they share their efforts, each user's cost is reduced.

4. Disadvantages of Open Source Software:

Unanticipated Efforts: A library may find that it needs to do a great deal more

work than anticipated to adapt the software to local needs.

***Lack of coordination*:** The decentralized development of open source software means that progress can be chaotic and there may be delays in addressing bugs.

***Inadequate technical support*:** Documentation tends to be limited and aimed at developers. There usually is limited technical support, especially for users of the software.

Customization: Open source software may not offer the level of customization as it is being done in case of commercial software.

5. Open Source Integrated Library System Products:

- MicroLCS,
- Emilda
- Evergreen
- FireFly
- GNUTeca
- Avanti
- Koha
- OpenBiblio
- phpMyLibrary
- PMB
- PYTHEAS
- WEBLIS.

6. Criteria for Evaluating Open Source Integrated Library Systems:

- There is active current development under way.
- At least the cataloging, circulation, patron access catalog modules, acquisitions and serials control should be available. It should be integrated library system.
- MARC is supported.
- Current source code and documentation are available for downloading under the GNU General Public License
- The product is currently in use in libraries.
- Scalability
- Adaptability and user friendly system.

7. What is Koha?

Koha is an open source software. That means, its source code is open. Anyone can develop from anywhere of the world in any time. And with help of open source developers, now KOHA is known as the most powerful ILS of the world of information and library system. Moreover, KOHA has some advantages over other ILS. Some of the advantages of the KOHA has been stated below. Full featured ILS: KOHA is known as used in any kind of library big or small. It is a true enterprise class ILS with various features. KOHA includes modules for circulation, cataloguing, acquisitions, serials, reserves, patron management, branch relationship, and more.

Koha is a full featured Integrated Library System (ILS). There is no cost for the license; you have the freedom to modify the product to adapt it to your needs, etc.

Developed initially in New Zealand by Katipo Communications with Horowhenua Library Trust.

It is currently maintained by a dedicated team of software providers and library technology staff from around the globe.

That by adopting it, the customer becomes "joint owner" of the product. In particular, the customer can freely install new versions or not, and can take part in new developments by financing them or by carrying them out them self.

8. Why Open Source Software Koha:

Cost-effective: paying licensing fees for proprietary solutions, users of open-source software can often deploy the product using in-house resources. They pay only for needed support or any additional vendor services they require.

Innovation: code is open, users are free to innovate and improve the software to meet their needs free innovation also means that open-source software has much faster development cycles when compared to proprietary software.

Free/open source software koha is an economical alternative to reliance upon commercially supplied software. It means the cost involved development, license, upgrading, maintenance etc., lower than commercial software. koha does not need the initial cost like commercial software.

Free/Open source Koha has all the feature of commercial software.

Motivate and encourage staff to creativities.

9. What does it cost Koha?

Free/open source software Free download under the GNU General Public License.

Users of open-source software Koha can often deploy yourself using in-house resources. They pay only for needed support or any additional vendor services they require.

It means the cost involved development, upgrading, maintenance etc., Koha does not need the initial cost like commercial software.

Here cost means commitment, dedication, and a long term efforts to sustain and development of the software.

10. Who uses Koha?

More than 300 libraries are using Koha, including academic, public, school and special libraries, in India, Africa, Australia, Canada, USA, France and, of course, New Zealand. Along with a committed team of programmers its development is steered by a growing community of libraries collaborating to achieve their technology.

11. Koha User:

Name	Type	website
Antioch University	Academic	http://library.afognak.org/
Northland Bible Baptist College	Academic	https://libcat.nbbc.edu/
Childcare Resource and Research Unit – University of Toronto	Academic	http://circonline.ca
West Liberty Public Library	Public	http://opac.wlpl.org
Nelsonville Public Library System (7 library branches	Public	http://search.athenscounty.lib.oh.us/
Horowhenua Library Trust	Public	http://www.library.org.nz/
Asian School of Business, Trivandrum, Kerala	Business school	www.asb.edu.in

12. Koha and Commercial LMS:

Sl. No	Core services	Alice	Libsys	New Genlib	Soul	VTLS	Libsuite	Koha
01	Acquisition	1	1	1	1	1	1	1
02	Cataloguing	1	1	1	1	1	1	1
03	Circulation	1	1	1	1	1	1	1

04	Web/OPAC	1	1	1	1	1	1	1
05	Serials	1	1	1	1	1	1	1
06	Biblio format	1	1	1	1	1	1	1
07	Data exchange	1	1	1	1	1	1	1
10	Standards	1	1	1	1	1	1	1
11	Cost(Approx.)	3.5 Lakh	4.5 Lakh	Open Source	50000	8.00 Lakh	4.5 Lakh	Open Source

13. Koha Features:

- A full featured modern integrated library software (ILS).
- Award winning and free/Open-source Software.(no license fee).
- OS independent any operating system. Linux, UNIX, Mac.
- Web based. Web-based Interfaces. We can integrate with website.
- Full MARC21 and UNIMARC support for professional cataloguing.
- Multilingual and multi-user support.
- Library-Standards-Compliant. Industrial standards & protocols.
- Z39.50 server.
- Customizable web based opac circulation system.
- Online reservation.
- Full catalogue, circulation, acquisitions, library stock management.
- Web based OPAC, public to search the catalogue.
- Major industry-standard database type (text, RDBMS), SQL, MYSQL.
- Serial management module.
- Print your barcode.
- Export and import records, ISO2709.

14. Koha System Architecture:

Koha is based on a client-server architecture.

Network Server: koha can be installed on a server running Linux, UNIX, and Mac. The recommended operating system is stable version of Debian Linux, although Koha can run on any modern operating system.

Client Workstations: Koha requires only a web browser on the workstation

(a graphical browser, or even a text browser for the OPAC). Koha thus functions on PCs running Windows, PCs running Linux, Macs, or even UNIX workstations.

Koha runs over any TCP-IP network.

Koha accommodates low-bandwidth connections. It is completely usable on ordinary telephone line connections. This is more true of the librarian interface than of the public interface (OPAC).

15. Koha Standards:

- The developers of the product have taken care to adhere strictly to international standards.
- Industry standards: Z39.50, UNIMARC, ISO2709, MARC21.
- For technical standards: the OPAC is "valid XHTML ", and respects the standards of accessibility.
- Web standards recommended by the World Wide Web Consortium.

16. Koha Requirement:

- Koha version 2.2.9 Free (download from http://www.koha.org/
- Apache web server, 2.0.58 free (download from (http://www.apache.org)
- MySQL. Relational Database Management System (http://www.mysql.com) free
- Perl modules 5.8. (http://www.cpan.org) free.
- Linux (RHEL 3.0, 4.0, 5.0) or Any flavor of LINUX or WINDOWS Server.

17. Koha Server Software:

- **Server operating system**: Linux, OpenBSD, FreeBSD, MacOSX, or any other Unix.
- **Web server**: Apache.
- **Programming language**: Perl.
- **Database**: MySQL.
- **Integrated Library software**: Koha 2.2.9

18. Koha Client Software:

- Koha requires a recent Internet browser.
- Mozilla is advised, but not obligatory. (Koha works with Internet Explorer.).
- Certain data validity checks are made on the client machine, JavaScript

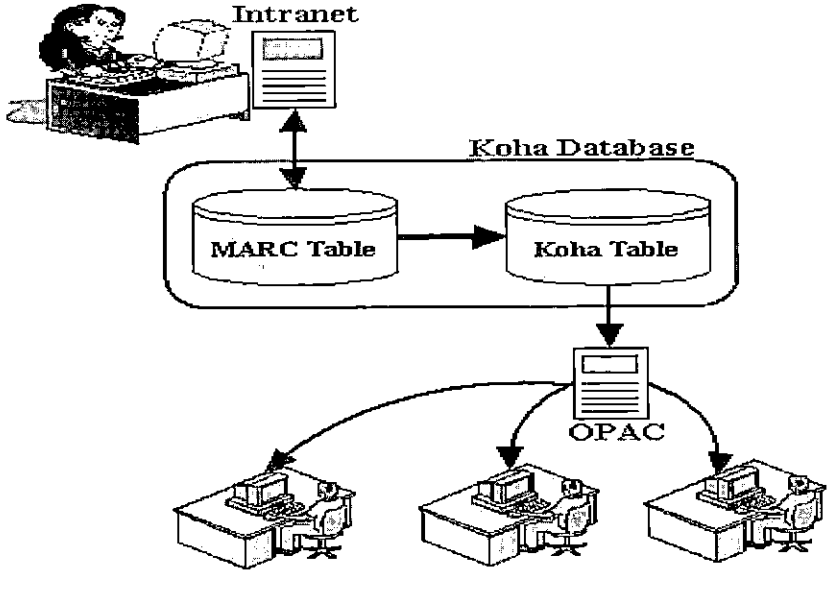
must be enabled.

- The public interface (OPAC) conforms with XHTML1.0 standards: the utility is thus compatible with alternate browsers. In particular, the OPAC can be used by people needing special assistive technology (Braille browsers, voice synthesis, text-based browsers, etc.).

19. Skill Requirements to Operate System:

- Koha's interfaces are designed with usability in mind and are extremely user friendly.
- Staff and patrons with only basic computer skills have quickly learned to use the system efficiently.
- The cataloging module requires an understanding of cataloging practices such as MARC, Z30.50 retrieval tools, how to add holdings information, etc.
- Administrators should know operating system (Linux, etc.) for maintenance, some knowledge of cataloging in setting up the system preferences.

System Overview:



20. Koha Modules:

- OPAC
- Full catalogue.
- Circulation.

- Serials.
- Acquisition.
- Patron Management.
- Branch management.
- Reservations.

21. Koha OPAC Module:

- Koha provides a full-functioned Online Public Access Catalog (OPAC).
- OPAC users can carry out searches starting from ten fields (Keyword, Subject, Title, Class, Barcode, author, publisher, etc.). As in the librarian interface, they can order the results according to several criteria.
- OPAC users who are logged-in members can place reservations on library items.
- Bibilio basket:Logged-in members can select records from an OPAC search and retrieve them by e-mall, either in human-readable form or in an ISO2709-format file. An ISO2709 file can be processed using bibliographic software like End Note.
- OPAC users can submit suggestions for acquisition. Koha automatically informs the OPAC user (by e-mall) of the action taken on each suggestion.

22. Koha Delegation of Authority:

The administrator can allot one or more of the following capabilities to each staff member:

- Super-librarian: access to all functions.
- Circulation: carry out circulation tasks.
- Catalogue: search the catalogue.
- Parameters: administer the system parameters.
- Borrowers: manage the public users (addition, modification, restriction, etc.).
- Permissions: administer staff access to functions.
- Reserves for others: place reserves on items for any borrower.
- Reserves for oneself: place reserves for oneself
- Loan: loan items to borrowers.
- Cataloguing: manage the catalogue.
- Charges: manage the fines and fees levied against members.

Koha Members Module:

- The members (borrowers) module makes it possible to manage not only individual borrowers, but also institutions.
- Each member belongs to a category. The member category defines:The minimum and maximum ages for members of the category• The cost of placing a reservation on an item (when it is applicable in the library)• The rules of circulation.
- By entering the borrower's library card number into the librarian interface, the librarian can: See the financial standing of the borrower (charges due). See the borrower's reservations, and his/her outstanding loans. Set permission flags (for the librarian members).

Koha Circulation module:

- Borrowing a book from any branch (not just the branch where the borrower first registered)
- Returning an item at any branch
- Reserving an item for at any branch.
- Circulation rules can be defined very finely by the library: for each member category, item category, and holding branch of the item, the duration of the loan and the maximum number of books loan able can be defined.
- Returning items ("checking-in") is extremely easy: Simply scan the barcodes of the items being returned.

Koha Cataloguing Module:

- **MARC Management:** The cataloguing module is one of the principal strong points of Koha. Several "frameworks" can be defined to do different cataloguing for monographs, electronic resources, periodicals, etc.
- **Export/Import:** Importing records in ISO2709 format (the MARC reservoir) and through Z39.50 (client) for fast cataloguing.
- **Copy records:** One or more copy records can be attached to each bibliographic record.
- **Fast cataloguing:** To accelerate cataloguing, Koha provides, Management of a MARC record reservoir, in ISO2709 format, A Z39.50 client that can access several Z39.50 servers
- **MARC view and simple view:** Catalogue data can be displayed in MARC format, in simplified form.
- **Searching:** Searches can be performed on any MARC field. Advanced functions, search on one word, the beginning of the field, greater than, less than, etc are also available.

Koha Serials Module:

- It is possible to register subscriptions with reviews, and to track the arrival of periodicals.
- Koha manages late issues, skipped issues, and claims with the suppliers.
- Koha manages complex classifications, allowing the librarian to work with eleven different publication periods (from daily newspapers to annual publications), with delayed publications, and with publications out of sequence.
- A state of the collection can be defined which will synthesize the missing publications, received publications, etc.
- The state of the collection can be displayed differently in the OPAC and in the librarian interface.

Koha Acquisition Module:

- Simple acquisitions:
- The simple acquisitions module makes it possible to acquire materials and add them directly to the catalogue. It does not manage budgetary matters, the orders placed with the suppliers, etc.
- Full acquisitions:
- The full acquisitions module makes it possible to manage: Budgets and book funds: Budget available, Committed, Spent Suppliers. Orders, via 'shopping baskets'.

Koha Personalization:

- The architecture of Koha divides the software into three different layers..
- The database layer, which manages access to the DBMS (database management system)
- The processing layer, which manages the processes required by the user
- The formatting layer, which contains templates for the HTML presentation
- The visible interface of the software is thus entirely customizable. Koha's Intranet and OPAC by selecting from several 'themes'
- The librarian interface uses cascading style sheets (CSS). It is more coherent and easier to follow than was the case in version 2.0.

Koha Operating Parameters:

Koha allows you to set various parameters which control the operating environment of the library:

Library branches: defining branch categories, branches, and contact information.

Item types: Define library items. set rental charges of any amount to users for borrowing items.

Not for loan" for item types such which do not leave the library; issuing

Define Borrower Categories: Set "Category Codes", "Descriptions", "Enrollment Periods", "Upper Age Limit" and "Age Required" for each user type;

Issuing rules: define issuing and fines based on borrower categories, item types, and circulation units (matrix-based rule set);

Stop words: improve list all of the words Koha should ignore when performing catalog searches or building the index

Z39.50: define servers for searching using Koha's Z39.50 client (for cataloging); to add servers, enter the domain name or IP address of the server, the port number to use, and the name of the database to access.

Book funds: set up accounts that keep track of expenditures for library materials.

Koha Back-up Software:

- SSH-tunneled MySQL replication.
- Database dumps using the MySQL dump utility
- On the hardware level, the production system utilizes a two-disk RAID 1 configuration for data redundancy in the event of single-disk hardware failure. The system partitions use the Raisers journaling file system which provides another point of data redundancy.

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Health Information Dissemination: Role of Libraries

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Abstract: *The present study proposed to examine the role of libraries in the dissemination of health information of urban women in Vijayapura city. Health is a basic human right and is essential for a social and economic development. Increasingly, health promotion is being recognized as an essential element of health development. Health awareness is a basic prerequisite for leading comfortable life. For this study Random sampling method has been used to select the target population. Hundred and ten questionnaires were distributed and ninety two duly filled in questionnaires were received. The data was analyzed by using Statistical Package for the Social Sciences (SPSS).*

Keywords: Health Information Dissemination, Libraries, Urban Women, Vijayapura

1. Introduction:

Health is an important area for which women need information support system. Women should know how to take care of their personal health. They must be informed about various health care programmes to keep their children and other family members away from diseases [Sen, 2004]. Health awareness is a process which effects changes in the health practices of people, knowledge and attitude related to such changes. Health awareness is closely connected with imparting of knowledge to the people about the principles of hygiene. It educates people for preserving and developing their physical and mental health. Health awareness is a basic prerequisite for leading a comfortable life. It is true that, one shouldn't diagnose on their own, but at least one can take precautions to keep the routine disease away by reading health related information.

In the context, library and information centre plays a significant role in disseminating or creating health awareness among users at large. Libraries have been playing a vital role in disseminating health information to the society at large and making more information consciousness than ever before 'Health is Wealth'. Libraries particularly medical based information system collect, organize and provide access to health related information and thus help the society in creating and disseminating health information/ awareness among the people.

Health may not be everything but everything without health is nothing. Thus World Health Organisation's (WHO) constitution proclaims, the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being. It means the attainment of the highest possible level of health by all.

2. Health profile of Vijayapura District:

Vijayapura city, formerly known as Bijapur, is the district headquarters of Vijayapura District of Karnataka state. Vijayapura district consists of five taluks viz., Basavana Bagewadi, Indi, Muddebhihal, Sindagi and Vijayapura. The city has population of 326,360 as per 2011 census among which male population is 1,65,122 and female population is 1,61,238. Total literacy rate of the city is 73.42 (239631) which is less than the state literacy rate (75.36) and the literacy rate among men is 77.89 (128615) and among women it is 68.85 (111016) which slightly higher than the state literacy rate (68.1) among women. In Vijayapura district health care facilities and services are made available and accessible through CHCs, PHCs and taluk hospitals in rural and urban areas can be noticed. The PPP mode has improved overall healthcare facilities and services in Vijayapura district. They do provide highly advanced health services and also encourage health tourism in the city. Besides this, there are hundreds of private hospitals that provide health care services. The city has many multi-speciality hospitals and a range of isolated specialised clinics - children specialists, ENT, dermatologists, maternity, neurologists, psychiatrists, orthopaedics etc. Besides this the city has many blood banks, ambulance services, pathological and diagnostic laboratories, health clubs, nursing homes, maternity homes, pharmaceutical vendors, health care instrument vendors and hundreds of medical shops. Every agency is committed to provide mandatory information to the community itself.

3. Operational Definitions:

Health: The term 'health' is viewed differently by different people and authority all over the world. The WHO defined health as a state of complete physical, mental and social well-being and not merely an absence of disease or infirmity. This definition is well accepted. Good health, being a synthesis of physical, mental and social wellbeing, the definition of health has to extend not only to physical fitness but also to the simultaneous psychological and spiritual well being.

Information: Information is the symbolic element used for communicating knowledge, irrespective of their nature, material carriers, form of presentation, etc. It refers to both substance and contents of documents and to physical existence, the term is used to designate both the message and its communication. The term has been widely accepted as the cognitive state of awareness given representation in physical form. This physical representation facilitates the process of knowing. Information can be found in a range of forms, from the written words (books, periodicals and other forms including microfilm) to audio-visual (TV, Radio, Movies, etc.) to purely oral communication (such as consultation, sessions, seminars, workshops, symposia, etc.). Information is considered as the very basis of our existence. It is a vital resource for all round development of the society. In every sphere of activity people are dependent on information.

Health information: Health information, thus serves as a tool, which facilitates more information and better decision to be made, and it helps to identify problem areas and to take timely remedial measures. The term health information has been defined in different ways. In many countries, the term is interpreted to mean health statistical, epidemiological and other health oriented data used in the planning and management of health services by the decision makers and administrators. General public needs information on different areas and aspects of health care.

Health information dissemination: Health information is disseminated by the professionals for different purposes in different modes. Health Information products and services are available, these cannot reach the end-users unless there is a good mechanism for disseminating such information. In our country, the information needed for rural and urban development, are disseminated by various agencies either through formal publications or through designated officials or through libraries and information centers. But the mechanisms are not well established and well developed. The available information often does not reach the end-users at proper time.

Health information dissemination to women: Women get health information through various sources that are often not geared to their specific requirements. NGOs and the Government departments generate information about

women health. The ICT based information systems give pertinent information concerning the rural and urban sector activities but these are still general in nature. Family members and friends are often the main source of information [Dasgupta, 2003]. The mass media provide indirect, one-way communication and include community, national and international radio and television as well as newspapers, magazines, comic books, cinema or other situations where a large number of people can be reached with information without personal contact [Mineaction.Org, 2005]. By and large, health information can be disseminated in women through a variety of media.

This section presents the features of the health information sources. The channels highlighted include mass media (e.g., radio, television, teletext, videotext, newspapers, magazines, comics), human resources (e.g., family members, friends, neighbors, druggists, nurses, librarian, primary healthcare workers, social workers, doctors, Health workers, consultants, etc.,), information service systems/ institutional resources (e.g., libraries, Government organization, NGO, Health institutions, women organization, nature care centers), training and educational programs (e.g., professional preparation, workshops, computer-assisted), internet (online databases) and other (e.g., posters). For providing the necessary health information support required by women, a proper information dissemination mechanism has to be designed. At present the information is disseminated in the form of product and services. It normally supports women in common. They get information from various sources. The channels of information available to them are both formal and informal. The formal channels include radio and television, local Government information office, primary health care workers, and public library. The informal channels on the other hand constitute Village or Ward Heads and other elite group in the community. Friends and relatives, physicians, nurses, social workers, health workers as well as Non-Governmental Organizations (NGOs) particularly the Women, have been cited as important informal channels of information [Saleh and Lasisi, 2011].

There are number of publications or collections are available in library, which help in the dissemination of health care information to the users. Libraries have various collections related to health. Daily newspapers which help in educating the users related to health. Health related journals/magazines are available in library. Separate collection for women and health magazines also subscribed by the library. Besides the above dailies newspaper, journals, magazines, there are also available books and other publications are available in libraries. These publications are helpful to the library users. It is agreed that health and its related publications, documents and other literatures have a vital supportive role to

play in building health infrastructure and in providing valid, timely and relevant information about development in the health services.

4. Objectives of the study:

Objectives of the study are

- To find out the health information needs of urban women in Vijayapura city
- To identify the preferred sources for collecting health information by the urban women
- To identify the role of libraries in disseminating health information of urban women in Vijyapura city

5. Methodology and study population:

The study has been undertaken to identify the role of libraries in the dissemination of health information of urban women in Vijayapura city. The study population comprises of urban women in Vijayapura city. The study adopted survey method, and questionnaire was used as a tool for collection of data. A structured questionnaire has been designed keeping in view the set of objectives. It was distributed to 120 respondents, out of which 92 respondents have responded positively. The data collected was fed into SPSS and simple frequency calculation has been used to analyze the data.

6. Results:

I. General Information

Table-1: General Characteristics of Urban Women (N=92)

General Characteristics	Numbers (%)	General Characteristics	Numbers (%)
Age		Educational qualification	
Less than 25	13 (14.1)	Illiterate	02 (2.2)
26 to 35	37 (40.2)	Primary Education	09 (9.8)
36 to 45	33 (35.9)	Secondary Education	23 (25.0)
46 above	09 (9.8)	Diploma, Degree & above	58 (63.0)
Category		**Marital status**	
GM	42 (45.6)	Single	43 (46.7)
OBC	18 (19.6)	Married	49 (53.3)
SC/ST	32 (34.8)		

Table -1 shows general characteristics of urban women. Large number of women under study belong to the age group of 26 to 35 years (40.2%, N=37) and 36 to 45 years (35.9%, N=33), more than fourteen percent (14.1%, N=13) of them are aged less than 25 years and only 9.8% (N=9) are aged above 46 years. It is found that majority of women under study have diploma or degree to their credit (63%, N=58). With regards to educational qualification, 25% (N=23) of women have completed their secondary education and 9.8% (N=09) have completed their primary education, while a very small proportion of women (2.2%, N=2) are illiterate. The study population comprises of 45.6% of GM (N=42), 34.8% of SC/ ST (N=32) and 19.6% of OBC (N=18) women. It can be analysed that more than 53% of women under study are married (N=49) and the remaining 46.7% (N=43) are single. This group includes unmarried, widows, divorcees and those who are staying separately.

Table-2: Health information needs of urban women (N=92)

Health information needs	Numbers (%)
Skin diseases	45 (48.9)
Malnutrition	16 (17.4)
Pregnancy	24 (26.1)
Dental problems	19 (20.6)
Cancer	04 (4.3)
Sexually transmitted diseases	08 (8.7)
General Health Problems	38 (41.3)
Sexual problems	12 (13.0)
Sanitation	29 (31.5)
Nutrition	41 (44.6)
First Aid	39 (42.4)
Family panning	31 (33.7)
ENT problems	24 (26.1)
Menstrual cramps	39 (42.4)

One of the objectives of the study is to know the health information needs of urban women. Various types of health information needs have been listed. More than forty percent of the respondents indicates that skin diseases (48.9%, N=45), nutrition (44.6%, N=41), first aid and menstrual cramps (42.4%, N=39), general health problems (41.3%, N=38) are the top five information needs of urban women. 33.7% (N=31) of the respondents need information on family planning, 31.5%

(N=29) need information on sanitation, 26.1% (N=24) need information on ENT problems and pregnancy. Dental problems (20.6%, N=19), malnutrition (17.4%, N=16), sexual problems (13%, N=12), sexually transmitted diseases (8.7%, N=8) and cancer (4.3%, N=4) are the least health information needs preferred by the urban women.

Table-3: Preferred sources for collecting health information (N=92)

Preferred sources	Numbers (%)
Radio	07 (7.6)
Television	53 (57.6)
Newspaper	22 (23.9)
Internet and E-resources	36 (39.1)
Human resources	61 (66.3)
Institutional resources	30 (32.6)

After analyzing the preferred sources for gathering health information, it is found that more than 66% (N=61) of the respondents prefer human resources for gathering health information, 57.6% (N=53) prefer television, 39.1% (N=36) prefer internet and e-resources, 32.6% (N=30) prefer institutional resources, 23.9% (N=22) prefer newspaper and 7.6% (N=7) of women prefer radio for gathering health information.

II. Use of Library

Table-4: Use of library

Use of Library	Numbers (%)
Yes	32 (34.8)
No	60 (65.2)
Total	**92 (100.0)**

From table 4, it can be analysed that a greater majority of urban women (65.2%, N= 60) do not use library. It can further be analysed that a very small proportion of women (34.8%, N=32) use library.

Table-5: Library Membership

Library Membership	Numbers (%)
Yes	12 (37.5)
No	20 (62.5)
Total	**32 (100.0)**

From table 5, it can be analysed that only 12 respondents (37.5%) have become members of the library. Most of the women have not taken any membership of the library.

Table-6: Library preferred to visit

Libraries	Numbers (%)
Public Library	04 (33.3)
School Library	00 (0.0)
College Library	02 (16.7)
University Library	06 (50.0)
Special Library	00 (0.0)
Total	**12 (100.0)**

From table 6, it can be analysed that 6 (50%) of the respondents preferred to visit university library, 4 (33.3%) of the respondents preferred public library and hardly 2 (16.7%) of the urban women preferred college library for gathering information.

Table-7: Frequency of visit to the library

Frequency	Numbers (%)
Daily	00 (0.0)
Once in a week	01 (8.3)
Monthly	02 (16.7)
As & when required	09 (75.0)
Never	00 (0.0)
Total	**12 (100.0)**

Table 7 depicts the frequency of visit to library by urban women. Nine (75%) respondents visit to the library as and when required. Two (16.7%) respondents visit library monthly and only one (8.3%) respondent visits library once in a week.

Table-8: Reasons for not visiting the library

Reasons	Numbers (%)
No library available	00 (0.0)
Not interested	06 (10.0)
Lack of time	29 (48.3)
Information available on fingertips	25 (41.7)
Total	**60 (100.0)**

Table- 8 provides the reasons for not visiting the library by the respondents. It can be found that twenty nine of the respondents quoted lack of time (48.3%) is the reasons for not visiting the library, information available on fingertips (41.7%, N=25) and non interest (10%, N=6) are quoted as the reasons given by them for not using library.

Table-9: Usage of libraries to get health information

Usage	Numbers (%)
Yes	05 (41.7)
No	07 (58.3)
Total	**12 (100.0)**

From table 9, it can be analysed that a greater majority of urban women (58.3%, N= 7) do not use libraries to get health information. It can further be analysed that a very small proportion of women i.e only five respondents (41.7%) use libraries to gather health information.

Table-10: Documents used for getting health information in the library

Documents	Numbers (%)
Newspaper (Health related article)	02 (40.0)
Health magazines	02 (40.0)
Health/Medical books	00 (0.0)
Publicity materials form health organizations	01 (20.0)

A question was asked to urban women to know the document used for gathering health information in the library. Hardly two (40%) respondents use newspaper (health related article) and health magazines for gathering health information. Only one (20%) respondent use publicity materials form health organizations.

Table-11: Satisfaction with the health information got from the library

Satisfaction	Numbers (%)
Yes	05 (41.7)
No	07 (58.3)
Total	**12 (100.0)**

A question was asked to know to satisfaction with the health information got from the library and the data is tabulated in table 11. It is found that hardly five (41.7%) of the respondents satisfied with the health information got from the library.

Table-12: Problems faced in accessing health information (N=92)

Problems	Numbers (%)
Lack of time	38 (41.3)
Lack of motivation	27 (29.3)
Health is not a priority	08 (8.7)
Lack of money	10 (10.9)
Lack of Health literacy	42 (45.6)
Busy with family responsibilities	36 (39.1)
Not supported by the family members	11 (11.9)

Urban women under study were asked to mention the problems that they have faced in accessing health information. From table 12, it is found that women faced more than one problem. More than forty five percent of the women quoted lack of health literacy (N=42). Lack of time is also quoted as a problem by another 41% (N=38) of women. Busy with family responsibilities (39.1%, N=36), lack of motivation (29.3%, N=27), not supported by the family members (11.9%, N=11), lack of money (10.9%, N=10) and health is not a priority (8.7%, N=8) are also cited as the other problems by urban women.

7. Conclusions and Recommendations:

The technology trends will lead to many new developments throughout the Health Information value chain. Health awareness development i.e. development in the fields of nutrition, sanitation, community health, prevention of water, food, air pollution are needed. For providing the health necessary support required for women development, a proper information infrastructure has to be developed. The government produce a good amount of health information. Such information should be quickly brought to the notice of the users through the proposed facilities.

Health awareness among women should be created about the different types of reading materials as sources of health information. Librarians should take interest in providing health information to their users. Libraries should acquire health related materials to provide health information services to their users. It is quite obvious that no library and information centres are self sufficient to fulfil the needs of the user community. They generally face either one or other problems in the existing system or set-up, in that health related collection also one of the problem. Libraries should disseminate health care information such as health and nutrition, family welfare, public health, health schemes, health care facilities, communicable diseases, etc., effectively to the library users at the right

time. Accurate health care information should be transmitted through libraries, electronic media, print media, traditional media, or camp, conference, seminar, symposium, publicity frequently as and when necessary. Some good local health journals/ newsletters in the local language should be subscribed by the library so that the library users may have access to make themselves conscious about health. Health awareness programmes should be organized by the local clubs/ organisations from time to time in collaboration with concerned authorities. The recent trend in information flow is through wall writings, documentaries are also used to disseminate the information to the library users.

Awareness programmes on various diseases and health issues may be conducted at the premises of the library, with the involvement of the women. Library may arrange outreach programs – exhibitions, displays, film shows, and lectures by experts, jointly with NGOs, extension workers, community clubs and other professional groups on health related issues. The focus should be on improving health information exchange through better information systems and services so as to provide right information to the right people in the right format and at the right time.

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Information Consolidation and Dissemination Activities and University Libraries in Digital Environment

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Abstract: Describes the significance of IACRD activities. Identifies the users and their needs in a university environment. Describes the changing role of university libraries. Lists the various information services to be provided and products to be prepared by university libraries. Based on a content analysis of websites lists the information services and information products of university libraries. Observes that many of these are elementary stage products and services. Concludes that university libraries have either to start IACRD activities or face the danger of being overtaken by other agencies.

Keywords: Information Consolidation, IACRD, University Libraries, Digital era

1. Introduction:

Information analysis and consolidation activities (IACRD) are not new to information professionals. Handbooks, manuals and data compilations can be cited as examples for information products of earlier periods. The term 'Information Analysis and Consolidation' (*Seetharama*, 1997) includes "selection, evaluation, analysis, interpretation and synthesis of a body of information in a clearly defined subject field with the intent of compiling, digesting, repackaging or otherwise organizing and presenting pertinent information in a form most authoritative, timely and useful to the varied requirements of the different categories of users." Information Consolidation activities are very much practiced in special library environment to meet the specific requirements of the user community. But the importance of universities towards research is changing quite radically. Now universities are recognized as one of the most important centers to conduct research activities.

The accreditation process of NAAC, ranking of universities, MHRD's attitude towards research in universities, the concept of university – industry linkage all stress on the significance of quality research in the university environment. This necessitates the university libraries to design various information consolidation and dissemination products and services to support the researchers. There is a need for university libraries to undertake these activities. Hence an effort is made in this article to discuss these issues.

2. IACRD activities in Digitized era:

In the digitized environment information (either born or converted) will be analyzed, consolidated, repackaged and disseminated to the user with timely, authoritative, evaluated information in digital form only. Information in a clearly defined specific subject field indexed, abstracted, translated, reviewed, synthesized and evaluated will be provided to the user groups with digested, digitally organized and repackaged information in the digital form only. The major activities include analysis, interpretation, synthesis, evaluation, and repackaging of digital information for the purpose of assisting the users with tailor made information of a specific field in a digital form.

These activities will be done as a team effort as in the case of print information. Teams formed with different groups of specialists possessing skills and techniques to analyze, evaluate and synthesize digital information. New evaluated digital information in the form of critical reviews, state of the art monographs or data compilations will be made accessible to the user groups on-line. The IACRD activities will be carried out basically with digital information (online/offline, open source/proprietary etc) in a particular subject field.

3. Users of IACRD and their needs in a University Environment:

A university is an institution of higher education and research which grants academic degrees in various disciplines. Universities typically offer undergraduate, postgraduate and doctoral programs. The word "university" is derived from the Latin 'universitas magistrorum et scholarium', which roughly means "community of teachers and scholars."

A University library is an academic library that is attached to a higher education institution which serves two complementary purposes to support the curriculum, and to support the research of the university faculty and students (*Curzon and Jennie, 2009)*

The users of information consolidation services in a University environment may be classified into the following groups:

PG Students

Research scholars

Policy makers/Decision makers/Administrators

Intermediaries

Community groups

Post Graduate Students:

A Post Graduate student is a one who continues to study for an advanced degree after earning a bachelor's degree or any other first degree. It involves learning and studying for academic or professional degrees, academic or professional certificates, academic or professional diplomas, or other qualifications for which a first or bachelor's degree generally is required, and it is normally considered to be part of higher education.

Graduate education programs at research universities, through the curricula, degrees, supporting services, and program offerings, are responding to these challenges. Research universities are increasingly concerned with building comprehensive programs for their graduate students that focus on quality of life, professional development opportunities, and alternatives to traditional career routes, in addition to curriculum and academic development. The research library must be a key partner in this changing environment (*Covert- Vail and Collard,* 2012).

Research Scholars:

A researcher, is a person who performs research - the search for knowledge or in general any systematic investigation to establish facts. Researchers can be M Phil or Ph D students or Post Doctoral students working in PG Departments or research centres or they can be Project Assistants or Research Assistants working under different funded or sponsored projects. They may also be academicians engaged in teaching and research activities. They may be involved in gathering knowledge about the subject of study. Retrospective searching is also required.

In University Libraries we can find Ph D Scholars, M Phil Scholars, teaching faculty and other Fellows who are more involved in research work. They are in regular use of information may be scientific or technological which will be helping them in teaching and research activities.

Policy Makers/Administrators:

Vice Chancellor, Registrar, Registrar (Evaluation), Finance Officer, Deputy Registrars, Deans of Faculty, Heads of the Departments and other non teaching staff covering the whole universe from highly educated to illiterate levels. This implies that the nature of information required must also be diverse.

In order to provide planning, operating and control information to decision makers, information analysis and consolidation centres should be so developed as to provide information pertaining to policy making, decision making, planning, control, etc.

Communicators/ Intermediaries:

The Library staff and extension workers act as intermediaries functioning as development functionaries for establishing liaison between the generators/ innovators and the actual beneficiaries or end users. Other intermediaries in other contexts may be teachers, mass media personnel, etc. Whatever be the type of intermediary, their objective is to help people to help themselves.

Community Groups:

It includes self organized network of people with common agenda, cause, or interest, who collaborate by sharing ideas, information and other sources. They are the cluster of common interests that arise from association. Community groups within the gamut of university libraries include Alumni, Citizens, local colleges and schools, government officials and other people who are in need of information.

4. The role of University Libraries:

Libraries are organized collection of monographs, periodicals and other sources of recorded information. They commonly include catalogues, directories that provide factual information and indexes which help users to find information in other sources for the last few years, libraries started providing access to information in electronic formats such as World Wide Web and online databases. The traditional role of libraries has always been as an intermediary between the information producer (and publisher) and the user. In the digital environment also the role of library remains the same.

5. e-Information Services:

In order to satisfy the different needs of the users in a university environment

various types of information services are to be planned, organized and provided to the users based on analysis, consolidation, repackaging and dissemination of information. In the digital age, the most common library user information services starts from the personal oral or written communications between librarians and library users: Traditional library user information services have the following major features: Face to face personal communication includes eye contact, facial expression, oral communication, and written communication. Onsite communication includes, campus outreach coordination and collaboration, library tour, ready reference, user technical support and virtual reference Electronic library user services include the Internet and the worldwide web, computerized library catalogs, digital libraries, distance learning services, e-databases, government, instant message services, interlibrary loan and virtual references. The different e-information services are:

6. e-Reference Service:

e-Reference service is one of the most popular services in the library. In this service the query of the user is solved and satisfied by the reference officer, who refers the user to the e-documents from where the query of the user can be solved. Here reference transactions are information consultations in which the library staff recommend, interpret, evaluate, and/or use information resources to help the users to meet particular information needs. Reference transactions do not include formal instruction or exchanges that provide assistance with locations, schedules, equipment, supplies, or policy statements. The reference work includes reference transactions and other activities that involve the creation, management, and assessment of information or research resources, tools, and services digitally.

Creation and management of e-information resources includes the development and maintenance of research collections, research guides, catalogs, databases, web sites, search engines, etc., that the users can use independently, in-house or remotely, to satisfy their information needs. The assessment activities include the measurement and evaluation of reference work, resources, and services (ARL).

e-Referral Service:

e-Referral service is another important service provided in libraries. Here the process involves referring to some other e-sources where the possibility of getting the information increases. A directional transaction is an information contact that facilitates the logistical use of the library and that does not involve the knowledge, use, recommendations, interpretation, or instruction in the use of any information sources other than those that describe the library, such as schedules, floor plans,

and handbooks. It needs to maintain tertiary sources of information as well as secondary sources like e-directories, union catalogues, web OPACs etc.

e-Literature searches and preparation of webliographies:

e-Literature search plays an important role in the library. It is the very first step of a research pursuit which requires time, labor and expenditure. Due to huge growth of literature which is wide and scattered, current literature is not adequate. The e-literature published already in the past has to be traced within the required time span.

Heliography is an enumerative list of hypertext links and a gateway to the scientific sources of information on the net, whether annotated or not. It is a critical guide to electronic resources for Poe research of the World Wide Web and CD-ROM, including electronic texts, HTML-encoded texts, hypertexts, secondary works, commentaries, and indexes. Webliographies are digital equivalents of bibliographies.

e-Alerting Service:

There are different e-alerting services one of which is e-Current Awareness Service. This service keeps the seekers of information abreast with the latest development in their respective fields. It provides general and quick service for the community or group. It covers a larger area of literature. Another alerting service is Selective Dissemination of Information. This service is referred as Current Awareness Service with a difference. It is provided in response to a particular query of an individual. It is exclusively restricted to area of researcher's interest.

The different forms of CAS in digitized era would be List of e-journalsp being accessed, Current Contents Service, Current Awareness List, Library Bulletins, Announcement of Research in Progress, Notification of forthcoming meetings, notification of current papers, notification of research in progress, notification about conference, daily intelligence service, newspaper clippings, and trackers . These services could be provided through group e-mails, e-forums and through social networks. These systems provide automated searches that inform the user of the availab[illegible]f new resources meeting the user's specified keywords and search par[illegible]s. Alerts can be received by a number of ways, including e-mails, RSS feeds, voice mail, instant messaging and text messaging.

e-Technical Enquiry Service:

e-Technical enquiry service is one of the important services which are devoted to areas of industrial development of a nation. It elicits vital information by the scientists regarding the implications of certain projects. Here, the information

alerts the concerned stakeholders. A e-technical query is a query which is related to mechanical/ industrial arts and applied sciences that emanates from the specialists. The nature of query in e-Technical Enquiry Service is specialized and is related mostly to specific industries, Laws and regulations.

e-Document Delivery System:

Here documents are delivered in the digital format, like Digitized, CDROM, etc. The system using optical disc based technology or online computerized databases for receipt of requests and supply of the documents. It requires storing of documents in digital format. Digital system allows identifying of e-documents to assess utility in advance of requesting the entire item.

e-Translation Service:

In e-translating service translating of digital literature in English and Non-English languages will be carried out. In the translation process the language expert system analyses the given text in the source language from various view points including grammatico-morphological structure of the sentence, semantic, stylistic, terminological and comprehends the information content in the source language. Each translation is checked meticulously for completeness and correct use of terminology. The text is edited by a second linguist expert system. This is recommended particularly for technical literature translations. Translations are done and access is provided in digital form only.

Other types of e-information services:

These are provided on demand to the users. These include patents information, standards information, condensation and differential presentation, abstracts, extract, digest for management, digest for technical division, digest for operator/ technician, technical note, product information bulletin, commercial intelligence, market information, forecasts and trend notes, company profiles, notification of contracts and tenders, technology transfer information, new innovation, MIS, techno-economic surveys, data service, information analysis and products, critical compilations, information package, reprography, exhibition organization, editorial and technical writing, preparation of charts, maps, organization of seminars, workshops, etc.

7. Information Products:

Information products include all books, reports, etc. In the internet context, the term refers to electronically deliverable, knowledge-based goods. If it

delivers knowledge and if it can be sent through e-mail to the user or offered as a downloadable file, then it qualifies as an information product. Information products are files on your hard drive that you send out electronically, tutorials, e-books, etc. The different kinds of information products are e-books, e-zines and newsletters, reports and research data, tutorials, courses and help files.

House Journals:

The information products like House Journals is a form of promotional literature for informing the public about performance, style of functioning of organizations. The different forms of house journals are external house journal, internal communication, internal house journals which are distributed to selected group of readers. But the contents of the journals vary. It may take the form of digital house journals that may be sent via e-mails, group mailings and social networks

8. Newsletters:

The newsletter is one of the modest publications with limited pages. It is simple in format, crisp in style. It is very speedy information for definite audience group. It supports fragmented interests of the users and is a source of information for grey literature. It provides much of the current information to a restricted group. It may also take the form of digital house journals that may be sent via e-mails, group mailings and social networks.

The digital formats vary from the simplest format, text to highly designable formats like Portable Document Format (PDF) and HTML. The use of more formatting and web2.0 attributes like video and sound have become a market standard all over the world.

9. Trade and product Bulletin:

Theses information products are issued in tremendous variety of forms to describe and illustrate their goals and services. These are very technical in nature and the purpose is to keep informed. It contains application orientation and descriptive information or product description. It is directed at a specialized audience of some sophistication.

State of the art report:

There is no encompassing and historical orientation regarding State of the art report. It emphasizes recency and up-to-datedness' and describes a very recent situation. It more timely than traditional class of reviews, generally it is prepared

for and oriented to a restricted audience on demand and are marketed at high prices. It is mostly prepared on technological topics, business and commerce. The highest level of development as of a device, technique, or scientific field, achieved at a particular time

Trend Reports:

A trend report fulfils the specific requirements of the specialist readers. It provides exposition of a subject giving an account of the general direction of research in the subject based on a review of the documents on current developments. It is designed to help the specialist reader in the productive utilization of his time and in the conservation of the research potential. It identifies the trends in the field.

10. Appropriate repackaging activities:

Professionals like Vice-Chancellor, Registrars, Deputy Registrars, Deans of faculty, Heads, Middle level Administrators, and such other professionals who are involved in policy making, planning and administrating are interested in information products like subject interest bulletins, literature reviews, state of the art reports, newsletters, progress reports etc. People like curriculum designers, subject specialists, writers, trainers who are involved in designing curriculum are basically interested in information products like actual teaching/learning curriculum materials, guides, textbooks, syllabuses, multimedia packages, newsletters, subject interest bulletins, research abstracts, handbooks, etc.

Trainers, trainees, supervisors, resource persons, who are involved in personnel and teacher training are interested in actual training materials, audio-visual aids, multimedia training kit, training syllabus and designs, newsletters, research reports of teachers training programs, subject interest bulleting, data sheets, handbooks, yearbooks, etc. Faculty members who are involved in teaching, are interested in subject interest bulletins, guide books or handbooks on teaching methodologies, sample lessons and learning materials, teachers and pupils guides, textbooks, syllabuses, audio-visual kits, multi-media packages for classroom teaching, data sheets, newsletters.

Researchers, faculty members, academicians, students, project evaluators, who are involved in research and evaluation, are interested in information products like manuals on research and evaluation methodologies, year books, data sheets, handbooks, research reports, abstracts, research journals or bulletins, newsletters, etc.

Hence, at the operational level, information consolidation products are prepared at various stages. It requires a methodology involving identified different procedures. Though informational needs of the user groups, their characteristics, their major functions, objectives of the parent institution, and activities of the information centres and the availability of digital resources will be considered in preparing Information Consolidation Products (ICP), the information needs of the users constitute prime criteria for the preparation of an ICP. *Saracevic* and *Wood* (1981), have observed that preparation of information consolidation products are related to the information needs in different stages of the diffusion process and diffusion can be categorized into five stages or phases namely, awareness, interest/ knowledge, attitude formation, trial/decision, and adoption/confirmation.

11. Present Status of University Libraries:

From the analysis of the 54 websites of University Libraries it is found that the following information services are provided to the user community

- **Reference sources: encyclopedia/ Dictionaries/Academics**
- **Writing style guides**
- **Bibliographic services**
- **Paper clipping service**
- **Ask a Librarian**
- **Reference Service**
- **Question point service**
- **Referral service**
- **Career guidance service**
- **Document delivery service**
- **Resource sharing**

The University libraries have following information products designed for the benefit of user community

- List of E-resources in the University Library
- List of UGC Infonet e-journals, Databases and e-books
- List of Statistical databases
- **Latest additions bulletin**
- **Old question paper databank**
- **Journal through DOAJ**
- **Books through DOAB**

- **Directory of faculty**
- Workshop/seminar/conference organized by University
- Web OPAC
- **New arrivals**
- Alert service through e-mail
- Institutional Repositories
- Library URLs
- **E-thesis and dissertations catalogue**
- **Directory of university faculty**
- **Newsletters**

12. Conclusion:

There appears a huge divide between what the published literature expects the IACRD activities be and what is being provided by the libraries. IACRD activities are very much essential in a university environment and these play a vital role in digital environment. A wide variety of services can be provided and a range of information products can be developed. *Seetharama* (1997) lists the following IACRD products to be provided in University environment.

- **Awareness stage**: Journal notices, short announcements in professional newsletters, acquisition notices.
- **Interest/ Knowledge stage**: State-of-the-art and critical reviews, synthesized research result, referral journal articles, text excerpts, critical data, data survey.
- **Attitude Formation stage**: Synthesis if critical reports and evaluations, comparative results, resource requirements information.
- **Trial/Decision stage**: Research data, training/education materials, know-why information, experiences at other institutions.
- **Adoption/confirmation stage**: Continuing synthesized SDI reports, selective current contents, and refinements in advances critical data.

But the reality is that many university libraries haven't recognized the need for IACRD activities and those that are undertaking IACRD activities haven't gone beyond first stage. From the analysis of the list provided by *Seetharama* it can be observed that among the universities investigated a majority of them provide awareness stage information consolidation products. Consolidation products of other stages are not being provided by university libraries except isolated examples. Many of the products are more compilations/aggregations. The university libraries are still in infancy stage. This indicates the very fact that

IACRD is a neglected area in University Environment. This is an opportunity for them to establish the importance of university libraries. Otherwise the university libraries have to face the threat of perishing.

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Internet Resources and Services for Social Scientists

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Abstract: Internet has brought in lot of positive developments to the scholarly world. Today, it is possible to access e-journals, e-databases, e-books and any kind of information just by having an Internet connection and a subscription in a few cases. In this paper an attempt has been made to list out certain important free and open access internet resources useful for social scientists.]

Keywords: Internet resources, Open access, Free access, Internet services, Social science.

1. Introduction:

We now live in the digital information age andthe Internet has become one of the most powerful resources available to the humankind. Today, it accounts as a source for all kinds of information and it is believed by many, especially millennial's that, if information is not available on the Internet means then it does not exist. In view of its exponential growth, worldwide, the growth of number of Internet users has enormously increased,with 44.8% of them arecoming from Asia alone (Qadir, 2014).

Like in other areas, the positive implications of the Internet are clearly witnessed in the scholarly world. It has brought in new vistas to the way information is stored and accessed. Now most of the scholarly products such as journals, abstracting and indexing databases, statistical databases and many other resources including books have moved in to the online world, where access is provided to subscribers over the Internet. The growth and developments in the Internet technology, has also resulted in the emergence of open access publishing, wherein access to resources is provided at no cost. Open access resources are widespread to all the disciplines and are available in the form of journals, books and databases. Apart from resources, certain services on the Internet have become handy for researchers to undertake their scholarly research work. In this paper an attempt has been made to enlist certain important open access and free resources available in the field of Social Sciences.

2. Review of Literature:

The studies on internet resources and services, like other areas of research are not new to the field of Social Sciences. Raychaudhury and Pal (2001) have enlisted different Internet services and their use in exploring the social science resources. Similarly, Konnur and Pujar (2003) have enlisted statistical information resources available for social scientists on the Internet. Brian's (2005) survey identifies significant internet resources in the selected areas of social sciences and he agrees that it is very difficult to provide

comprehensive list owing to the vastness of the web. Kumar, A et al (2011) have mentioned how the social scientists of Mizoram University are using information sources Thanuskodi and Ravi (2011), studied the use of internet information sources in the field of social science and found that, their usage of print resources is higher thanthat of internet sources. In another study, Qadir (2014)analyzed the use of internet, frequency of its use, availability of information sources and its impact on social scientists of University of Kashmir. Arora, and others (2015), have discussed about open access data service of ICSSR and its reuse of data by the social scientists.

3. Internet Resources and Services in Social Science:

Internet resources and services are galore, some available on subscription and many in the public domain. Owing to the emergence of open access, access to data, grey-literature, journals has become easy, which has somewhat helped in building the digital divide among the researchers working in different regions of the world. Someof the national and international open access and free resources available in the field of social sciences have been enlisted below.

Abstracting and Indexing Services:

India:

ISID Index to Indian Social Science Literature: (http://isid.org.in)

ISID Database indexes Indian social science literature published in 230 Indian Social Science journals. It also serves as an Index to press clippings on diverse social science subjects. Registration is required to access the database.

1.1.1 Open Index Initiative: (http://oii.igidr.ac.in)

Open Index Initiative is an online and searchable bibliographic database for most of the Indian Social Science literature and resources available in Indian libraries. OII indexes selected Indian social science Journals and working papers/discussion papers/ occasional Papers, and thesis/dissertations emanating from Indian social science institutes and departments. The database contains about 79000 records covering more than 12 years' data (2000-2015) (IGIDR, 2016).

International:

1.1.2 ERIC (Educational Resource Information Centre):(http://www.eric.com)

ERIC is the world's most widely used index to educational-related literature. It is the largest education database in the world-containing over 1.5 million records of journal

articles, research reports, curriculum and teaching guides, conference papers, dissertations and theses, and books. Currently it has over 650,000 records from scholarly journals, more than 225,000 records from reports, conference proceedings, and the like, and reference works in excess of 14,000 records. Many of these records contain links to the ERIC full-text documents.

1.1.3 **POPLINE:**(http://www.popline.org)

POPLINE contains the world's most comprehensive collection of population, family planning and related reproductive health and development literature.It consists of more than 380000 bibliographic citations and abstracts to a variety of materials including journal articles and other scientific, technical, and programmatic publications as well as unpublished documents and project reports (gray literature). Most documents published after 2000 contain links to full-text. Many documents are unique to the collection and are unavailable elsewhere.

1.1 **Catalogues, Databases and Digital Repositories**

India:

1.1.1 **E-Social Sciences:** (http://www.esocialsciences.org)

An E-social science is a one stop portal for social scientists providing access to papers, reports, journals, policy papers etc. emanating from India and South Asia. Its subject areas of coverage include both Social Sciences and Humanities.

International:

1.1.2 **Digital Commons Network:** (http://network.bepress.com)

The Digital Commons Network brings together free, full-text scholarly articles from hundreds of universities and colleges worldwide. At present, its index includes 2,106,417 works from 485 institutions. In the area of Social and Behavioural sciences, its database provides access to 324165 full text articles.

1.1.3 **RePEC(Research Papers in Economics):**(http://www.repec.org)

It is a collaborative distributive catalogue of resources in the areas of economics and related sciences. The catalogue covers 1,800 archives from 2,300 journals and 4,300 working paper series. The total number of papers, articles and other type of materials indexed in this database are well above 2200000. Some of its major services include EconPapers, IDEAS, CiteEC, etc.

1.1.4 **Social Science Research Network (SSRN):**(http://www.ssrn.com)

It is devoted to the rapid worldwide dissemination of social science research and is composed of a number of specialized research networks in each of the social sciences. SSRN's e-Library hosts 709,089 abstracts, 596, 956 full text research papers from 327,001 researchers across 24 disciplines. It has been recently taken over by Elsevier publishers.

1.1.5 **SocArxiv:**(https://osf.io/preprints/socarxiv)

This is an open pre-print archive of the social sciences having 633 searchable preprints. It is a new initiative and expected to grow in the coming years.

1.2 Full text Sources:

International:

1.2.1 **Directory of Open Access Journals:**(http://www.doaj.org)

The Directory of Open Access Journals contains 9000 open access journals covering areas of Sciences, technology, medicine, Social sciences and humanities.At present it includes 664 social science open access journals, indexing 198,647 articles published in these journals.

1.2.2 **Directory of Open Access Books:** (http://www.doabooks.org)

The Directory contains 5602 academic peer-reviewed open access books from 167 publishers in the areas of Sciences, Social Sciences and Humanities. The major publishers, whose books have been added in this directory, include ANU Press, Bloomsbury Academic, Brill, etc.

1.2.3 **Open Access Theses and Dissertations [OATD]:** (https://oatd.org)

OATD includes open access graduate theses and dissertations published around the world. Metadata (information about the theses) comes from over 1100 colleges, universities, and research institutions. OATD currently indexes 3,493,598 theses and dissertations in all the areas of universe of subjects.

3.4 Statistical Sources:

In the field of social sciences, statistical sources play an important role in deriving the empirical results. The sources of statistics in most cases originate from different agencies like Government Departments, offices and national and international organizations.

India:

3.4.1 Census India:(http://www.censusindia.gov.in)

Census of India is the largest single source of a variety of statistical information on different characteristics of the people of India. It provides data on demography, economic activity, literacy and education, housing and household amenities, fertility and mortality, religion, caste etc.The site provides free access to data up to district level for census 2001 and 2011. Data is searchable and downloadable based on the areas and characteristics of population.

3.4.2 Export-Import Data Bank:

This databank is developed by Department of Commerceprovides time series data on Exports and Imports from India both commodity wise & country wise. The monthly data (http://commerce.gov.in/meidb) is available only from 2014 to 2016, whereas annual data (http://commerce.gov.in/eidb) is available from 1997-1998 to 2016-2017.

3.4.3 Govt. of India Data Portal: (https://data.gov.in)

Govt. of India open data portal hosts more than 50000+ datasets emanating from various government ministries and departments. The database is fully searchable and datasets can be searched by assigning suitable keywords. The data types available include market surveys, health surveys, NSS surveys etc.

1.1.4 ICSSR Data Service:(http://www.icssrdataservice.in)

The ICSSR Data Service includes social science and statistical datasets of various national-level surveys on debt & investment, domestic tourism, enterprise survey, employment and unemployment, housing condition, household consumer expenditure, health care, etc. As of now, the repository hosts 131 ASI (Annual Survey of Industries) and NSS (National Sample Survey) and other datasets.

3.4.5 National Family and Health Survey: (http://www.dhsprogram.com/Data/)

Family and Health Survey provides State and National information for different countries including India on fertility infant and child mortality, maternal and child health, reproductive health, nutrition, etc. Ready-to-use data for over 90 countries from over 300 surveys can be found here.

1.1.6 Reserve Bank of India:(http://dbie.rbi.org.in)

The Reserve Bank of India (RBI) is publishing data on various aspects of the Indian Economy and this database providesaccess to data mainly presented through time-series formatted reports. The types of data presented in this database include Banks & Banking statistics, Government Securities Market, Monetary Statistics, National Income, Prices & Wages, Equity and Corporate Debt Market, Central & State Govt. Finance (Combined).

International:

1.1.7 Asian Development Bank Statistical Database System:(https://sdbs.adb.org/sdbs/)

It stores macroeconomic indicators and social data of its developing member countries in Asia and the Pacific. SDBS has annual data on national accounts, prices, government finance, trade, balance of payments, money and banking, external debt, population, labor force, and social indicators. Other member countries' data on selected economic indicators as well as quarterly and monthly data of some indicators are also available. It provides data from 1990 to 2016.

1.1.8 FAO Stat:(http://www.fao.org/faostat/en/)

It provides free access to food and agriculture data for over 245 countries and territories starting from 1961 till recent years. The type of data covered includes agriculture production, trade, food supply, forestry etc.

1.1.9 International Monetary Fund Data:(http://data.imf.org)

IMF open data portal provides access to wide array of macroeconomic and financial time-series data. The data types include GDP, exchange rates, national accounts, investments, interest rates, etc. Some of its major datasets include Balance of Payments, Direction of Trade Statistics, Government Finance Statistics and International Financial Statistics.

1.1.10 The Organization for Economic Co-operation and Development (OECD):

(https://data.oecd.org)

It provides data on Agriculture, Development, Economy, Education, Energy and Environment, Finance, Health, etc. of its member countries. In addition to data, it also provides certain statistical tools to analyze and visualize data.

1.1.11 **United Nations Data Portal:** (http://data.un.org)

United Nations Data portal provides access to 35 databases containing 60 million records. The data sources of most of its constituent agencies and international organizations such as UNESCO, ILO, UNIDO, UNHCR, WHO, etc. have been included in this portal.

1.1.12 **World Bank Data:**(http://data.worldbank.org)

World Bank open data portal provides free and open access global development data. Some of it data sources covered include Global Development Finance, World Development Indicators, African Development Indicators, Education Statistics, Health Nutrition and Population Statistics, Millennium Development Indicators etc. The data can be browsed by country or indicator.

4. Conclusion:

Internet has proved to be an indispensable tool in the process of research. It provides wide variety of resources useful for scholarly research. In this paper, we have made an attempt to list out certain important free and open access resources available in the field of social sciences. Owing to the exhaustiveness of Internet, it ishumanly impossible to find and list out all suchinternet resources available in the area of social sciences. A continued effortis required to bring together all the possible e-resources to the notice of the social science researchers or scientists. It is a small miniscule in this direction.

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ROLE OF ACADEMIC LIBRARIES IN INDIAN HIGHER EDUCATION SYSTEM: AN OVERVIEW"

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Abstract: India has significant advantages in the 21st century knowledge race. It has a large higher education sector – the third largest in the world in student numbers, after China and the United States. The purpose of education is well-rounded development. Students need a combination of arts, computer science, science, and humanities or literature courses to achieve this kind of development. A well-equipped and well-managed library is the foundation of modern educational structure. It is said that education without library services is like a body without soul, a vehicle without an engine, and building with bricks but no cement. The library is the chief instrument for accumulating and using our intellectual heritage. Formal education can be conducted effectively and efficiently only with well-equipped libraries. Today, libraries are connected to a vast ocean of Internet-based services. Academic libraries are the nerve centres of their institutions, and must support teaching, research, and other academic programmes. These are critical contributors to knowledge generation which serve a wide spectrum of knowledge seekers. Libraries do this by providing access to knowledge which is essential for the development of the society. The mission of an academic library is focused principally on users and is driven by their needs. This study highlights the role of Academic Libraries in Higher Education and recent developments in academic libraries.

Keywords: Higher Education, Academic Library, Role of academic libraries in higher education, Latest developments in academic library system.

1. INTRODUCTION:

Education is an ongoing and unending process, and it can be sustained only by cultivating reading habit among people belonging to all sections and strata of our society. According to Mahatma Gandhi "Books play the role of soap for mind." Education is a process of leading one out of ignorance, and which exposes the individual to the light of knowledge. Learning is a lifelong process. In the formal educational system, i.e., at the school level, colleges and university level, the books plays a significant role in communicating the knowledge. Education plays a crucial

role in economic and social development and step towards modernization.

- The objective of education is to make a person an intelligent fellow. Education leads human intelligence towards truth. Emotions to humanity and human body to work-hand teachers have to play a decisive role in this respect.
- A person can gain knowledge mainly by three methods viz-

1) Through formal education which he/she gets in his/her school and college life.
2) Through his/her experience.
3) Through reading.

A library is the central responsibility for functioning of a university and a college. Academic libraries have a pivotal role in providing equal access to information. This aspect has been emphasised in Radhakrishnan Commission Report as well as in Kothari Commission Report. UGC (India) attaches great importance to the strengthening of library facilities in universities and colleges, and to their efficient administration. If the purpose of education is learning, then the library is an indispensable source of learning and there is no replacement of it. The objectives of an Indian university during pre-Independence period had been to archive knowledge. In post - Independence India, the libraries have aimed at dissemination of information for lifelong learning and incessant search for new knowledge. Well-established libraries with all round and up-to-date collections suitable for learning and research are necessary for higher education system, as they have proved to be significant partners in the development of scholarship throughout the world.

2. HIGHER EDUCATION SYSTEM:

types of Universities impart higher education to the students and award them academic degrees. They impart higher education to the students at the undergraduate and post-graduate level. They also provide vocational education and training them. Tertiary education is also provided by colleges and universities. The activities of universities regarding higher education are mainly concerned with teaching, research and social extension programmes. It is now observed that a large number of populations are taking higher education in many of the developed countries. So higher education has been given quite significant place in deciding the economic policies of the country. The process of higher education and related training are generally exercised by the universities. It is mainly theoretical education. On the contrary vocational education is mainly based on both theory and practice. The university which is imparting higher education and is conducting research programmes awards the students several kinds of degrees at the

graduate and post-graduate level and doctorate degree in all the branches of education.

Higher education also includes professional education besides traditional education, which gives post graduate education. Besides many purposes of higher education, one of them is to acquire concrete skills essential for the existence of the man in the world. It enables a person to think logically about the critical issues and put the facts in detail. It also makes the person to understand the implications of the activities in terms of morality and transfers his knowledge to others.

Indian higher education system is as large as the systems of the world. Before independence of India, the educational institutions were very few but at present there are number of universities including central universities, state universities, deemed universities and research institutions. There are thousands of colleges imparting education in all branches of knowledge. Similarly there are many lacks of teachers and millions students taking higher education. As per the Act of parliament, it established the University Grants Commission in 1956. Being an autonomous organization, its main purpose is to promote and coordinate higher education. The UGC has taken much initiative in developing university and college libraries. Taking into account the significant role of library in education, the UGC has acted upon the recommendations of many committees. Apart from academic function of the UGC, it provides financial assistance to universities and colleges for purchase of books and journals, for the development of infrastructure, purchase of equipment's etc. The UGC provides funds to universities and colleges for expansion of academic matters.[5]

After Independence, the development of higher education was very fast. There were very few colleges before independence. After Independence, there is remarkable increase in the education institutions in various disciplines of science, technology, computer, medical and agriculture. Higher education is always being criticized in terms of economy. Because higher education fulfils the demands of the regional and local employer for getting skilled employees. After all higher salaries are paid to graduates during their lifetime which helps to increase the quality of their life.

Growth of Higher Education Institutions in India.

Sl. No.	Year	No. of Universities	No. of Colleges
1	1951	28	578
2	1961	45	1,816
3	1971	93	3,227

4	1981	123	4,738
5	1991	177	7,346
6	2001	266	11,146
7	2011	523	33,023
8	2012	574	35,539
9	2013	666	39,671
10	2014	711	40,760

Source: Website of UGC and Annual Report 2014-15 of UGC.

The growth rate of educational institutions in India was very slow before independence in 1947. Since independence there has been substantial growth in the number of academic institutions – both universities and colleges in the last 60 years.

The above table shows that in the year 1951 the country had just 28 University level institutions this figure has gone up to 711 in 2014. The growth of degree colleges during the period has been even larger, more than 47 times. The number of colleges has gone up from 578 to 40,760.

3. ACADEMIC LIBRARY SYSTEM:

Libraries in the educational institutions are concerned with the teaching and learning process experienced by specific communities.

A library which is an integral part of a college, university, or other post-secondary educational institution (higher education), administered to meet the needs of its students, faculty, and staff for scholarly information and research services is the academic library. Large college or university libraries often have separate libraries within individual academic departments or schools which have a collection devoted to their subject or discipline such as chemistry, mathematics etc.

The general objectives of the academic libraries are:-

i) To serve the curricular, cultural and general education requirement of the academic community;

ii) To provide reference material at appropriate levels;

iii) To provide study areas of users;

iv) To provide a lending service appropriate to different types of users;

v) To provide an active information service.

These libraries are located on the campuses of colleges and universities and serve primarily the students and faculty of that institution and other academic institutions. Some academic libraries are also accessible to the general public in whole or in part, although borrowing privileges are often limited for users affiliated with the college or university only.

4. ROLE OF ACADEMIC LIBRARIES IN HIGHER EDUCATION:

Regarding higher education, the college libraries are not only trying to increase digital resources for the students but also trying to provide the knowledge to the common people which are significant feature of the age of information.

Information of higher education have their inception developed on libraries, and as such libraries are established as an integral part of higher level for successful implementation of their academic and research pursuit. This role of the library in supporting higher education has assumed greater importance and new dimensions now due to variety of factors especially knowledge explosion which is ten times more than the population explosion.

The primary aim of higher education is to impart specialized and advanced knowledge to students and expertise in various fields of human activity meant for all-round social progress and enrichment of human life. The substitute to knowledge explosion is the establishment of a sound and well equipped library with primary, secondary and tertiary sources with latest electronic devices. Library As a place of recreation, information and inspiration, be given top attention because library is a social institution to enlighten the citizenship and highlight the new generation of our past, present and future.

Dr.Radhakrishan Commission Report (1948-49) describes library in higher educations:

"The library is the Heart of all university works; directly so as regards its research works and indirectly as regards its educational work scientific research how it is being maintained and utilized."

1.4.2 National Policy on Education (1986):

The Government of India admitted failures in implementations and owned the responsibilities for not providing financial and organizational support to the required extent. To overcome the shortcomings and to make education more effective, Knowledgeable and to keep pace with the new developments in science and technology, the new policy on education was introduced in 1986.

Based on the Kothari Commission Report, a national policy on education was formulated by the Government in 1986. It laid stress on imparting education through regional languages; this policy was to be reviewed after every five years. On 5th January 1985, the Prime Minister of India promised to formulate a new education policy in order to prepare the country for the 21stcentury. And finally a document Challenge of Education: a policy perspective was placed before the Indian Parliament on 20th August 1985. The document made a survey of existing educational scenario and suggested the task ahead. It was severely criticized for not emphasizing the role of libraries. However, a revised document on New Educational Policy was prepared and submitted to the Parliament in 1986.

1.4.3 Functions of New Education policy in the higher education through library:

Higher education is a part of the nation's agenda for its development and change, and the library should play a pivotal role though the following supportive functions.

1. **Perspective plan:** Planning is an essential of life. It establishes framework of deciding not only what to do? But when? How to do it. Planning produces rationality and order in an organization. Therefore, it should not be a one shot affair, but it should be a continuous process to meet the challenges in techno-educational fields.

2. **Implementation of the plan:** Although planning takes time and is a continuous process, but there is no substitute if success is to be achieved. To implement the plans a good liaison between library and its users will certainly improve the present situation, they only it will meet its objectives.

3. **Easy Accessibility:** The various services should be easily available to the users and should be provided at the earliest possible time. Direct use of library should be identified for the common good.

4. **Freedom of Library:** The clients should have all reasonable freedom to access the various services and resources. They should be allowed to have free dialogue with the

co-operation. This co-operation attitude will strengthen the library as a social institution.

5. Collection Development: Collection development is a gradual work. It should be a shared activity between the library and users. Collection development should give great sense of library needs and use. The collection should serve not only curricular and research needs, abut also should be a universal character.

6. **User Orientation:** In the absence of orientation and training, the students of higher education feel handicapped in using the resources. Their poor communication skill and lack of confidence, etc. can be remedied through in house training in every institute of higher education.

7. Accountability and Assessment: Accountability of services, resources and users should be honestly studied. The services can maintain their genuineness only through regular and objective assessment. The various components of the library are the resources, staff and building must be subjected to the evaluation of library

5. RECENT TRENDS IN ACADEMIC LIBRARIES:

Libraries are established for the systematic collection, organization, preservation and dissemination of knowledge and information. It is very important for man to preserve and maintain the valuable knowledge and information contained in the books and documents because we want to preserve our knowledge and wisdom for the coming generations. By preserving the documents in a library this knowledge can be made available to others so that they can benefit from it. Establishment of libraries is not a new concept. The oldest library dates to around 2700 years ago in Sennacherib's Palace in Nineveh which shows how long ago the concept of leaving a piece of your wisdom behind started being formed into the organized collection to preserve the work.

With the invention of printing press, it became easier to preserve the knowledge in the form of printed documents. This led to the generation of a large number of books. The need for the preservation and dissemination of information led to the establishment of more and more libraries. Thus libraries acquired a great importance in the civilized society for education and research. Libraries play a vital role in the development of any society by enhancing the cause of education and academic research. They cater to the information needs of thousands of peoples.

The development of Science and Technology (S & T) in the last two centuries has led to an information explosion. Rapid changes have taken place at a great pace. In order to meet the growing needs of users the library system has been greatly improved and upgraded to meet the new challenges. The services offered by libraries have also undergone a great change. With the advent of new technologies in the field of computers and telecommunications, revolutionary changes have taken place in the field of Library and Information Science. The shape of traditional libraries containing a large number of printed documents is in the process of being transformed to paper less libraries containing a large number of digitized documents. The facilities offered by networking have not left libraries untouched. Modern libraries are not only digitized but networked also. This has led to the creation of virtual libraries i.e. libraries without walls through which the user has access to information at anytime, anywhere in the world by using the modern tools of communications, such as computers and Internet facilities.

6. CONCLUSION:

The development of higher education and libraries in India as compared to the pre-Independence period is much faster and qualitative in the post-Independence era. The major factors responsible for such a development were the University Education Commission of 1948-49, the Kothari Commission of 1964-66, and the birth of University Grants Commission in 1956. The UGC took special interest in academic libraries and with the help of its Library Committee and its recommendations related to space, staff, equipment's, collection development, services etc., followed by its curriculum development committees, establishment of INFLIBNET for the networking of academic libraries and the institutions of higher education and learning and the establishment of UGC-INFONET Digital Library Consortium.

The central mission of a library is to collect, organize, preserve, and provide access to knowledge and information. In fulfilling this mission, libraries preserve a valuable record of culture that can be passed down to succeeding generations. Libraries are an essential link in this communication between the past, present, and future. Whether the cultural record is contained in books or in electronic formats, libraries ensure that the record is preserved and made available for later use. Libraries provide people with access to the information they need to work, play, learn, and govern. People in many professions use library resources to assist them in their work and to gain information about personal interests or to obtain recreational materials such as films and novels. Students use libraries to supplement and enhance their classroom experiences, to learn skills in locating

sources of information, and to develop good reading and study habits. Public officials use libraries to research legislation and public policy issues. One of the most valued of all cultural institutions, the library provides information and services that are essential to learning and progress.

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SEARCHING HABITS OF INFORMATION IN DIGITAL ENVIRONMENT: A STUDY OF DEGREE COLLEGE FACULTY MEMBERS IN NORTH KARNATAKA.

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Abstract: The present study explores the searching habits of information in digital environment by the faculty member in north Karnataka. A survey method of research was used for the present study where in questionnaire was designed for the purpose of data collection. The study reveals that users are more aware and frequently uses web OPAC(79.8%) & users also uses Boolean operators like OR(76.%) NOT(8%) & AND(7%) are used heavily for searching various academic information. Faculty member awareness more about catalog tools.

Keywords: Information, searching, Digital, Environment, Web OPAC, Boolean operators,

1. Introduction:

Society has been transformed by the rapid development and diffusion of information and communication technology (ICT) in to fields such as education, business, health, agriculture, and so on. Information users may be bewildered by a variety of digitized information. The process of identifying and selecting information has become complex. It is critical to promote information literacy (IL) in the digital age. Computers have become a necessary part of this digital society, and skills for computer use are a common prerequisite on many job applications. The Department of Education, Training, and Employment (2001) Information literacy has become a global issue and many information literacy initiatives are being documented throughout the world. Information literacy of Forms the basis for lifelong learning it is common to all disciplines to all learning environments and to all level of education.[1]

Information literacy is a term used to describe a set of skills that enable individuals to seek, find, utilize and cite high quality information quickly and efficiently. Information seeking is a process in which humans engage in order to advance and potentially alter their state of knowledge. It is also an important cognitive function related to learning and problem solving, sometimes thought of

as a "higher cognitive process.[2]

Digital information Literacy is relatively new concept; it is one of the major components in information literacy. The digitally literate can confidently use, manage, create, quote and share sources of digital information in an effective way. The way in which information is used, created and distributed demonstrates an understanding and acknowledgement of the cultural, ethical, economic, legal and social aspects of information. The digitally literate demonstrate openness, the ability to problem solve, to critically reflect, technical capability and a willingness to collaborate and keep up to date prompted by the changing contexts in which they use information.[4]

Glister (1997, p. 290) defines digital literacy as, "a set of skills to access the Internet; find, manage and edit digital information; join in communications; and otherwise engage with an online information and communication network. In simple terms, digital literacy is the ability to properly use and evaluate digital resources, tools and services and apply it to their lifelong learning process." The New Media Consortium (2005, p.2) states that digital literacy, "includes the ability to understand the power of images and sounds, to recognize and use that power, to manipulate and transform digital media, to distribute them pervasively and to easily adopt them to new forms." The most essential aspect of digital literacy is the ability to make informed judgments about what is found online, for unlike conventional media, much digital information is unfiltered by editors and open to the contribution of all.[3]

2. Review of Literature:

The development of digital information literacy (DIL) has been slow in comparison to changes in information communication technologies, and this remains an issue for the higher education sec-tor (Duderstadt & Womack, 2004). There is evidence that exposure to technology alone does not adequately develop digital information skills, and more complex factors such as education and attitude must be considered (see, for example. Brown, Murphy, & Nanny, 2003; Eshet-Alkalai & Chajut, 2010). Having a digitally information literate population is important socially, economically, educationally, and globally (Ministry of Economic Development2008).

Digital technology is such a pervasive influence in all aspects of modern living that it has become the key to meaningful participation in work and social activities (Ministry of Economic Development, 2008). These technologies are not only important to the way we work and socialize, they also have implications for how we learn and think, to the extent that "mastery of such tools is a critical element

of what we know" (Saljo, 2010, p. 62). This becomes particularly significant when we take into account the widespread recognition of the importance of lifelong learning and the role digital technology might play in supporting such activity (American Library Association, 2006; OECD, 2004).

Digital technology is not new; a whole generation has grown up with this 'new' technology as an integral part of the way they live their lives (Prensky, 2001). The digital skills of the millennium generation and those from older age groups have mostly been developed outside the formal educational system; in the home or the workplace. The OECD report of 2006 found that students of most OECD countries had ready access to computers at school; however, it was at home that students mostly made use of their computers and developed their technical skills. As a result, students' "ICT-related competences grew exponentially, largely outperforming those of their teachers" (Pedro, 2007, p. 25). Consequently, the organic growth of digital literacy skills in the population has been ad hoc, uneven and largely determined by opportunities to learn (OECD, 2005). Given the large investment in educational technological infrastructure over the last 20 years, the failure to engage students in online learning and promote adequate development of DIL is discouraging (OECD, 2004).

The purpose of this study was to identify obstacles and support factors that influence the development of digital information literacy in staff and students in the tertiary education sector. Issues of access, including technical, organizational and personal, present the major obstacles to becoming more proficient in digital information literacy. Almost 80 years after they were first propounded by Dewey (1933), three educational principles seem to have particular resonance in a digital learning environment: learning through experience, engagement in activities of personal relevance, and learning collaboratively.

Association of College and Research Libraries (2000). It defines information literacy as a set of abilities requiring individuals to determine the extent of information needed, access the needed information effectively and efficiently; evaluate information and its sources critically, incorporate selected information into one's knowledge base; use information effectively to accomplish a specific purpose; understand economic, legal and social issues, surrounding the use of information ethically and legally; manage and maintain information; provide means of access to information; search for information; and gather, evaluate and use information.[4]

Digital Literacy Competencies:

Computers and productivity tools help library patrons to access information, generate insights, structure results into a useful formal, and produce knowledge. The use of these productivity tools by patrons requires librarians to alter their traditional professional role, which was primarily to provide information access for patrons, so that they can also provide expanded services and support to these patrons.

The traditional role of librarians was viewed as one of making information accessible to patrons using various tools and processes in the library. Yet the emergence of technology has significantly changed the role of librarians (Gateman, 2001).[5] There is a paradigm shift; librarians now are expected to assist patrons in integrating materials into their research processes at the time of information access. In discussing the current state of affairs in libraries, McFadden [2001][7] argues that there is a critical distinction to be made between librarians' competencies with productivity tools and their level of information retrieval skills. The American Library Association (ALA)[2001][8] stated that it is becoming an essential part of library services to help patrons develop the competencies that they need to function effectively and efficiently in the emerging digital culture of the 21st century (ALA, 2001).[6]

Digital Literacy Competencies and Librarians:

The global society does not recognize nor respect boundaries. Areas that were once the domain of the librarian have been encroached upon by other sectors, groups and professions. Library and information staff will need to have experience expertise and proficiency in traditional, electronic and transferable skills. The key skills required in the twenty-first century include strategic thinking, managing change, financial management customer satisfaction, communications, decision-making, as well as understanding the role of ICT and digital literacy competencies.

Changing Characteristics of Digital Information Literacy:

1. To select, acquire, preserve, organize and manage digital collections.
2. To Design the technical architecture of digital Literacy.
3. To describe the content and attributes of items.
4. To plan, implement, and support digital services such as information navigation, consultation and transmits services.

Digital Literacy in Changing Environment:

The digital Librarians should acquire latest techniques to meet the needs of the users. He should have the following qualities and capabilities. The knowledge of the digital librarians should not confine to a single field. He should cover varied subjects such as Library Science, Computer Science and some specific technologies, communication science etc. The digital librarian should have the following information literacy qualities to disseminate right information at the right time.

Digital Information Literacy for Lifelong Learning:

When investigating research question three, answers about the importance of digital information literacy for the lifelong learning of staff and students (including Maori and Pasifika), productivity and innovation were sought. The participants definitely left the project better equipped to deal with technological challenges, and more motivated to utilize a wider and more diverse range of tools and strategies for lifelong learning. The discussion is summarized under the following headings: productivity and innovation; changing the approach to learning; attitude shifts, the need for time and future proofing.7

3. Objective of the study:

The main objectives of the study are:

1. To study the characteristics composition of the study population under study
2. To find out users having knowledge of OPAC.
3. To know the frequency on the use of OPAC.
4. To find out which cataloguing tools users use to search.
5. To know what is the rate of success in using OPAC.

4. Need for the study:

The study is undertaken to investigating the level of OPAC and the searching habits of information in digital environment a study of faculty member in north Karnataka. The study population is basically involved in teaching, research and knowledge extension. The faculties of Degree College require Information for Teaching, Learning and Research. They need constantly update their existing knowledge in their domain. Today abundant of Information is available in digital form and filtering and utilization skill is required for faculty members. Hence, in the present investigation an attempt shall be made to undertaken to know search habit of information in digital among on the faculty in degree colleges.

5. Scope and Limitations of the Study:

The presents study is mainly based on the primary data collected from sample respondents and the following limitations have been identified. The present study is explorative in nature and be restricted geographically to the sample population of only faculty members of the north Karnataka degree college which offers general course. Further, colleges which offer technical and medical science are not included in the present study. Present study has confined to the searching habits of information in digital environment.

6. Methodology:

In order to find out Searching Habits of Information in Digital Environment, survey method has been employed for the collection of data required. A structured questionnaire was designed keeping in view the objectives of the study. The questionnaire has been distributed among 100 Faculty out of which 100 questionnaire were received from the respondents.

7. Analysis and interpretation of the data:

Table 1-Sex of the respondent

Sex		Frequency	Percent	Valid Percent	Cumulative Percent
1	Male	94	94.0	94.0	94.0
2	Female	6	6.0	6.0	100.0
	Total	100	100.0	100.0	

Table -1 shows the sex wise distribution of study sample, it is found that majority of the study population (94. %) belongs to male category. However, hardly 6. % of the respondents belongs to female category. It can be concluded that majority of the study sample come under male category only.

Table -2 Domicile

Domicile		**Frequency**	**Percent**
1	Rural	3	3.0
2	Urban	97	97.0
	Total	100	100.0

Table – 2 Most of the study population are from urban area and only very small representation from rural background under study.

Table -3 visit to Library

Sl. No	Opinion	Frequency	Percent
1	Yes	100	100
2	No	0	0
	Total	100	100.0

From the table -3 shows that all the respondents under study visit library.

Table -4 Frequency of visit to Library

Sl. No	Frequency of visit	Frequency	Percent
1	Daily	92	91.1
2	Weekly	5	5.0
3	Fortnightly	2	2.0
4	Monthly	1	1.0
	Total	100	100%

Table- -4 shows that frequency of visit to library, 91.1% of respondents visit library daily. 5% of the respondent visit weekly another 2% of the respondent visit Library Fortnightly only 1% of the user visit library monthly.

Table-5 Knowledge of Catalogue searching methods

Sl .no	Searching methods	Responses	Percent
1	By author wise	79	79.8%
2	By title wise	86	86.9%
3	By subject wise	48	48.5%

Table -5 Indicate the searching methods of cataloguing faculty asked about method of searching most of the users 86.9% getting their document searching by title wise. Other 79.8% are comfort with search by author wise and subject wise.

Table -6 Are you aware of the type of cataloguing tools

Sl .no	Type of cataloguing tools	Responses	Percent
1	Library catalogue	24	24.2%
2	Web OPAC	79	79.8%
3	OPAC	32	32.3%

Table1.6 Faculty member study under to know the awareness catalog tools the representation are given their respondent in the table – Majority of the respondent aware of web OPAC(79.8%), and OPAC(32.3%)followed by there who know Library Catalogue(24.2%).

Table 7-Web OPAC Search

Web OPAC Search	Frequency	Percentage
Basic search	67	67.67
Guided Search	37	36.63
Expert search	76	75.25
Any other	00	0.00

Table-7 It is reveals that patrons are using different searching options while search for the document in the library. Most of the Faulty (N=76, 75.25%) took help from Expert search. Rest of (N=67, 67.67%) using Basic search and another (N=37, 36.63%) satisfied by Guided search. Very less of Faculty was going to other searching options.

Table-8 Knowledge Boolean operators

Sl .no	Boolean operators	Responses	Percent
1	AND	7	7.0
2	OR	9	9.0
3	NOT	8	8.0
4	All	76	76.0

Table -8 Indicates that majority of the study population using all the three Boolean operators in higher percentage (N=76, 76%), Boolean operators are used in percentage wise OR (16%) , NOT(8%)and AND(7%).

Major Findings:

1. Majority of the study population (94. %) belongs to male category. However, hardly 6.% of the respondents belongs to female category. It can be concluded that majority of the study sample come under male category only.

2. Most of the study population is from urban area and only very small representation from rural background under study.

3. Shows that all the respondents under study visit library.

4. Shows that frequency of visit to library, 91.1% of respondents visit library daily.

5% of the respondent visits weekly another 2% of the respondent visit Library Fort-nightly only 1% of the user visit library monthly.

5. Indicate the searching methods of cataloguing faculty asked about method of searching most of the users 86.9 getting their document searching by title wise. Other 79.8 are comfort with search by author wise and subject wise.

6. Faculty member study under to know the awareness catalog tools the representation are given their respondent in the table – Majority of the respondent as well aware of web OPAC, and OPAC followed by there who know library cataloguing.

7 It is reveals that patrons are using different searching options while search for the document in the library. Most of the Faulty (N=76,75.25%) took help from Expert search. Rest of (N=67, 67.67%) using Basic search and another (N=37, 36.63%) satisfied by Guided search. Very less of Faculty were go to other searching options.

8. Indicates that majority of the study population using all the three Boolean operators in higher percentage (N=76, 76%), Boolean operators are used in percentage wise OR (16%) , NOT(8%)and AND(7%).

8. Conclusion:

OPAC as an important tool through which Faculty can gain quick & wider access to library holdings collection. This study reveals that searching habits of information in digital Environment Faculty members of North Karnataka have knowledge of search techniques in OPAC. All off using Boolean operators.

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Use of Search Techniques / Strategies by the Faculty Members of Engineering and Technology Colleges of north Karnataka

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Abstract: The main purpose of the present paper is to examine the users' perceptions on search engines in Engineering and Technology colleges affiliated to Visvesvaraya Technological University, Belagavi. The survey method was used and questionnaire tool to elicit the opinion from the faculty members of five disciplines such as Civil, Computer Science, Electrical & Electronics, Electronics & Communications and Mechanical Engineering. A total of 1150 questionnaires were distributed to the respondents, out of which, an overwhelming i.e., 1015 questionnaires were received back with a response rate of 88.26%. The outcomes of the study are: more than 90 % of the respondents are aware of search techniques and strategies, more than 80 % respondents find it easy to locate relevant information while using search techniques / strategies; and 839 (90.89 %) respondents agreed that the awareness of search techniques / strategies help them extract quality information using search engines.

Keywords: *Search engines, Search techniques, Search terms, Faculty members, Engineering and Technology College, North Karnataka*

1. Introduction

Over the past few decades, important technological developments have created a global environment and bringing people of the world closer and closer. The significant developments in the field of Information and Communication Technologies (ICT) have created revolutionary changes in all fields of knowledge. The Internet and World Wide Web (WWW or Web) are incredibly popular in almost all organisations. Due to the technological developments, a vast amount of information is available over internet. This resulted into information explosion.

The Internet has become the last resort for locating any kind of information. People are using Internet for commerce, education, entertainment and what not, for everything under the sun. Internet has a huge collection of information sources which embrace each and every field, as it includes more than 493 billion pages as given by the World Wide Web size.com during September 2016 (world wide web size.com, September 2016). Based on the Netcrafts survey during September 2016 data, it is estimated that 1,285,759,146 Web sites and 6,118,785 Web servers are available on Web (Netcrafts Survey September 2016). It is also worth to mention here that the number of Internet users are also increasing with the increasing of Web resources. Around 40% of the world population has an internet connection, according to a report announced by the Internet World Stat, the total number of Internet users as on September 2016 is 3,611,375,813 (Internet world stat, September 2016). Every day the number of such WebPages goes on increasing, it may not be possible for a person to surf the whole Internet within his lifetime (Edosomwan and Edosomwan, 2010).

2. Need for the study

Search engine is a tool which accesses information available on the Web. Without the search engines the information retrieval from the Web is very difficult. One may say that the user satisfaction depends upon the search strategies deployed by the user. But, at the same time, it also depends upon the quality of search engine used for information retrieval. For today's researchers, the use of internet resources is as useful as resources in a print form. In fact, the internet resources are more easily accessible as well as cost savvy as compared to the other form of resources. In order to carry out the research efficiently and effectively, the researcher should be aware of the differences between various search engines and their working. The present study helps the users to understand how their research might go in a better way if the researcher possesses knowledge as which search engine gives results in what way. The knowledge of search techniques / strategies is prerequisite for searching core results without much difficulty.

3. Objectives of the study

The main objective of the study is to examine the user perceptions on search engines in some of the selected engineering colleges in north Karnataka.

The specific objectives of the study are to:

1. know the awareness of search techniques / strategies for improving the search;
2. emphasize the reasons why the faculty members use search techniques / strategies;

3. elicite the opinion on search techniques / strategies by the faculty members; and
4. know whether there is a need for conducting Training / Orientation programmes on how to use search engines effectively.

4. Methodology

The present study deals with the user perceptions on search engines with special reference to selected Engineering Colleges of North Karnataka, India. The survey method was used and questionnaire tool to elicit the opinion from the faculty members of five disciplines such as Civil, Computer Science, Electrical & Electronics, Electronics & Communications and Mechanical. A total of 1150 questionnaires were distributed to the respondents, out of which, an overwhelming i.e., 1015 questionnaires were received back with a response rate of 88.26%. The data collected then were fed into computer for frequency distribution and advanced statistical tests to validate the data and to draw the inferences.

5. Scope and Limitations of the Study

The population of this study was limited to the faculty members of Engineering and Technology colleges only and excluding several other technical courses like Architecture, Management and Pharmacy etc. The present study also suffers from geographical restriction, i.e. the Engineering colleges in North Karnataka which have been established before 2000 are considered for the study. North Karnataka means Belagavi (erstwhile Belgaum) region and Kalaburagi (Kalburgi) region Engineering and Technology colleges affiliated to Visvesvaraya Technological University (VTU). There are 46 engineering colleges established in North Karnataka, out of which 23 Engineering colleges have been established before 2000 and taken for the study.

6. Analysis and Interpretation of Data

Awareness of search techniques / strategies

The use of search techniques / strategies is prerequisite to search relevant information using search engines. A question was asked to the respondents on the awareness of search techniques / strategies. The majority, i.e., 923 (90.94%) respondents are aware of search techniques / strategies, whereas, 92 (9.06%) respondents are not aware of the search techniques / strategies.

Table 1: Awareness of search techniques / strategies

Awareness	No. of respondents	Percentage (%)
Yes	923	90.94
No	92	9.06
Total	**1015**	**100.00**

Use of different types of search techniques / strategies

A multiple choice question was asked to the respondents on the use of different types of search techniques / strategies. The majority, i.e., 597 (64.68%) respondents are aware of field search (author, title, subject terms etc.), whereas, 582 (63.05%) respondents are aware of keywords (specific keywords) search, 544 (58.93%) respondents are aware of Boolean search (AND, OR, NOT), Phrase search ("....."), Plus or Minus operators (+, -) and other techniques / strategies were given less preference.

Table 2: Use of different types of search techniques / strategies

Search Technique / Strategy	No. of respondents (n=923)	Percentage (%)
Field search (author, title, subject terms etc.)	597	64.08
Keywords (specific keywords)	582	63.05
Boolean search (AND, OR, NOT)	544	58.93
Phrase search ("....")	301	32.61
Plus or Minus Operators (+, -)	230	24.92
Synonymous	68	7.37
Proximity search (tilde ~ symbol)	46	4.98
Truncations (*,!,?,$ etc.)	15	1.63

Purpose of using search techniques / strategies

The table 3 reveals that the purposes of using search techniques / strategies. Among the 923 respondents, 741 (80.28%) respondents find it easy to locate relevant information, followed by, 630 (68.25%) respondents used the techniques / strategies to get less results but right hits (core results). 626 (67.82%) respondents used strategies to restrict the search results avoiding unnecessary usage of search terms. Other purposes like save the time of search, get more accurate and appropriate results are some of the other reasons that the faculty members used search techniques / strategies.

Table 3: Purpose of using search techniques / strategies

Purpose	No. of respondents (n=923)	Percentage (%)
Easy to find / locate relevant information	741	80.28
Get less results but right hits	630	68.25
Restrict the search results	626	67.82
Save the time of search	583	63.16
Get more accurate & appropriate results	516	55.90

Opinion on extracting quality information through search techniques / strategies

The table 4 indicates the opinion on extracting quality information using search techniques / strategies. The majority, i.e. 839 (90.89%) respondents agreed that the awareness of search techniques / strategies help them extract quality information using search engines, followed by, 63 (6.83%) respondents strongly agreed and only 4 (0.40%) respondents disagreed with the statement.

Table 4: Opinion on extracting quality information through search techniques / strategies

Opinion	No. of respondents	Percentage (%)
Strongly Agree	75	8.12
Agree	818	88.63
Uncertain	28	3.03
Disagree	02	0.22
Strongly Disagree	00	0.00
Total	**923**	**100.00**

Opinion on search techniques / strategies and improved search capabilities

A question was asked to the respondents to elicit opinion on whether the search techniques / strategies will help them improve the search capabilities. The majority, i.e., 832 (90.14%) respondents agreed that search techniques / strategies have helped them improve their search capabilities on Internet, whereas, 60 (6.50%) respondents strongly agreed with the statement. Only 4 (0.43%) respondents disagreed with the statement.

Table 5: Opinion on search techniques / strategies and improved search capabilities

Opinion	No. of respondents	Percentage (%)
Strongly Agree	60	06.50
Agree	832	90.14
Uncertain	27	02.93
Disagree	04	00.43
Strongly Disagree	00	00
Total	**923**	**100.0%**

Areas of Training / Orientation programmes

A question was raised to the faculty members on the need for conducting the training / orientation programmes. The majority, i.e. 845 (91.55%) respondents felt the need to conduct the training / orientation programmes. There are number of areas one can conduct these training programmes. The majority, i.e., 776 (80.08 %) respondents want training programmes on field search, followed by 774 (79.88%) respondents require training on truncations search, 761 (78.53%) respondents need training programme on proximity search. Good number of respondents felt that there is a need to conduct training programmes on the other areas like Boolean operators, advanced search and phrase search.

Table 6: Areas of Orientation / Training programmes

Areas	No. of respondents	Percentage (%)
Field search	776	80.08
Truncations search	774	79.88
Proximity search	761	78.53
Boolean operators	666	68.73
Advanced search	632	65.22
Phrase search	584	60.26

7. Conclusion

In the early emergence of the Web, search engines could meet users' information needs to a certain extent, but as resources developed in the dynamic environment, search engines have been overloaded by thousands of documents resulting in information overload or chaos (Moghaddam and Parirokh, 2006). The Internet has

revolutionized the information today. The search engines have made searching the Internet very easy. They have emerged as a solution to the problem of accessing information sources on the Net.

The search results are influenced by search capacity, design, speed, indexing, database and frequency of updating of a search engine. The power of search engines lies in the diversity of the information they index. New features are being invented and added to the search engines to make the task of finding the appropriate information as simpler as possible. The present study helps the respondents to understand the importance of search techniques / strategies while searching accurate and results within the heap of information available over Internet.

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A STUDY OF ICT INFRASTRUCTUREFACILITIES IN THE FAHION AND APPAREL INSTITUTE RESOURCE CENTRESIN INDIA

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Abstract:*The study investigated the present Information Communication Technology infrastructure facilites in practiced by the Fashion, Apparel and allied subject institute resource centres/libraries in India. The study highlighted the ICT faccilties, ICT skilled library staff and network connectivity of Fashion and Apparel institues resource centres to provide information resources and services to the users in the vast country like India.*

Keywords: *ICT, Fashion, Apparel, Desisgn, Textiles, Resource Centres.*

1. INTRODUCTION:

Today libraries are shifting their role from the custodian of traditional information resources to the provider of service-oriented digital information resources. Widespread use of computers, increased reliance on computer networks, rapid growth of the Internet and explosion in the quality and quantity of information compelled libraries to adopt new means and methods for the storage, retrieval and dissemination of information.

The modernization of libraries and information centers enabled information transfer and access, thereby establishes a network of libraries and information centres. This initiative helped in resource development, resource sharing and their utilization at various levels. Information professionals subscribe to e-journals, CD-ROM databases, online databases, web-based resources, and a variety of other electronic resources. They participate in library consortia and build digital libraries. However, these libraries have been hampered by many constraints to

embark on successful application of information and communication technology (ICT) for their operations, resources, and services *(Williams & Channaveeraiah, 2008).*

In this age of globalization, the importance of ICT to people generally and information professionals in particular cannot be overemphasized. This is true because ICTs facilitate quick and easy access to a wide range of information/ information resources world wide. In fact, it is now difficult to imagine a world without information technology. The provision and use of ICT is part and parcel of the entire system, to both the students, information professionals and the institutions. It is one thing to recognize the importance of ICTs and another to know if they are effectively used by professionals, students and academics. If ICTs are put to effective use, the essence of acquiring them is to a large extent justified vice-versa.

Lowe and McAuley (2002) defined information and communication technology literacy as "the skills and abilities that will enable the use of computers and related information technologies to meet personal, educational and labour market goals". *Ebijuwa (2005)* defined ICT as tools used for collection, processing, storage, transmission, and dissemination of information. With advances in ICT, electronic information resources such as electronic books, electronic journals, CD-ROM databases, OPAC, Online databases and the Internet have launched the world into an information age. No institution or organization can still rely on only traditional printed information resource to perform effectively and efficiently. To librarians, ICT is a significant development that provides tools for managing the avalanche of information generated by modern society*(Quadri, 2012).*

The increasing participation of clothing and fashion and apparel industry in information seeking is encouraging. The establishment of Textile Research Associations (TRA"s), National Institute of Fashion Technology (NIFT), National Institute of Design (NID) and Apparel Export Promotion Council (AEPC) etc., Technological Upgradation Scheme (TUS) for clothing industry by the Government of India to modernize the industry is a right choice to prepare to face the competition successfully in post quota era in fashion business world.

The libraries/resource centers of the Textile Research Associations, National Institute of Fashion Technology, Apparel Export Promotion Council, National Institute of Design are the repositories of fashion and apparel information and the resource accessible to the professional players to imbibe the fashion trend information for their day to day activities. Resource centers of all TRA, NIFT, NID, and AEPC are the success story of fashion and apparel education in India, which always strives to give the best to the professionals and to the fashion and apparel

business of the country.

2. REVIEW OF LITERATURE:

Literature review is an important process where a researcher reviews the literature notonly to compare the results with the previous results but also to present them in new andperhaps with unique dimensions. The review of literature revealed that a number ofstudies have been reported. *Rathod and Padmmamma (2015)* the study investigated the present information resources and services practiced byFashion, Apparel and allied subject institute resource centres/libraries in India. Thestudy highlighted the lacuna in information resources and services to the users in thevast country like India.*Kannappanavar and Prakash (2011)* evaluate the present situation of fashion technologyinstitute libraries in Bangalore city. The study is intended to elicit opinion from thestudents of fashion technology institutes in Bangalore city regarding the resources andservices of their respective libraries. *Dutta, (2010)* deals with the impact of the changingnature of information needs of fashion educators and their usage of fashion periodicals atthe National Institute of Fashion Technology (NIFT) Delhi. *Gopalakrishnan; RameshBabu and Gopalakrishna (2008)* discussed that the information use pattern by theacademicians of fashion technology has been taken into consideration. In India, educationin fashion technology has been given due importance at the national level. *Bandi (2004)* discussed the role of the seven centers of National Institute of Fashion technology (NIFT)in India. This work unfolds the problem of the different user community concerned tofashion designers in fashion design technology.

3. OBJECTIVES OF THE STUDY:

- To identify the Information Communication Technology (ICT) facilities in fashion, apparel and allied subject institute libraries; and
- To know the available network connectivity in fashion, apparel and allied subject institute libraries in India.

4. SCOPE AND METHODOLOGY:

Geographically it is extended to India. The scope of the present study is limited. Themethod of purposive sampling used to information resources and services in fashion andapparel leading institute libraries in India. In order to achieve the objectives of this study,the research adopted a survey method with a design instrument (questionnaire) withwhich data was collected from library staff of the

following institute libraries. It isconfined to the leading Fashion, Apparel, Design and Textile training and researchcenters in India. viz.;

- Textile Research Association's, (TRA's)
- National Institute of Fashion Technology (NIFT),
- National Institute of Design (NID),
- Apparel Export Promotion Council (AEPC),
- Sardar Vallabhbhai Patel International School of Textiles & Management (SVPITM).

5. DATA ANALYSIS:

The collected data were tabulated and analysed systematically using the SPSS software. The data from the survey of 28 selected Fashion and Apparel Institutions and Organisations in India is presented broadly mainly the ICT Infrastructure and Network availability.

The data are presented in Graphical form for clarity and visibility. The results of the study analysed and assessed the existing ICT status of Fashion and Apparel Institutions and Organisations.

6. ICT INFRASTRUCTURE:

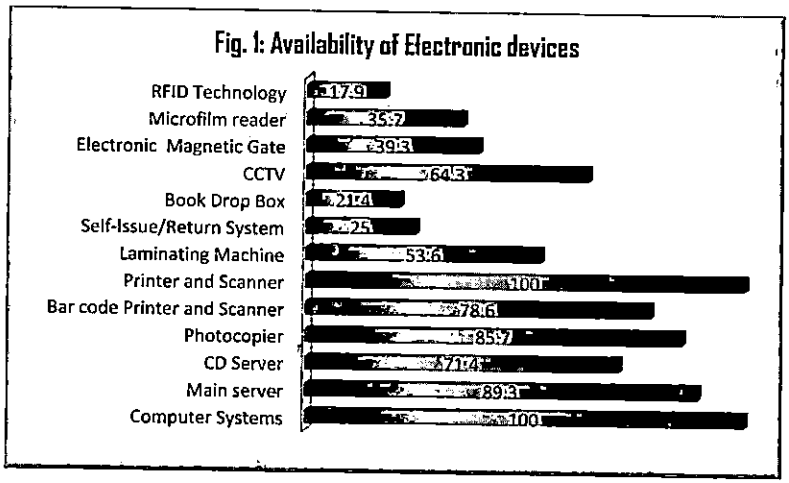
ICT infrastructure is usually considered with respect to its main areas, which are hardware, software, telecommunication and humanware. The lack of infrastructure facility remains the main bottleneck to the development of ICT use in the libraries. Sufficient infrastructure is very essential for the successful implementation of advanced and emerging library and information services and resources.

Computer and Communication Facilities

The use of various ICT infrastructure facilities should be supported by the suitable electronic gadgets or devices, simply the computer systems or work stations and servers.

Electronic devices available in fashion and apparel libraries/resource centres is presented and discussed in Figure - 1. It is found that the entire 28 (100%) libraries/resource centres are having computer systems, scanners and printers. About 25 (89.3%) libraries/resource centres are having main server and 24 (85.7%) libraries are having photocopier. The results indicate that 78.6% (N=22) of the libraries/resource centres are having barcode printer and scanners. In addition to that 20 libraries are having CD server (71.4%), 64.3%, (N=18) of

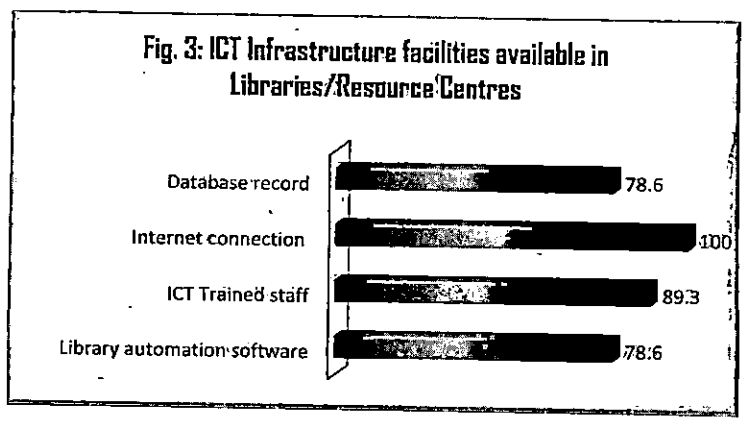
libraries having CCTV, Laminating machine 53.6%, (N=15), Electronic magnetic gate 39.3%, (N=11), Microfilm reader 35.7%, (N=10), Self issue/return system 25% (N=7), Book drop box 21.4%(N=6) and RFID technology 17.9%(N=5).



It is found that majority of the libraries/resource centres under study have basic hardware facilities like Computers, Servers, Printers, etc. The libraries of NIFTs and NID have better hardware facilities including Server, Barcode Printer, RFID technology, CCTV, etc. It is very essential to have sufficient hardware for providing ICT based services and resources. The cost of hardware is gradually decreasing and the ICT application in libraries/resource centreswould be cost effective.

ICT Infrastructure facilities available in Libraries/Resource Centres

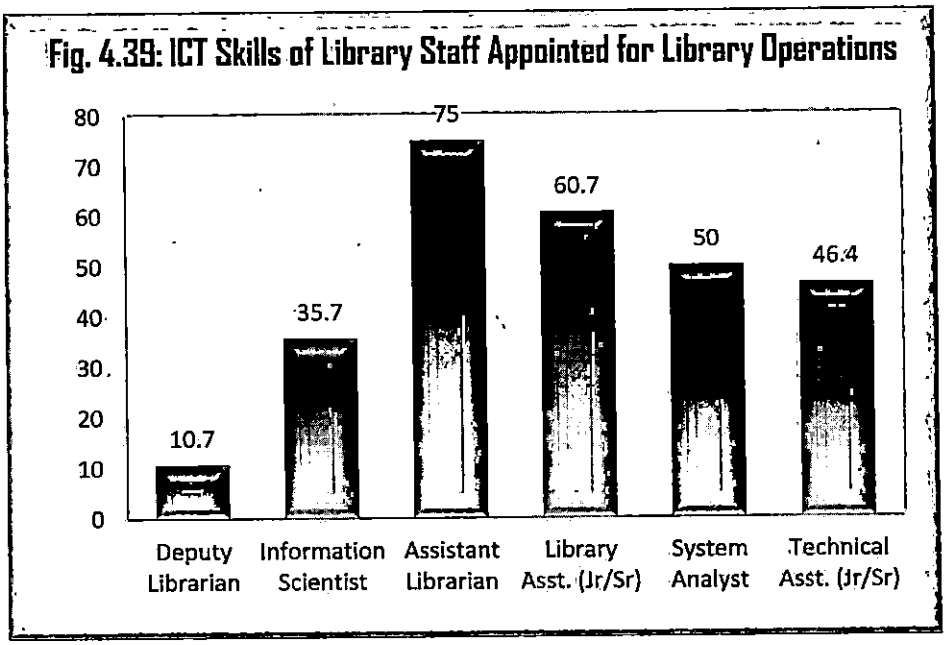
The Figure – 2,shows that the ICT infrastructure facilities available in libraries/ resource centresof fashion and apparel institution.



Nearly 89.3%(N=25) of the libraries/resource centresare having ICT trained staff, 78.6%(N=22) of the libraries/resource centres are having library automation software and database record, hundred percent (100%, N=28) of library having Internet connection.

ICT Skills of Library Staff

The Figure – 4, presents ICT Skills of library staff appointed for library operations in the fashion and apparel institutes under study.



It is found that among 28 libraries/resource centres i.e., 75% (N=21) of the libraries/resource centres have Assistant Librarians with computer background, 60.7%(N=17) of the libraries/resource centres has Library Asst. (Jr/Sr) with computer background. Only 50%(N=14) have System Analyst, Technical Asst. (Jr/Sr) (46.4%, N=13), Information Scientist (35.7%, N=10) and lesser numbersare Deputy Librarians (10.7%,N=3) withgood knowledge of computerized library operations.

It is found that in the response received from the interviews with the librarians that library professionals of majority of libraries/resource centres under study have adequate skill and expertise in ICT based library resources and services. But it is also found that in majority of libraries the ICT based library resources and services are managed by a single library professional. Most of them need more qualified library professionals to handle ICT based resources and services. In most cases the library

professionals are not trained in ICT based resource and services but are getting support from the computer professionals of the institute or libraries depends on them for rectifying any problem in the hardware, software or networking.

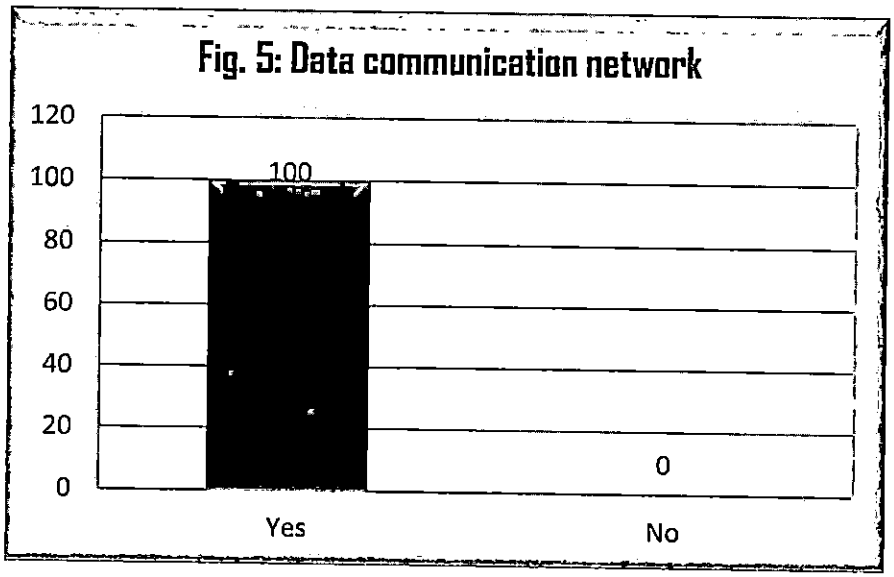
The library professionals need to improve their skill and expertise in ICTby attending workshops, seminars, short-term course or undergoing refresher courses or any other means like deputing professionals to other institutions, etc. Libraries should be provided career advancement facilities to acquire and improve the knowledge, skill and expertise in ICT.

NETWORK CONNECTIVITY:

The transmission of data especially digital data from one location to a remote location is very essential. Libraries of all over the world have adopted the telecommunication and networking technology for to and from, transmitting digitized data of all kinds.

Data Communication Network

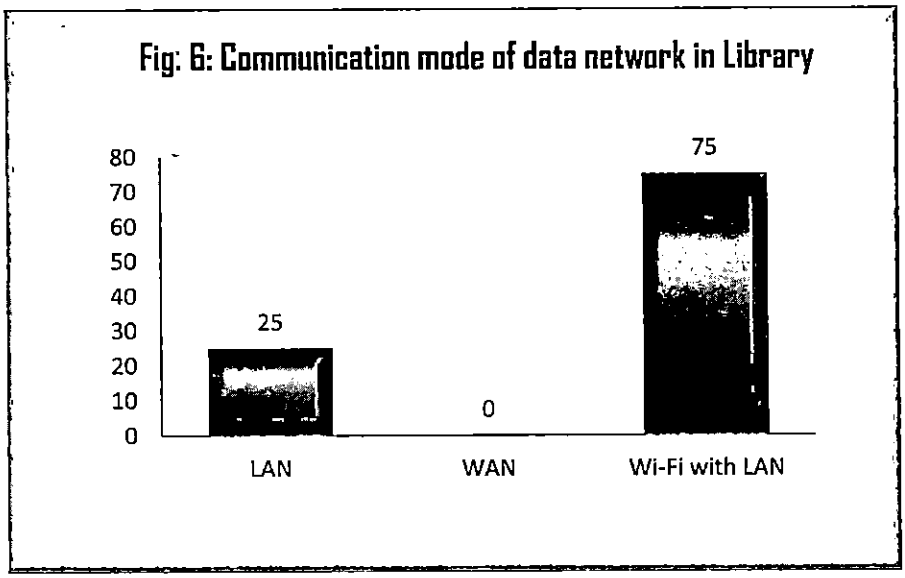
The Figure – 5,reveals the data communication network in fashion and apparel institutes under study.



All thelibraries/resource centresare having the campus wide data communication network for the users 100%, (N=28)

Communication mode of Data Network (Type of Network available)

The Figure – 6,reveals that type of Network available in fashion and apparel institutes libraries/resource centresunder the study.

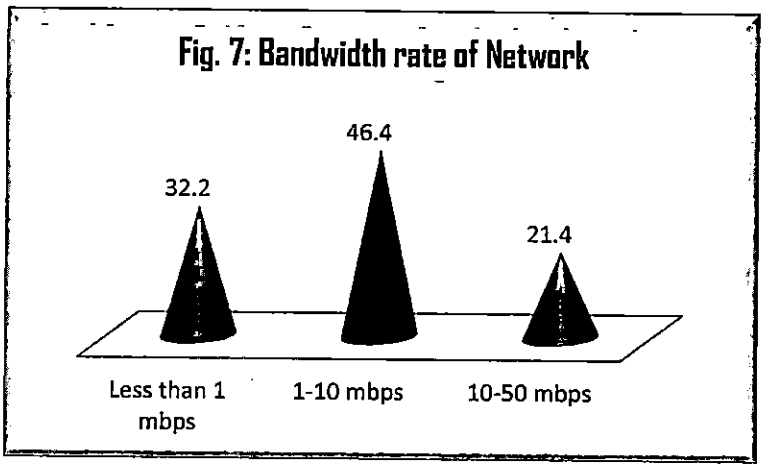


The figure – 6,depicts the mode of communication network type which are available in libraries/resource centres. Amongst all Wi-Fi with LAN dominate with 75% (N=21), followed by LAN with 25% (N=7).

However, it is observed that majority of the libraries about 75% libraries have separate network and machines or computer terminals that are connected to the institute's LAN with Wi-fi. In some of the cases 25 percent only LAN with one terminal in the library is connected to the institute LAN for accessing the network for services like internet. This is too suitable for providing advanced ICT based services like cloud computing and access to online databases and institution repositories', e-resources and electronic journals. It is also found that nullity in WAN connection may be because of the premises of institution is situated in isolated or in small size compare to other research centres.

Backbone Strength of Network

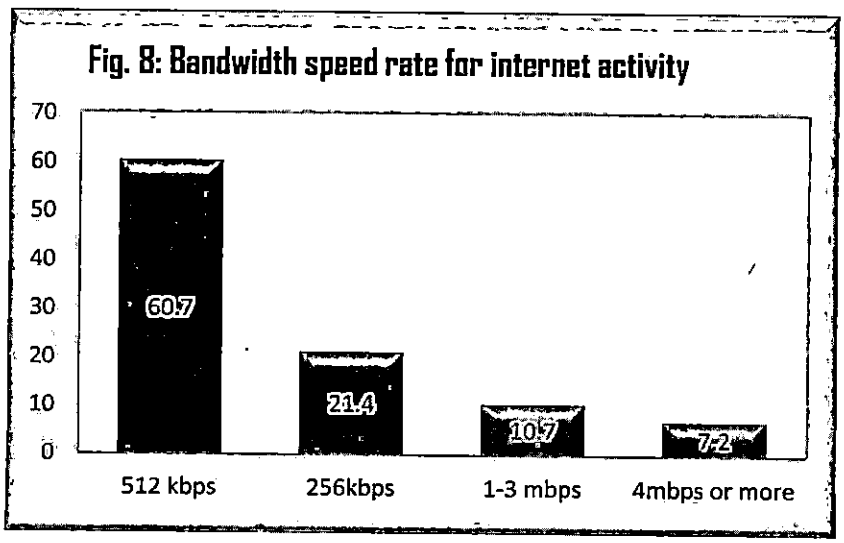
Badwidth of network is a backbone strength of the communication network. The Figure – 7, provides the details of the Bandwidth available to the institutes under study.



Above figure reveals that 9 of the 28 libraries/resource centres that is 32.2% (N=9) libraries/resource centreshas less than 1 mbps internet speed, 46.4% (N=13) libraries/resource centres use 1-10 mbps and remaining 21.4% (N=6) libraries/resource centres use10-50 mbps internet speed.

Data Communication Speed of Network

The Figure – 8, provides the details of data communication speed rate of network in the institutes under study.

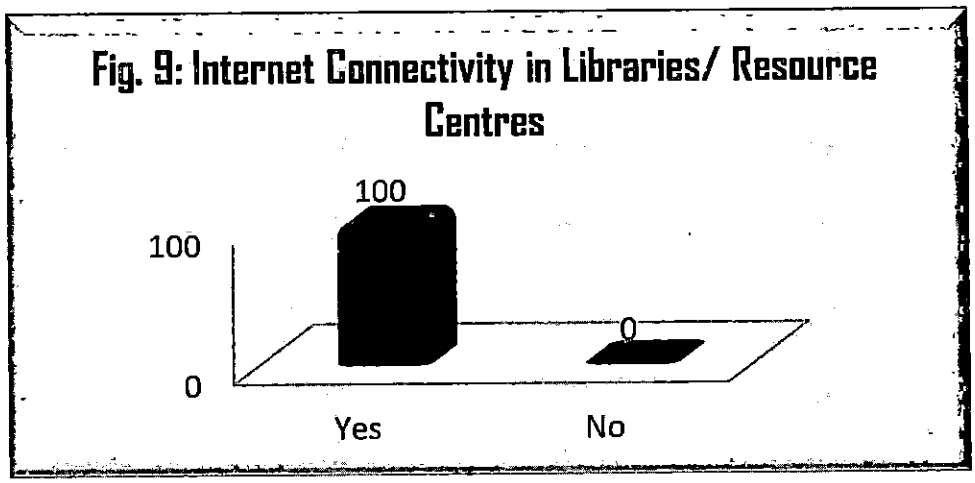


Above figure reports that speed rate for internet activities. The majority of the libraries/resource centres use 512kbps which is the highest internet speed rate in this study with 60.7% (N=17), followed by a good numbers of libraries/resource centres indicate decrease in use of internet speed with 256kbps 21.4%, (N=6), very less number of libraries/resource centres use only 1-3mbps 10.7%, (N=3) and 7.2% (N=2) of libraries/resource centres use 4mbps or more (Fig. 8).

It is observed that in the selected sample of the Figure -8, the bandwidth rate of internet is higher speed in 17 libraries/resource centres on account of ISO standard and quantity access for efficient maintenance.

e) Internet Connection in Libraries/ Resource Centres

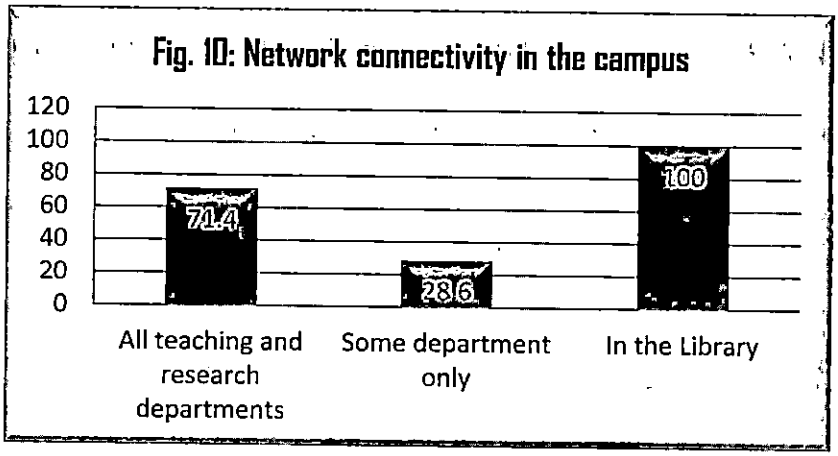
Data on the networking facilities available in libraries/resource centres under study ascertained and the data are presented under figure - 9.



Above figureshows the availability of Internet connectivity in the resource centres. It is found from the figure that among 28 libraries/resource centres, all of them are providing internet facility to the users 100% (N=28).

f)Network connectivity in the campus

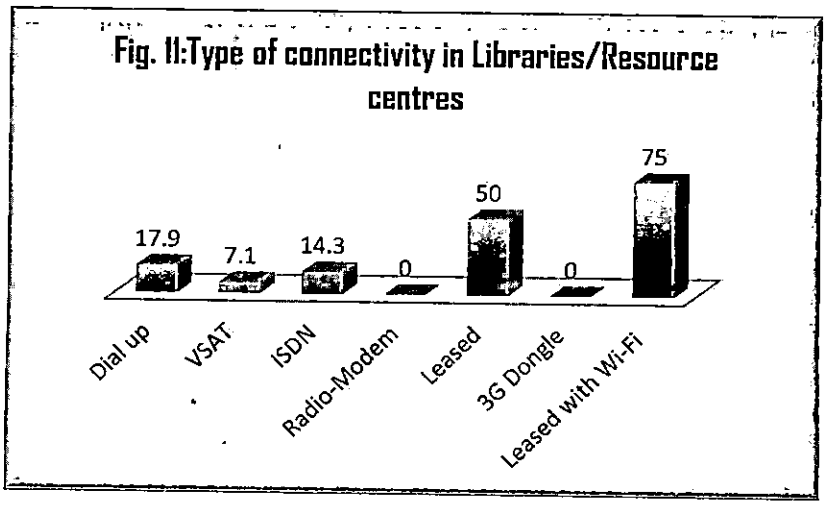
The internet has become indispensable for libraries/resource centres to enhance the collection use and improve services to the users. Librarians were asked to indicate availability of internet in the institutions under study and the data are presented under Figure - 10.



When data are analysed the network connectivity on the campus of the fashion and apparel institutions, it is found that all the 28 libraries/resource centres are connected through network. 71.4% (N=20) of the libraries/resource centres teaching and research departments have network connection and in only 28.6% (N=8) libraries/resource centres of few department are having network connections.

g)Type of connectivity in Libraries/Resource Centres

Further the Librarians were also asked to specify the type of Internet connectivity in the libraries/resource centres. The respondents' data are presented in Figure - 11.



When analysed the type of network connectivity used in libraries/resource centres, it is found that 75% (N=21) of the libraries/resource centres use leased with Wi-fi connectivity, followed by Leased 50%(N=14), Dial up 17.9% (N=5), ISDN 14.3%(N=4), VSAT 7.1%(N=2). Internet can be accessed through different kinds of connections. It is found that the majority of the libraries/resource centres have leased line with Wi-Fi connections and a few libraries have ordinary dialup and VSAT and ISDN.

SUGGESTIONS

The Textile, Design, Fashion and Apparel Institutions' and allied Industry sector Libraries/Resource Centres currently are not forming part of any existing networks either at local or national level. It becomes mandatory and essential to form a network/consortium of Libraries/Resource Centres to explore and exploit the possible benefits of Resource Sharing and Networking with the following objectives.

- To develop consortium of Fashion and Apparel resources.
- To evolve a network of Textile, Design, Fashion and Apparel institutions' in India for an optimum utilisation of information resources.
- To optimise the utilisation of funds by minimising duplication of resources in Textile, Design, Fashion, and Apparel libraries/resource centres.
- To provide access to document collection of the Textile, Design, Fashion and Apparel libraries/resource centres.
- To standardise library/resource centre services and activities.
- To facilitate inter-communication among the Textile, Design, Fashion, and Apparel and allied subject Libraries/resource centres.
- Developing a National Information System for Fashion and Apparel Industry.

7. CONCLUSION

The prevailing situation and the procedures adopted by Textile, Design, Fashion and Apparel Libraries/Resource Centres are possibly advantageous to implement the proposal as there cannot be any ambiguity about the ownership issue for the shared information resources, financial complexities or any other issues existing in other information systems working in the world. Textile Research Associations, Apparel Export Promotion Council, National Design Institutes, National Institutes of Fashion Technology and other related allied centers in India are functioning under the Ministry of Textiles, and Ministry of Commerce and

Industry, Government of India. Though there are various information systems and services existing in the country, the ICT infrastructure is insufficient to meet the upcoming user community in the field of fashion and apparel technology,having common goal with similar aims and objectives, which is an additional factor for considering the implementation of the proposed to Design and Development of National Information System for Fashion and Apparel Industry (NISFAI).

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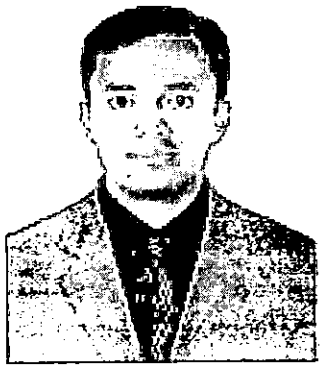
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Adoption of Technology in Emerging Library Services in Management College Libraries in Bangalore: A Study

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Abstract: Meeramani Emerging services in academic libraries includes Digital library systems, Chat reference, Link resolvers, Meta search interfaces, Content management systems, (Cervone, Emerging Technology, Innovation and Digital Library, 2010). Current research aims to study the usage of emerging services by the management school libraries in Bangalore and suggests measures to improve innovative library services in Bangalore. A pilot survey was undertaken to analyze the extent adoption of technology in thirty Management college libraries of Bangalore using convenience sampling. The study suggests using such software enhances the quick e-learning skills of students.

Keywords: Information communication technology, academic libraries, emerging library services, Management Schools,

1. Introduction

Any library, be it physical or virtual is built on four pillars or components namely resources, facilities/services, people and users. Technology is the connecting corridor for all these components and plays a major role in their effective functioning (MANLIBNET, 2015). Technology has been playing a vital role in the changing dimensions of library's functions and services. The term "modern" in modern technology is relative to time; whenever a new innovative idea is incorporated it is called modern. Even the simplest form of technology adopted in the library the "5 x 3 "catalogue card has revolutionized whole cataloguing process and has been a universal standard including the fabrication of catalogue cabinets to store the cards. The content was standardized and catalogue codes were devised to manage the content and also added entries were created to cater

to access needs of the user – Author, Title or Subject catalogue. So library services have been changing since the time of chained libraries.

2. Emerging library and information services

With the rapid advances in emerging technology, it is recognized that the trends in information technology have had a great impact on ways of learning and teaching in academic library settings. Diverse data and information in multi-formats can now be dynamically accessed, distributed, exchanged, shared, stored, transformed, and transmitted across heterogeneous applications, channels, databases, networks, platforms, and systems. Information technology thus opens up the whole world of information and allows teaching and learning to take place beyond the traditional restrictions and resources and deliver knowledge on demand with up to the minute information. Libraries around the world provide following new content in new mediums to an increasingly tech- savvy user group.

- OPAC
- Instant Messaging (IM)
- Mobile Services
- Blogs
- Cloud OPAC
- Social Networking services
- Content Management services
- Web Conferencing
- YouTube/ Edutube

3. Review of literature

Kaur, H and Sharda, P (2010) elaborated on how technological innovations have led to the improved information management and library services. Information technology (IT) and Information Communication Technology (ICT) have changed the information seeking behavior of the users and services being provided by the librarians. Journey from print phase to the era of Electronics (E) has been discussed. How information needs have been changed from asking for a book or a journal to an article or a topic with the provision of E-resources has also been discussed.

Cervone (2010) discusses the issues and impact of emerging technologies and innovation in libraries. He describes overview of the concepts and application of emerging technologies and innovation to library practices. Librarians need to be

careful about how terminology such as emerging technology is used as new in one sector is not new in others and to have credibility, librarians must understand how those differences may play out within their overall organizations. When libraries are situated in parent organizations that value experimentation and innovation, libraries must be willing to experiment and innovate with services and processes.

Thomas et al. (2010) in their paper discussed the challenges and problems posed to the contemporary and conventional library service environment, as the impact of results of ICT applications and the onset of digital revolution. The authors states this would "call for developing new competencies and skills as well as a new set of proficiencies. It also seeks to analyze the role of professional bodies, especially in India, in preparing librarians to meet these challenges. It explains emerging trends in academic librarianship at the global level has been consolidated from the literature that has discussed this problem in various forums and from personal experience". This case study has been undertaken with the aid of the India's premier professional body the "Indian Association of Special Libraries & Information Centres (IASLIC), Kolkata (India)". The "Web 2.0 technologies which have influenced other services are also becoming popular and are being used not only for social networking but also to facilitate communication and increase knowledge sharing in the work environment" states **Ribiere et al (2010)**. To know, understand the factors and assess the impact on "the use of web 2.0 technologies and the influence of national culture on it, data were collected from 376 young adults in the age range of 18-29 from the USA, Thailand and Bahrain". The study resulted into "a model which was developed and statistically tested to understand the influence of national culture traits, social grooming aspects, efficiency, online privacy, perceived usefulness, subjective norms and gender". The study has based "the types of web 2.0 usage different variables were demonstrated to be significant predictors. For expressive usage, uncertainty avoidance, maintaining relationships, online privacy and perceived usefulness were significant. For instrumental usage, long-term orientation and perceived usefulness were significant". A ranking of various types of web 2.0 platforms and their usage was also done and it shows a very few differences among the case study countries.

4. Objectives of the Study:

- To identify technology driven and emerging LIS services
- To explore the availability of IT facilities to administer the new LIS Services
- To find the required skills and knowledge among LIS manpower to execute the service

5. Methodology

Keeping in view the emerging library and information services of Management school libraries in Bangalore, a **structures questionnaire** is designed for collecting data. The questionnaire was distributed to a sample of 500 MBA college librarians and users. The number of questionnaire distributed and responses were received are presented in the following table.

Table 1. Total Number of Respondents

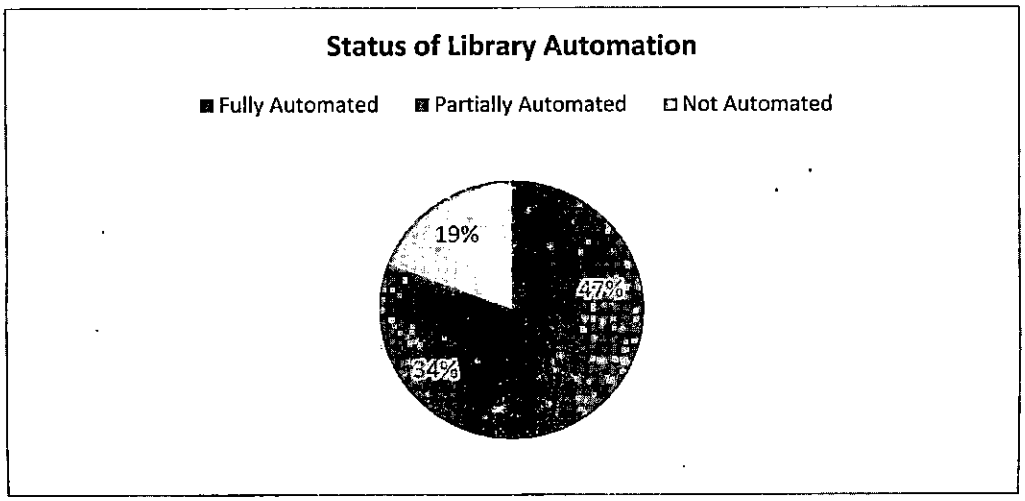
Category of Respondents	Number of questionnaires distributed	No. of responses received	Percentage
Librarians	150	130	87%
Users	350	300	85.7%

The mode of collection of data, its representation, analysis and interpretation are presented in the form of tables and graphs.

6. Data Analysis

Status of library automation

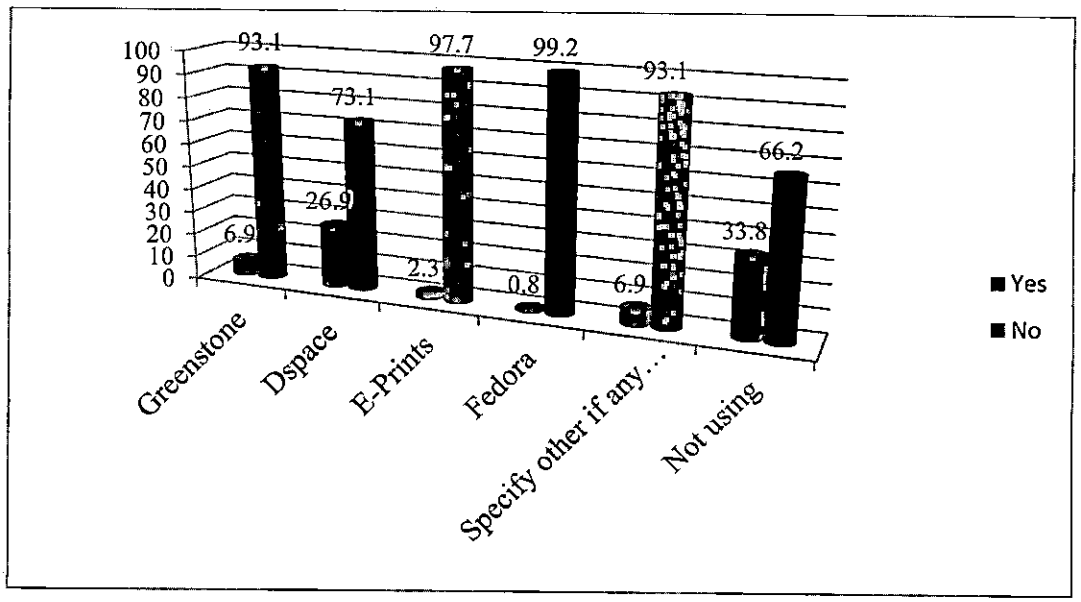
The status of library automation of the colleges under study is profiled and the data is presented in figure



This figure shows that 61 (47%) colleges are fully automated. We also learn that 44 (33.8%) of college libraries are partially automated and 25 (19.2%) libraries have not automated their services. However as per the present assessment and accreditation criteria, the libraries should be fully equipped for the application of ICT in all respects. Due to availability of open source software (OSS) in integrated library management systems (ILMS), the automation of library operations are much more feasible and cost effective.

Digital library software in use:

Apart from the library automation software used by the libraries, the next facility libraries require is the digital library software (DLS). Most of the libraries intend to create digital libraries of archives, Institutional Repository (IR) and other digital document management services. So this study has made an attempt to find out which digital library software is in use in the libraries under study.



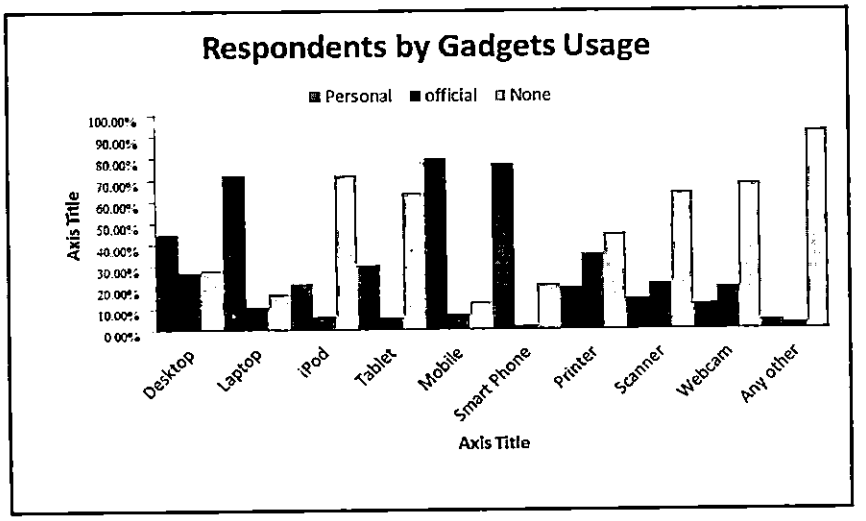
The study has selected some very popular digital library software as well as library automation software with facility for digital library creation and maintenance for gathering information from the respondents.

This study shows that 26.9% of the libraries are using Dspace, one of the most popular digital softwares; 6.9% of libraries using Greenstone digital library software; 2.3% of the libraries are using E-prints and only 0.8% of the libraries are using Fedora. 6.9% of the libraries are using Easylib, Libsoft, Google site, Koha

etc. which can digital library service and 33.8% of the libraries are not using any digital library software.

Use of electronic gadgets – computing and communication devices:

The computer and communication devices evolved over years with the advances in microprocessor technologies and the age of micronisation to miniaturization has emerged during the last one decade. The desktop computers have gradually given way to Notebooks and Laptops. Now the Tablets and iPads are replacing the Laptops though not in a very large measure but preferred for the 'mobility' and 'portability' of devices. The mobile is becoming one of the vital devices now in the library services visualizing the concept of "Any where Library". So a detailed enquiry was made with the respondents on the use of the various electronic gadgets used in computing and communication of information in their personal and official capacities and environments. The data on the use of various electronic devices – computing and communication purposes is presented below.



It is found from among the computing communication devices that 79.7% of the respondents have personal mobiles and 7.30% have official whereas 13% of the respondents do not have mobiles; 77% of the respondents have personal smart phones and 1.70% of the respondents have official smart phone whereas 21.30% of the respondents do not have smart phones; 72% have personal laptops and 11% have official laptops whereas 17% do not have laptops; 44.7% of the respondents have personal desktops and 27% have official desktops whereas 28.30% do not have a desktop;

Among the emerging devices; 21.5% have personal iPods and 6.4% have official iPods whereas 72.1% do not have iPods; 30.30% of the respondents have personal tablets and 6% of the respondents have official tablets whereas 63.70% do not have tablets.

In the context of other devices and accessories for the information output 19.70% of the respondents have personal printers and 35.30% of the respondents have official printers whereas 45% of the respondents do not have printers; 14.70% of the respondents have personal scanners and 21.70% of the respondents have official scanners whereas 63.70% of the respondents do not have scanners; 12% of the respondents have personal webcam and 20% of the respondents have official webcam whereas 68% of the respondents do not have webcam.

The distribution of the data is visualized to be very logical and regulated by the time frame of the evolution of the devices, for example the desktop is gradually replacing the laptops and the tablet is used more than the iPods and the latter is more recent than the former and similarly, the mobile comes to be in the highest use among all devices due to its dual use for both in computing (email, calculation, word processing) and communication.

Frequency of computer use and purpose:

Information regarding the frequency of use of the services like daily, weekly, fortnightly and monthly basis was elicited.

Frequency of computer use ((a) Information and (b) Social Media)

Purpose	Not used	Rarely	Monthly	Fortnightly	Weekly	Daily
Information based service						
Use library databases	42 (14.0%)	78 (26.0%)	59(19.7)%	25(8.3%)	78(26.0%)	18(6.0%)
Read online professional articles	38(12.7%)	61(20.3%)	49(16.3%)	45(15.0%)	73(24.3%)	34(11.3%)
Read articles on my iPad/ tablet	89(29.8%)	104(34.8%)	42(14.0%)	17(5.4%)	36(12.0%)	12(4.0%)
Web 2.0 Platform						
Use social media	06(2.0%)	59(19.7%)	14(4.7%)	14(4.7%)	44(14.7%)	163(54.3%)
Read blogs	71(23.7%)	56(18.7%)	27(9.0%)	33(11.0%)	49(16.3%)	64(21.3%)
Use Wikipedia	40(13.3%)	24(8.0%)	35(11.7%)	42(14.0%)	103(34.3%)	56(18.7%)
Use RSS	157(52.7%)	76(25.5%)	24(8.1%)	13(4.4%)	24(8.1%)	4(1.3%)
Any other site (Specify)	281(93.7%)	19(6.3%)	0.00%	0.00%	0.00%	0.00%

This table shows the frequency of use of two services - (a) information based (b) Web 2.0 platforms used by the users:

Information based services

Only 6% of the population say that they use library databases on a daily basis: 26% of the users say that they use library databases on a weekly basis; 8.3% of

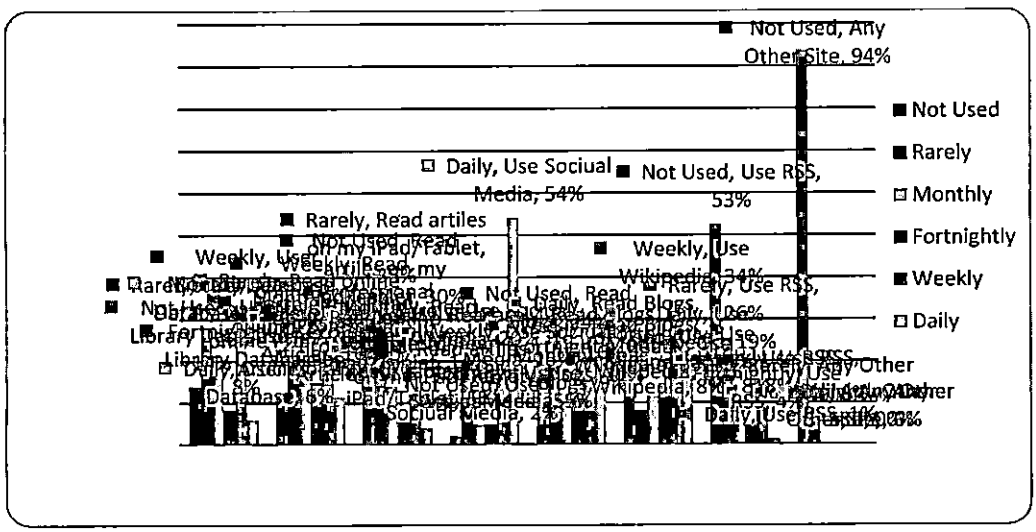
them say that they use it on a fortnightly basis; 19.7% of the users say that they use library databases on a monthly basis whereas 26% of users say that they rarely use the databases. However, 14% of the users have not provided any information about it.

Online professional articles :

Only 11.3% of the users say that they read online professional articles on a daily basis; 24% of the users say that they read online professional articles on a weekly basis; 15% say that they read online professional articles on a fortnightly basis; 16.3% of the users say that they read online professional articles on monthly basis; 20.3% of the users say that they rarely read the online professional articles. However 12.7% of the users have not provided any information about it.

Articles on iPad:

Only 4.0% users say that they read articles on their iPad or tablet on a daily basis; 12.0% of the users say that they read articles on their iPad or tablet weekly basis; 5.4% of the users say that they read articles on their iPad or tablet on a fortnightly basis and 14% say that they read articles on their iPad or tablet on monthly basis whereas 34.8% of the users say that they rarely read the articles on their iPad or tablet. However 29.8% of the users have not provided any information about it.



Frequency of computer use

Table 5.2.4.1 also shows the frequency of use of web 2.0 platforms (blogs, wikis& social media). The details are given below.

- 54.3% of the users say that they use social media on a daily basis; 14.7% say that they use social media on weekly basis; 4.7 % of the users say that they use social media on a fortnightly basis; and an equal number of them say that they use social media on monthly basis. Whereas 19.7% of the users say that they rarely use the social media only 2.0% of the users have not provided any information about it.
- 21.3% of the users say that they read blogs on daily basis; 16.3% of the users on weekly basis; 11.0% of the users on a fortnightly basis and 9 % of the users on a monthly basis. However 18.7% of the users say that they rarely read the blogs; and 23% of the users have not provided any information about it.
- 18.7% of the users say that they use Wikipedia on daily basis; 34.3% of the users on weekly basis; 14.0% of the users on a fortnightly basis whereas 11.7% of the users say that they use Wikipedia on monthly basis. 8.0% of the users say that they rarely use Wikipedia whereas 13.3% of the users have not provided any information about it.
- Only 1.3% of the users say that they use RSS on daily basis; 8.1% of the users on a weekly basis; 4.4% of the users on a fortnightly basis and 8.1% of users say that they use RSS on monthly basis. However, 25.5% of the users say that they rarely use the RSS while 52.7% of the users have not provided any information at all.
- Other sites: 93.7% of the users have not provided any information about any other sites other than the once given here. But 6.3% of the users have said that they rarely use any other site other than the ones mentioned here.

Table 5.2.4.1 reveals clearly the most evident distribution of the frequency of use of the internet based services. It can be seen that the social media is the most used service with 54.3% of responses on a daily basis. The second in rank is the use of Blogs and the third in rank is the use of Wikipedia with 18.7% of users. A majority of the users do not seen to be familiar with RSS.

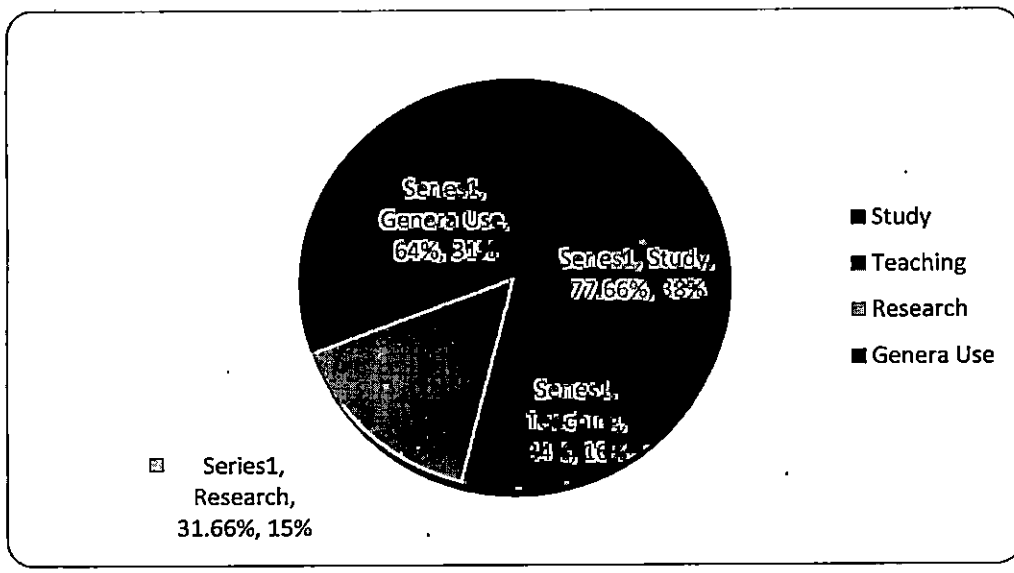
Purpose of computer use:

Purpose of computer use: (i) Study, (ii) Teaching and (iii) research

Purpose	Number of users	Percentage
Study	233	77.66%
Teaching	102	34%
Research	095	31.66%
Genera Use	193	64%

The table given above presents information regarding the purpose for which

computer systems in the library were used. It is clear that 77.66% of the users used it for study purposes and 64% of the users used the systems for getting general information. On the other hand 34% of the users have reported that they used the system for collecting information teaching purposes and 31.66% of them have declared that they used the systems for research purposes.



7. Conclusions

The libraries should plan and innovate new and need based services to evoke strategies for the use of emerging library and information services in the management colleges. In this study the literature survey in this study has given enough guidance in this regard. The second aspect is to adapt to the technological developments in the library services and attempt to acquire more and more electronic resources as they are well used in study, teaching and research. The third and final decision in this regard is to plan and deliver extensive information and media literacy programmes to bring awareness and knowledge about some of the key issues like the emerging electronic resources in management studies and the legal aspects on the use of electronic and/or digital resources. The management school libraries are still lacking adequately skilled manpower to handle the emerging technologies hence the skill development programmes to both library staff and users be organised periodically. The management schools' library and information professional organisations like the MANLIBNET should think of building a "Management Subject Gateway" so that authentic and vast

internet and Web resources are made available to the users at a single click of a key press.

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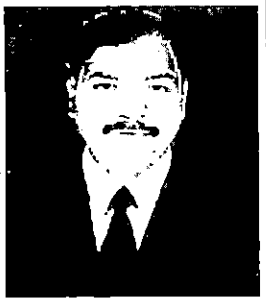
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Application and Impact of Information Communication Technology in University Libraries with special Reference to Kenya

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Abstract: Growth of IT and its use have forced libraries to change their strategies for development and existence. The present study identifies various components of ICT which are used in libraries and bring to scene the various reasons of computer use in libraries in connection with other modern technologies.

Keywords: Electronic information, Electronic resources, Metadata, ICT, Library

1. Introduction

A university library is an important information channel and resource for research that supports the educator's teaching and students' learning. The rapid exponential growth of information has made it necessary for librarians and information scientists to employ new techniques to cope with the massive proliferation of literature in all subject fields. This age of information explosion/overload, keeping track of information resource and managing the same are the key concern to the librarians in regard of meeting the needs of library users. Application of Information Technology in libraries has brought a revolution to traditional library from being taken as a storehouse of books to be an intellectual information centre. The gradual shift from traditional library to electronic library is a matter of investable as global access beyond the four walls of a library is achieved and users can easily get the information within a spur of microsecond. The use of Information and Communication Technology in libraries plays a vital role in facilitating access to global information and resources which ensure higher growth in various sectors of human life and these calls for gradual change on what the library collection should be in order to satisfy the user needs.

Academic libraries are using modern ICTs to automate their core functions, implement efficient and effective library cooperation and resource sharing networks, implement management information systems, develop institutional repositories of digital local contents, and digital libraries: and initiate ICT based capacity building programmes for library users. Information and Communication Technology (ICT) has brought unprecedented changes and transformation to academic library and information services, conventional LIS such as OPAC, users services, reference services, bibliographic ser-

vices, current awareness services, Document delivery, interlibrary loan, Audio visual services and customer relations can be provided more efficiently and effectively using ICT, as they offer convenient time, place, cost effectiveness, faster and most-up-to-date dissemination and end users involvement in the library and information services process.

The impact of ICT characterized on information services by changes in format, contents and method of production and contents and method of production and delivery of information products. Emergence of internet as the largest repository of information and knowledge, changed role of library and information science professionals from intermediary to facilitator, new tools for dissemination of information and shift from physical to virtual services environment and extinction of some conventional information services and emergence of new and innovation web based.

2. Meaning of Information and Communication Technology

ICT is an acronym that stands for Information Communications Technology. ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form. ICT is concerned with the storage, retrieval, manipulation, transmission or receipt of digital data. The term "ICT" describes the use of computer-based technology and the Internet to make information and communication services available to a wide range of users. The various components of ICT are as, various types of computers, Communication media, Reprographic, micrographic and printing technology which are being used in university libraries for ease library management and bring services and information resources to users.

3. University libraries in Kenya

University libraries are generally categorized under academic libraries. University libraries play a central role in the university. Their primary responsibility is to assist their users in the process of transforming information to knowledge. Librarian in the university co-ordinates the evaluation and selection of information resources required for the various programs, organizes and maintains the collection of these resources.

Otike (2004) asserts that the development of University Libraries in Kenya can be traced to the colonial era, though it was not well marked as that of special and public libraries; the main reason being that there were very few academic institutions at that time. Enormous expansion of academic library was seen during the post independence period when there was massive growth in higher education. Universities and university librarians for

quite some time have experienced a great challenge in their profession, a challenge that has nearly rendered them obsolete. One of the major issues that are putting libraries at stake is lack of a firm librarians' body that is meant to address librarian's issues. Lack of unity among libraries and librarians, for instance, with the growth and expansion of institutions of higher learning, many universities are now offering Library and Information studies degree programmes.

However, there is no library body, association or board that is in place to clearly regulate the quality of programmes being offered. All institutions run and function independently; as a result, some of the programmes offered in the institutions may be questioned.

4. Development of academic libraries in Kenya

Developing academic libraries encompass a lot of professionalism, proper management, right resources, personnel, equipment and facilities. Proper development and establishment of academic libraries cannot be achieved if librarians are not involved right from the initial stage. Development and establishment of academic library in this information age is not easy, unlike some decades ago where library services were focused on a systematic approach, that is, to help patrons retrieve materials from the information system, in the present decade it is all about being a user centered approach that is fulfilling the patron's "information need. Books are not the only source of information in this decade and librarians have to go a notch higher to assist users' access and make use of the libraries.

The current development stages and practice in University Libraries in Kenya vary and range from automation, electronic resource services, and digitization of information, capacity building, and staffing issues among others. The development and establishment of academic libraries has to involve, the staff, the building, information resources and in this information age, information technology.

5. Present scenario of ICT in Kenya

The quest for Kenyan higher education has seen tremendous growth over the last decade. Kenya's education sector has achieved many milestones since independence. However due to challenges of high population and unsustainable utilization of resources, Kenya is faced with many challenges that require urgent reforms to be able to sustain the ever increasing demand for education.

Kenya being a developing country is faced with more intakes of students to higher learning institutions and is trying its level best to get equipped with the latest technology like open access system to ensure users get the information they need across the

globe.

6. Applications of IT in libraries

A process of mechanization of library operations which are of a routine and repetitive nature whereby housekeeping operations like acquisition, serial control, cataloguing, circulation, references and administration work are done. In wider sense, it can be said that computerization of all library operations is known as Library Automation. Now it is being used extensively in libraries by developed countries and in a limited scale in developing countries. Kenyan Universities are making use of ICT in their libraries thus benefiting with availability, accuracy, accessibility, flexibility, usefulness and timeliness whereby after information is being published is accessed all over. Today, information technology coupled with computer technology has conquered space and time with regard to dissemination of information. library's procedures which have been computerized are as follows,

1. Acquisition
2. Cataloguing and Indexing
3. Circulation
4. Serial Control
5. Library Administration and Management;
6. Online Public Access Catalogue
7. CDROM Database Searches
8. Resource sharing through Library
9. Network/INTERNE
10. Desktop Publishing (DTP)
11. Office Automation
12. Information Retrieval

Information Resource Building:

Acquisition of books, monographs, audio-visual, electronic materials such as CD-ROM, maps and so on. There are some specific functions of an acquisition process. (Suggestion, recommendations and selection of library collection

1. Duplication checking / library holding checking
2. An vender selection
3. Preparation of order/cancellation of order lists with terms and
4. Conditions of the supply
5. Checking of overdue orders

6. Record of items on order
7. Record of received and non-received items and receipt to the vender
8. Items verification with order file and invoice
9. Inspection of items by the concerned department
10. Prepare for payment after accessioning
11. Preparation budget and maintain accounts and statistics subject wise
12. Final report (Items/subjects wise/chronologically/booksellers reported

7. Data Entry:

In regard to data entry, Database is required for each: Books, Clients/Members, Serials, Audio-visuals, CD-ROMS, Floppies, Gifted items, Maps, Reports etc.

Classification and Cataloguing:

Classification and cataloguing is one of the core roles of a library and it can be of various types like Catalogue card production, On-line cataloguing, Duplication checking of catalogue cards, Production of duplicate catalogue cards, Preparation of authority file subject heading list, Shorting, checking and filing of catalogue cards, Automatic generation of added entries (author, title, series, Generation of monthly accession list, Developing centralized and on-line cataloguing.

8. Circulation Control:

Issuing and return of the library materials by the users is done trough circulation section. The various works done in circulation control are, Registration/cancellation and make time for membership, Issue, return, renew reservation of documents and produce the slip for proof, Charges for late, lost book, binding and production of penalty slip, Maintenance of circulation statistics, Inter library loan, Use of bar code system and last but not least, Report/statistics of circulation.

9. Serial Control:

Serial plays a vital role as far as library is concern like, Input essential serials data, Order list of new serials, Mode of payment, prepare for payment, Receipt and updating the records,

Receipt to vendors or publishers, Preparing the list of present holdings, additions, missing, cancelled, Serials chronologically, subject-wise, Renewal and cancellation of present subscriptions, Sending reminders and follow-up of missing issues, Binding control, accession register

of bound serials, Prepare budget and maintain accounts/statistics - subject wise, binding to ensure that library functions well.

10. Documentation and allied services:

The work of library documentation and allied services ensures that library functions well and by such, it can be of various ways like, Indexing and abstracting of micro and macro documents, Thesaurus construction, Compilation of union catalogue, Bibliographical control, Current Awareness Services (CAS), Literature search, Selective Dissemination of Information (SDI) and Newspaper clippings.

11. Information Retrieval:

The information when needed can be easily retrieved to meet the needs of users. Information retrieval can be of various ways like, Database creation and maintenance, interactive searching, saving of in vv house as well as external databases, Search and print outs of queries against specified requirement Information about the books (issued, reserved, lost, overdue, weed out), member-ship, inter library loan, penalty charges, periodicals, newspaper clippings, reports etc, according alphabetically, chronologically, subject-wise, members wise, keywords with each particular such as accession no-wise, title, author, call number, edition etc.

12. Impact of information technology on libraries

No doubt, there are lots of changes in life as a result of changes in technology and library is not an exceptional to such changes. The various impact of ICT in library is as,

1. Information technology has helped library professionals to provide value added quality information to its users,
2. Ensured more access to national and internal resources
3. Facilitated to the storage of huge amount of data in a compact space
4. Retrieval of information is faster.
5. The term library has lost its true meaning on what it used to be in the gone period as library nowadays no longer refers to only physical building(s) located in a specific location, but refers as a digital library which can be accessed from anywhere at any time as its collections is not only of physical resources like books, periodicals, videos and films which are stored physically in the library building, but includes digital resources like e-books, e-journals and e-news-

papers whose access is not restricted to specific hours and place in physical library building.

6. Use of information and communication technology has made information that is created in a digital form, online access and file transfer possible as a result of use of ICT as networking and sharing of information is possible.

13. Conclusion

The library is a resource centre. The emergency of Information Technology in the modern era has brought many challenges and changes in the library and Information science whereby the traditional concept of library has changed from being a store house of books to an intellectual information centre, thus promoting global access to information crossing the geographical limitation barriers and making library to facilitate access to global information and resources. Thus, it is clear that use of electronic information sources will inexorably displace traditional sources. Study argues that the provision of library services in Kenyan universities is characterized by extremely inadequate resources in terms of funds, information materials, equipment and staff. Although there is widespread opinion among students, lecturers as well as university administrators that university libraries play a critical role in the teaching, research, and learning activities, there is also awareness that university libraries in Kenya, especially those in public universities are not effectively providing services which has limited their role in research and learning in the university. Finally, modern information and communication technology is being incorporated in the management of university libraries in Kenya. However, this trend has been hindered by lack of funds to purchase equipment such as computers and set up networks, lack of skilled personnel in information technology, poor telecommunications infrastructure in the country. There is therefore need for adoption of strategic planning in all areas of library management and to remain viable sources of information, university libraries in Kenya have to make use modern information and communication technology to enable university libraries to facilitate better access to local and global information resources and librarians should go for continuing education programmes in order to be well versed with the latest technology and implement such technology in libraries.

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APPLICATION OF STRESS MANAGEMENT IN COLLEGE LIBRARIES IN HARYANA: AN EVALUATIVE STUDY

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Abstract: The present study explores stress and its management in general and in libraries. The present study explores the stress among library professionals in college libraries of Haryana. For the purpose a questionnaire is distributed among 40 librarians of degree colleges libraries affiliated to KUK, MDU and Deenbandu Chotu Ram university and researcher got back 32 (80%) filled questionnaires and same analyzed to know the stress among library professionals. After analyzing data it is revealed that library professionals have stress due to some reasons. The study is also suggested the methods of managing stress of library professionals. At the last of the study some suggestions and recommendations are made for managing the stress basis upon the study.

Keywords: Stress, Stress Management, Higher Education, Library Professionals, Social Stress.

1. Introduction:

The Haryana State has 6 universities and 4 deemed universities to ripen the education program in Haryana. The KUK University's programs combine the enduring value of a liberal arts education with the skills and experience offered by professional departments. The University has 445 teaching faculty members. The University also has 457 affiliated colleges and institutes in the Districts of Ambala, Panipat, Kaithal, Yamuna Nagar, Hisar, Fatehabad, Jind, Karnal, Sirsa, Kurukshetra and Panchkula. Maharshi Dayanand University, established as Rohtak University, Rohtak, came into existence by an Act No. 25 of 1975 of the Haryana Legislative Assembly in 1976. There are 130 degree college affiliated to MDU besides this university has more other affiliated college like engineering, architecture, management and medical etc. Deenbandhu Chhotu Ram University of Science & Technology, Murthal came into existence on 6th November 2006 by upgrading erstwhile Chhotu Ram State College of Engineering, Murthal through an Act 29 of 2006 of the Legislature of the state of Haryana with the vision to facilitate and promote studies and research in emerging areas of higher education with focus on

new frontiers of science, engineering, technology, architecture and management studies, humanities, and also to achieve excellence in these and connected fields. There are 20 college affiliated to this university[1].

All the colleges have well established libraries in their premise to cater the need of students' community through qualified staff. Staff is most important asset in any organization, institution and academic Institutions. All the development and progress of any institution depend on staff of that particular institute. The nature of library work is differ from any other organization, here is repetitive work, students mob, dissatisfaction of uses, lack of funds, attitude of library a authorities etc. may create stress among library professionals.

Stress:

Stress has become a part of our lives. The causes can be multiple – work related problems, family situations, education of children, lack of satisfaction in what we do etc. In simple word stress is a tension convert into a disease to any employee of any institute and there is emergent need to cure this types of tension (stress) of staff among any organization. Dr. Hans Selye, the father of stress theory, defined stress as "the nonspecific response of the body to any demand made upon it." The "demand" can be a threat, a challenge or any kind of change which requires the body to adapt. The response is automatic and immediate. Stress can be good (called "eustress") when it helps us perform better, or it can be bad ("distress") when it causes upset or makes us sick.[2]

Many aspects of the daily life and the library profession in particular, may create feelings of stress. Stress, in fact, is a normal and inescapable part of life. However, too much continued stress can have a serious negative impact on our health, our work, our relationships, and the joy and satisfaction that we experience in library work.[3]

Library stress can be defined as the most harmful physical and emotional responses that occur within a human being. Some experts argue that moderate amount of both physical and mental stress is required for a normal and healthy growth. A little degree of stress at libraries energizes the employees psychologically and physically as it motivates them to learn new skill and master their jobs resulting in increased productivity[4]

1 https://en.wikipedia.org/wiki/Haryana#Education Dt. of access 11-10-16

2 http://www.mental.health.wa.gov.au/one/resource/46/Stress%20document.pdf Dt. of access 12-10-16

3 http://www.infopeople.org/workshop/instructor/121 Dt. of access 17-10-16

4 Sharma, U C; Bhatnagar, Mohit and Mange Ram (November 2008). Managing Stress in Libraries: an Effective Approach' Digital Library Communication (DLIBCOM), Volume 3 Issue 10, Ahmedabad.

Stress Management:

There are very many proven skills that we can use to manage stress in any organization including library also. These help us to remain calm and effective high pressure situation and help us avoid the problem of long stress. To manage and minimize stress is called stress management. Stress management is very essential and important tool for achieving line growth. To be one's best and to be able to perform to one's potential, stress needs to be avoided. We are able to enjoy what we do only if we have a relaxed mind and body. Given below are certain tips, which can help you reduce stress. Stress may be managed by number of activities like yoga, regular exercises, meditation, and take up a hobby etc.

2. Scope:

The present study is confined to library professionals of degree colleges' libraries of Haryana especially selected colleges libraries under the affiliation of KUK, MDU and *Deenbandhu Chhotu Ram* University of Science and Technology.

3. Data Analysis

For fulfill the purpose the study a questionnaire is framed and distributed among 40 librarians of degree colleges libraries affiliated to KUK, MDU and Deenbandu Chotu Ram University of Science and Technology and researcher got back 32 (80%) filled questionnaires and same analyzed to know the stress among library professionals in concerned libraries. The data is analyzed in graphic and tabular form as follows:

Stress

Do you feel any stress due to the followings in your library

S.N	Problems	Stress Level				
		1	2	3	4	5
1	Furniture is not adequate	4	6	**9**	6	7
2	Lack of Equipments	4	4	**12**	8	4
3	Lack of Finance	--	--	**16**	6	10
4	Poor Maintenance of Building	2	6	**14**	8	2
5	Bad atmosphere	4	2	6	6	**14**
6	Staff are not adequate	2	6	**12**	8	4

7	Users are not satisfied	2	2	**12**	10	6
8	Overloaded	2	**10**	8	8	4

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

Table no 3.1.1.shows the following

- **9 (28.12%)** library professionals say that they feel stress due to 'non-adequacy of furniture' up to some extent.
- **12 (37.5%)** library professionals say that they feel stress due to 'lack of equipment' up to some extent.
- **16 (50%)** library professionals say that they feel stress due to 'lack of finance' up to some extent in their library.
- **14 (43.75%)** library professionals say that they feel stress due to 'poor maintenance of building' up to some extent in their library.
- **14 (43.75%)** library professionals say that they do not feel stress due to 'bad atmosphere' in their library.
- **12 (37.5%)** library professionals say that they feel stress due to 'lack of staff' up to some extent.
- **12 (37.5%)** library professionals say that they feel stress due to 'dissatisfaction of users' in their library up to some extent.
- **10 (31.25%)** library professionals say that they feel stress due to 'overloaded' in their library up to great extent.

Level of Stress

Indicate the extent of stress you feel due to these reason

S.N	Authority	Stress Level				
		100 %	75%	50%	25 %	Not at all
1	Job Uncertainty	--	8	**12**	2	10
2	Harassment by Managing Authority	--	4	10	**12**	6
3	Fear of Job	2	4	**10**	8	8
4	Promotion Failure	2	8	4	4	**14**
5	Impose responsibility for Loss of Books	6	**16**	2	6	2
6	Low Pay and Perks	-	2	8	8	**14**
7	Lack of Training & Development Program	4	-	**12**	6	10

Table no 3.1.2. shows the following

- **12 (37.5%)** library professionals say that they feel stress due to 'job uncertainty' up to 50%.
- **12 (37.5%)** library professionals say that they feel stress due to 'harassment by managing authority' up to 25%.
- **10 (31.25%)** library professionals say that they feel stress due to 'fear of job' in their library up to 50%.
- **14 (43.75%)** library professionals say that they do not feel stress due to 'promotion failure' up to some extent in their library.
- **16 (50%)** library professionals say that they feel stress due to 'impose responsibility for loss of books' up to 75% in their library.
- **14 (43.75%)** library professionals say that they do not feel stress due to 'low pay and perks' in their library.
- **12 (37.5%)** library professionals say that they feel stress due to 'lack of training & development program' up to 50%.

3.1.3. Have you opted a library Committee member by the authority

Yes	No
20	12

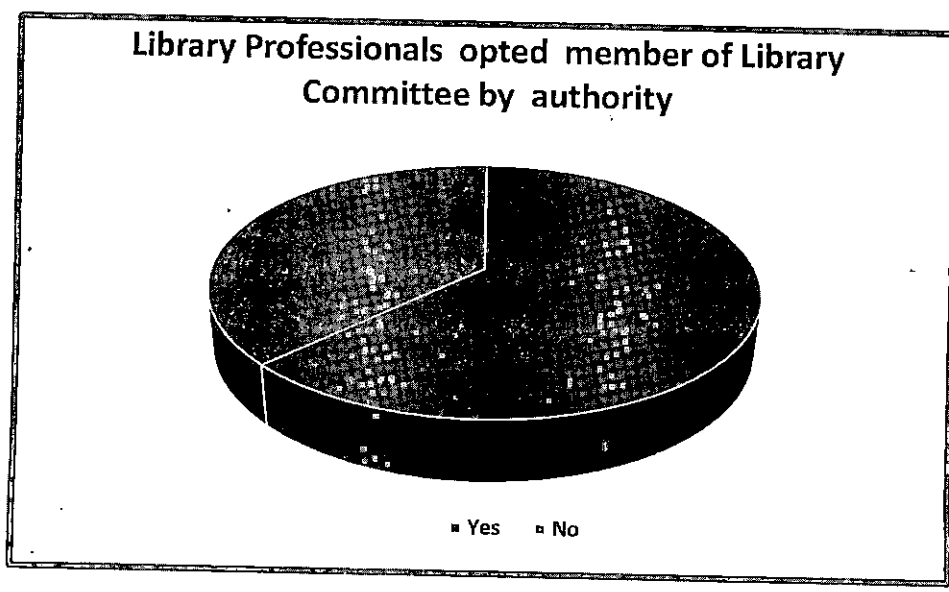


Table no 3.1.3 show that 20 (62.5%) library professional opted as library committee members by the authorities of concerned colleges.

3.1.4. Working Condition

S.N	Working Condition	Stress Level				
		100 %	75%	50%	25 %	Not at all
1	At library/ Work place	2	**10**	6	6	8
2	Repetitive work	4	**11**	4	8	5
3	Long Hours	--	4	**12**	8	8
4	Too little works	--	4	4	8	**16**

Table no 3.1.4.shows the following

- **10 (31.25%)** library professionals say that they feel stress due to working condition 'at library/ work place' in their library up to 75%.
- **11 (34.37%)** library professionals say that they feel stress due to 'repetitive work' in their library up to 75%.
- **12 (37.5%)** library professionals say that they feel stress due to 'long hours' up to 50% in their library.
- **16 (50%)** library professionals say that they do not feel stress due to 'too little works' in their library.

3.1.5. Social Stress

S.N	Social Stress	Stress Level				
		100 %	75%	50%	25 %	Not at all
1	Lack of job satisfactions	--	6	10	4	**12**
2	Bad relations with colleagues & higher authority	--	--	6	8	**18**
3	Disturbed by student Union	--	--	6	--	**26**

Table no 3.1.5.shows the following

- **12 (37.5%)** library professionals say that they do not feel stress due to 'lack of job satisfactions in their library.
- **18 (56.25%)** library professionals say that they do not feel stress due to 'bad relations with colleagues & higher authority' in their library.
- **26 (81.25%)** library professionals say that they do not feel stress due to 'student union' in their library.

3.1.6. Do you think the following health problems are facing by you after join the service?

S.N	Meditation	Stress Level				
		100 %	75%	50%	25 %	Not at all
1	Thyroid	--	--	--	4	**28**
2	Low Sight	4	--	2	**14**	12
3	Blood Pressure	2	-	4	-	**26**
4	Diabetes	--	--	8	**24**	--
5	Migraine	--	2	2	2	**26**
6	Hearing	--	--	2	4	**26**
7	Asthma	**5**	6	**8**	7	6

Table no 3.1.6. shows the following

- **28 (87.5%)** library professionals say that they do not have 'thyroid' problem after joining services.
- **14 (43.75%)** library professionals say that they have 'low sight' problem after joining service up to 25%.
- **26 (81.25%)** library professionals say that they do not have 'blood pressure' problem after joining services.
- **24 (43.75%)** library professionals say that they have 'diabetes' problem after joining service up to 25%.
- **26 (81.25%)** library professionals say that they do not have 'migraine' problem after joining services.
- **26 (81.25%)** library professionals say that they do not have 'hearing' problem after joining services.
- **8 (25%)** library professionals say that they have 'asthma' problem after joining services up to 50%.

Managing Stress:-

3.2.1. Do you feel that the following methods may manage stress

S.N	Approaches	Stress Management				
		1	2	3	4	5
1	Rotation of work	**12**	6	6	8	--
2	Distribution of work	**16**	6	4	6	
3	Good Physical Condition of library	**16**	4	8	4	
4	Time to Time promotion	**20**	10	--	2	
5	Training of Staff	**18**	10	4		

6	Lecture/Seminars/workshop on manage stress	**20**	8	4		
7	Awards/Reward to best worker	**18**	8	6		
8	Participative management	**20**	8	4		
9	Cumulative Responsibility	**18**	8	6		
10	Write-off policy of Books	**16**	12	2	2	
11	Personal grooming activities like meditations, exercise etc	10	**12**	6	4	
12	Sufficient staff to manage the patrons	14	**16**	2		
13	Yoga & Meditation	11	**13**	8		

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

Table no 3.2.1. shows the following

- **12 (37.5%)** library professionals say that 'rotation of work' may manage stress up to full extent.
- **16 (50%)** library professionals say that 'distribution of work' may manage stress up to full extent.
- **16 (50%)** library professionals say that 'good physical condition of library' may manage stress up to full extent.
- **20 (62.5%)** library professionals say that 'time to time promotion' may manage stress up to full extent.
- **18 (56.25%)** library professionals say that 'training of staff' may manage stress up to full extent.
- **20 (62.5%)** library professionals say that 'lecture/seminars/workshop on manage stress' may manage stress up to full extent.
- **18 (56.25%)** library professionals say that 'awards/reward to best worker' may manage stress up to full extent.
- **20 (62.5%)** library professionals say that 'participative management' may manage stress up to full extent.
- **18 (56.25%)** library professionals say that 'cumulative responsibility' may manage stress up to full extent.
- **16 (50%)** library professionals say that 'write-off policy of books' may manage stress up to full extent.
- **12 (37.5%)** library professionals say that 'personal grooming activities like meditations, exercise etc.' may manage stress up to great extent.
- **16 (50%)** library professionals say that 'sufficient staff to manage the patrons' may manage stress up to great extent.

- **13 (40.62%)** library professionals say that 'yoga & meditation' may manage stress up to great extent.

4. Findings and Recommendations

- As per table no 3.1.1 major findings are that lack of finance and works overloaded are the reason of stress among library professionals. It is recommended here that more funds should be allocated to colleges' libraries and work should be allocated in balanced way and more staff should be appointed to reduce work overload and stress.
- As per 3.1.2. most of the libraries professional feel stress due to impose the responsibility for loss of books, it is recommended here that library authority should frame write-off policy of books and professional should not consider responsible for this task.
- It is also recommended here that training and development program should be organizes by the library authority to develop skills of library professionals.
- 37% library professionals (Table no 3.1.3) are not library committee members. It is also recommended here that at least librarian should be opted as library committee member.
- As per table no 3.1.4 repetitive work of library is the reason of stress among library profession. It is recommended here that there should be rotation system for solve this problem. As per this table there is long working hour's also creating stress among library professionals. It is recommended here that working hour of the library should be as per norms and library professionals should be avoided from long working hours.
- As per table no 3.1.5. most of the library professionals not having social stress on them.
- As per table no 3.1.6 library professional got diabetes and low eye sight after joining library, this is the result of stress and working tension. It is recommended here that library authorities should arrange medical camp and should reduce stress among library professionals via different methods of stress management.
- As per table no 3.2.1 most of the library professionals are agree that the following methods may manage stress:
- Rotation of work
- Distribution of work
- Good Physical Condition of library
- Time to Time promotion
- Training of Staff
- Lecture/Seminars/workshop on manage stress

- Awards/Reward to best worker
- Participative management
- Cumulative Responsibility
- Write-off policy of Books
- Personal grooming activities like meditations, exercise etc.
- Sufficient staff to manage the patrons
- Yoga & Meditation

So the library managing authority should make necessary arrangement of the above stress manageable methods in their concerned college libraries.

5. Other Suggestions for reducing Stress

Library professionals of the concerned collages libraries suggested the following additional suggestions for managing the stress among library professionals:

- Library professionals should be having positive attitude toward their work and responsibilities.
- Library staff should have the habit of hard working.
- A good discipline may reduce the stress among library professionals as suggested by library professionals.
- Good policies of libraries may reduce stress among library professionals.
- Library Software should be user friendly for students as well as for library personnel.
- Library should have its separate building.
- There should be online reference services to facilitate users in concerned libraries.
- All library facilities for users (computer, internet access, online access of resources etc.) may reduce stress as these will satisfy all uses of library.

6. Conclusion:

The study reveals that although the library professionals working in concerned colleges libraries have stress at their working place but this stress is not so critical and may be manage by easily by provided methods and suggestions. Authority of libraries should make clear cut policy for write-off of books, should arrange training and development program for library personnel, should facilitate library with modern facilities, ICT infrastructure and e-resources. Rewards/awards and time to promotion also reduce the stress and authorities should organize conference/seminar on this topic and there should be medical checkup of the

library professionals. It is also reveal here that stress level in library professional in Haryana is not as much in comparison library professionals in State University Libraries of UP (a study of stress level is conducted by the author in 2013 in UP)[5]



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5 Mange Ram (Jan-June 2013). The Stress and its Management in Professionals of the State University Libraries of Uttar Pradesh: A Study" in Journal of Library and Information Communication Technology, Vol 2, No 1, ISSN No -2278-3482, P 45-53

AWARENESS OF ELECTRONIC INFORMATION SERVICES IN PG STUDENTS AND FACULTY MEMBERS

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Abstract: This Study Deals with Awareness of Electronic Information Services in PG Students and Faculty Members The researcher has employed a well-structured questionnaire for collecting the data from PG students, Research Scholars and Faculty members of 10 colleges in Bharathiar University. ICT based resources and services are resources in which information is stored electronically and which are accessible through electronic systems and networks.

Keywords: E-Resources1; E-Services2; Information and Communication Technology3; Arts and Science Colleges4.

1. INTRODUCTION

Electronic Resources are becoming very important these days as they are more up-to-date, and can be accessed anywhere, crossing all geographical boundaries. Such resources add value while conducting R&D activities. The concept of digital library, virtual library, and electronic library came into present situation. In the recent years, libraries have witnessed a great metamorphosis both in the collection development and the service structure. The availability of CD-ROM, DVD-ROM, and other online resources of bibliographical and full – text databases is quite common in the majority of the university and college libraries. The libraries have an option to subscribe to these full – text databases as part of their digital collections.

2. LITERATURE REVIEW

Ahmad and Fatima (2009) identified that researcher are not getting proper training/ guidance and assistance from the staffs/ libraries, which is very necessary for the effective use of ICT products and services. The library should arrange and organise training programmes related to ICT. Library should provide initial orientation workshops and training for the researchers on ICT based services so

that they can utilize these technologies to optimum level. Yusuf and Nkiko (2010) revealed that application of Information Communication Technology in organising library materials has in turn changed the role of cataloguers from merely providing bibliographic details of materials to that of supervision and other administrative functions, and in order to maintain relevance, librarians have been forced to build capacity in the area of Information Communication Technology. Sampath Kumar and Biradar (2010) found the lack of budget, manpower, skilled staff, and training are the main constraints for not automating library activities. Even though library professionals have shown a positive attitude towards the use of ICT applications and library automation, they need extensive and appropriate training to make use of ICT tools

3. OBJECTIVES OF THE STUDY

The Objectives of the study are:

- To find out the frequency library visit for accessing ICT based resources and services among the users of Arts and Science Colleges affiliated to Bharathiar University in Coimbatore.
- To analyze the awareness of ICT based resources and services among the users
- To determine the most preferred Search Engine of Respondent's
- To determine the most commonly used Browser of Respondent's
- To determine the users level of satisfaction with the ICT based resources and services.

4. SAMPLING

There are 72 Arts and Science colleges, affiliated to Bharathiar University Coimbatore Out of them; researcher has selected only 10 colleges on the basis of year of establishment. The researcher has employed a well-structured questionnaire for collecting the data from PG students, Research Scholars and Faculty members of 10 colleges in Bharathiar University. A total number of 1600 questionnaires were distributed among the PG students, Research Scholars and Faculty members. Only 1561 out of 1600 respondents among whom the questionnaires were distributed. This constitutes 97.56% (1561/1600) of the total response.

5. DATA ANALYSIS

The collected data were classified and tabulated according to the objectives and hypothesis stated. For proper arrangement of the data, a master table was prepared by the author. The general data interpretation was made with the help of percentages and averages.

6. ANALYSIS AND INTERPRETATION

Table 1 Academic Status Wise Distribution Of Respondent's Frequency Of Library Visit.

Academic status	Frequency of Library visit					Total
	Daily	Twice in a week	Once in a week	Once in a month	Occasionally	
PG Students	407 (53.13)	212 (27.68)	68 (8.88)	27 (3.52)	52 (6.79)	766
Research scholars	101 (38.11)	72 (27.17)	31 (11.70)	25 (9.43)	36 (13.58)	265
Faculty Members	210 (39.62)	121 (22.83)	94 (17.74)	59 (11.13)	46 (8.68)	530
Total	718 (46.00)	405 (25.94)	193 (12.36)	111 (7.11)	134 (8.58)	1561

(Figures in Parentheses denote Percentage)

Data presented in table 1 indicates the academic status-wise distribution of respondent's frequency of visit to the library. It could be noted that out of the total 1561 respondents, 718(46.00%) respondents visited the library daily; 405 (25.94%) respondents visited the library twice in a week; 193(12.36%) respondents visited the library once in a week; 111(7.11%) respondents visited the library once in a month and 134(8.58%) respondents visited the library occasionally. Among 766 PG students, 53.13 percent respondents visited the library daily and 3.52 percent respondents visited the library monthly. With regard to 265 Research scholars, 38.11 percent of respondents visited the library daily and 9.43 percent of respondents visited the library monthly. Out of 530 Faculty members, 39.62 percent of respondents visited the library daily and 8.68 percent of respondents visited the library occasionally.

TABLE - 2 ACADEMIC STATUS WISE DISTRIBUTION OF RESPONDENT'S AWARENESS OF ICT BASED RESOURCES AND SERVICES

Academic status	Very Good	Good	Poor	Total
PG Students	504 (65.80)	214 (27.94)	48 (6.27)	766
Research scholars	118 (44.53)	102 (38.49)	45 (16.98)	265
Faculty Members	336 (63.40)	166 (31.32)	28 (5.28)	530
Total	958 (61.37)	482 (30.88)	121 (7.75)	1561

(Figures in Parentheses denote Percentage)

Data presented in table 2 exhibits the academic status-wise distribution of respondents' awareness of ICT based resources and services. Out of 1561 total respondents, 958(61.37%) respondents have very good awareness of the use of ICT based resources and services, 482(30.88%) respondents have good awareness of the use of ICT based resources and services and 121(7.75%) respondents have poor awareness of the use of ICT based resources and services. With regard to 766 PG students, 65.80 percent of respondents have very good awareness of the use of ICT based resources and services and 6.67 percent of respondents have poor awareness of the use of ICT based resources and services. Among 265 Research Scholars, 44.53 percent of respondents have very good awareness of the use of ICT based resources and services and 16.98 percent of respondents have poor awareness of the use of ICT based resources and services. From the total of 530 Faculty Members, 63.40 percent of respondents have very good awareness and 5.28 percent of the faculty members have poor awareness of the use of ICT based resources and services.

TABLE 3 ACADEMIC STATUS WISE DISTRIBUTION OF RESPONDENT'S TYPES OF CD-ROM RESOURCES USED

Academic status	Reference Books CD	Indexing and Abstracting CD	Full text Journal CD	Electronic Book CD	Statistics like census report	Music and Film CD	Any Other	Total
PG Students	130 (16.97)	191 (24.93)	181 (23.63)	62 (8.09)	57 (7.44)	77 (10.05)	68 (8.88)	766
Research scholars	45 (16.98)	45 (16.98)	48 (18.11)	22 (8.30)	45 (16.98)	15 (5.66)	45 (16.98)	265

Faculty Members	121 (22.83)	97 (18.30)	107 (20.19)	110 (20.75)	57 (10.75)	21 (3.96)	17 (3.21)	530
Total	296 (18.96)	333 (21.33)	336 (21.52)	194 (12.43)	159 (10.19)	113 (7.24)	130 (8.33)	1561

(Figures in Parentheses denote Percentage)

Table 3 shows the academic status wise distribution of respondents' types of CD ROM resources used. In order to analyze the types of CD ROM resources used, the CD Rom resources were classified in the seven categories as shown in the table. Full text journal (21.52%) were the most used items followed by indexing and abstracting (21.33%), CD version of Statistics like census report (10.19%), CD of Reference Books (18.96%), Electronic Books in CD form (12.43%),Any other CD (8.33%), Music and Film CD (7.24%).Among 766 PG students, 24.93 percent of the respondents have used Indexing and Abstracting CDs and 7.44 percent of the respondents have used CD version of statistics like census report. With regard to 265 Research Scholars, 16.98 percent of the respondents have used Indexing and Abstracting CD; and 5.66 percent of the respondents have used Music and Films. Out of 530 Faculty members, 22.83 percent of the respondents have used CDs of reference books and 3.96 percent of the respondents have used Music and Film CDs.

TABLE 4 ACADEMIC STATUS WISE DISTRIBUTION OF RESPONDENT'S VIEWS ON MOST PREFERRED SEARCH ENGINE

Academic status	Search Engines								Total
	Google	Excite	Info seek	Lycos	Alta Vista	MSN	Yahoo	Ask.com	
PG Students	340 (44.39)	30 (3.92)	12 (1.57)	21 (2.74)	36 (4.70)	39 (5.09)	208 (27.05)	80 (10.44)	766
Research scholars	90 (33.96)	15 (5.66)	11 (4.15)	19 (7.17)	26 (9.81)	29 (1.94)	52 (19.62)	23 (8.68)	265
Faculty Members	169 (31.89)	35 (6.60)	19 (3.58)	36 (6.79)	33 (6.23)	70 (13.21)	111 (20.94)	57 (10.75)	530
Total	599 (38.37)	80 (5.12)	42 (2.69)	76 (4.87)	95 (6.09)	138 (8.84)	371 (23.77)	160 (10.25)	1561

(Figures in Parentheses denote Percentage)

Table 4 shows the academic status-wise distribution of respondents' Views on search engine used. It could be noted that out of the total 1561 respondents, 599(38.37%) respondents have used Google Search Engine; 371(23.77%) respondents have used Yahoo Search Engine; 160(10.25%) respondents have

used Ask.Com; 76(4.87%) respondents have used Lycos; 80(5.12%) respondents have used Excite; 42(2.69%) respondents have used Info seek; 138(8.84%) respondents have used MSN and 95(6.09%) respondents have used Alta Vista. With regard to 766 PG Students, 44.39 percent of them have used Google and 1.57 percent of them have used Info seek search engine. Among 265 Research Scholars, 33.96 percent of them have used Google search engines and 1.94 percent of them have used MSN search engine. Out of 530 Faculty Members, 31.89 percent of them have used Google search engine and 3.58 percent of them have used Info seek search engine

TABLE 5 ACADEMIC STATUS WISE DISTRIBUTION OF RESPONDENTS' MOST COMMONLY USED BROWSER

Academic status	Bowsers			Total
	Internet Explorer	Opera	Mozilla fire fox	
PG students	421 (54.96)	278 (36.29)	27 (3.52)	766
Research scholars	181 (68.30)	72 (27.17)	12 (4.53)	265
Faculty members	394 (74.34)	105 (19.81)	31 (5.85)	531
Total	996 (63.81)	455 (29.15)	70 (4.48)	1561

(Figures in Parentheses denote Percentage)

Table 5 shows the academic status wise distribution of respondent's most commonly used browser. It could be noted that out of the total number of 1561 respondents, 996(63.81%) respondents used Internet Explorer; 445(29.15%) of them use Opera and 70 (4.48%) of them use Mozilla fire fox. It is clear that from 766 P.G students respondent's, 421(54.96%) respondents use Internet Explorer, 278(36.29%) respondents use opera and 27(3.52%) respondent's use Mozilla fire fox. Out of 265 Research scholars respondents, 181(68.30%) respondents use Internet Explorer, 72(27.17%) respondents use opera and 12(4.53%) respondent's use Mozilla fire fox. Among 530 Faculty members respondent's, 394(74.34%) respondent's use Internet Explorer; 105(19.81%) respondents use opera and 31(5.85%) respondents use Mozilla fire fox. It is clear from the above discussions that, more than 74.34 percent of faculty member respondent's use Internet Explorer followed by Research scholar's respondent's (68.30%) and P.G students respondent's (54.96%).

Figure 1 Academic status wise Distribution of Respondents' Who commonly used Browser

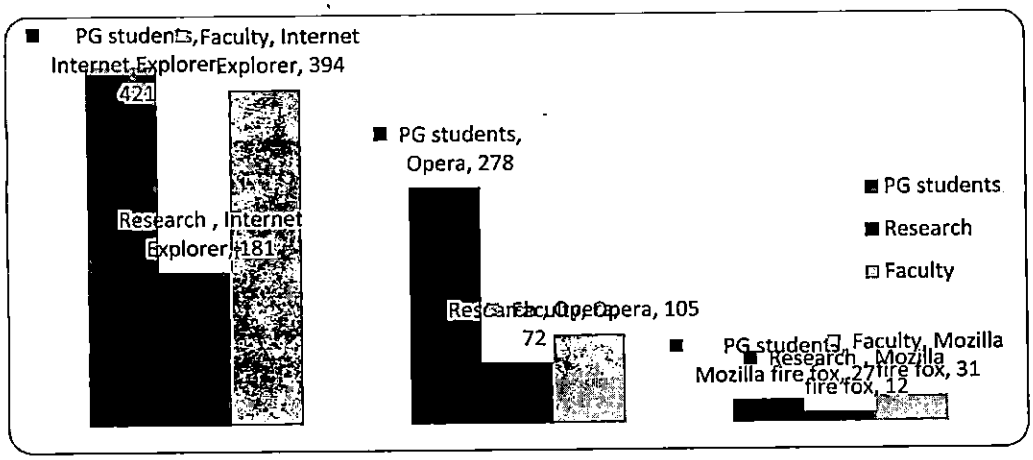


TABLE 6ACADEMIC STATUS WISE DISTRIBUTION OF RESPONDENT'S INFORMATION NEEDS FULFILLED THROUGH ICT BASED RESOURCES AND SERVICES

Academic status	Less than 10%	11-25%	26-50%	51-75%	More than 75%	Total
PG Students	59 (7.70)	69 (9.01)	159 (20.76)	221 (28.85)	258 (33.68)	766
Research scholars	26 (9.81)	33 (12.45)	58 (21.89)	56 (21.13)	92 (34.72)	265
Faculty Members	21 (3.96)	58 (10.94)	113 (21.32)	145 (27.36)	193 (36.42)	530
Total	106 (6.79)	160 (10.25)	330 (21.14)	422 (21.03)	543 (34.79)	1561

(Figures in Parentheses denote Percentage)

Data presented in table 6 indicates the academic status wise distribution of respondents information needs fulfilled through ICT based resources and services. It could be noted that out of the total 1561 respondents, 106(6.79%) respondents fulfilled less than 10% of their information needs through ICT based resources and services; 160(10.25%) respondents fulfilled 11.25% of their information needs through ICT based resources and services; 330(21.14%) respondents 26.50% of their information needs through ICT based resources and services; 422(21.03%) respondents fulfilled 51.75% of their information needs through ICT based resources and services and

543(34.79%) respondents fulfilled more than 75% of their information needs through ICT based resources and services. With regard to 766 PG Student, 33.68 percent of the respondents fulfilled more than 75% of information needs through the ICT based resources and services and 7.70 percent of the respondents fulfilled less than 10% of their information needs through the ICT based resources and services. Among 265 Research scholars, 34.72 percent of the respondents fulfilled more than 75% of their information needs through ICT based resources and services, and 9.81 percent of the respondents fulfilled less than 10% of their information needs through ICT based resources and services. Out of 530 faculty members, 36.42 percent of the respondents fulfilled more than 75% of their information needs through ICT based resources and services and 3.96 percent of the respondents fulfilled less than 10% of their information needs through ICT based resources and services.

TABLE 7 ACADEMIC STATUS WISE DISTRIBUTION OF RESPONDENT'S EXPERIENCE IN USING ICT BASED RESOURCES AND SERVICES

Academic status	Less than one year	One Year	Two years	Three Years	More than three Years	Total
PG Students	85 (11.10)	153 (19.97)	304 (39.69)	155 (20.23)	69 (9.01)	766
Research scholars	36 (13.58)	51 (19.25)	90 (33.96)	62 (23.40)	26 (9.81)	265
Faculty Members	23 (4.34)	132 (24.91)	201 (37.92)	66 (12.45)	108 (20.38)	530
Total	144 (9.22)	336 (21.52)	595 (38.12)	283 (18.13)	203 (13.00)	1561

(Figures in Parentheses denote Percentage)

Data presented in table 7 indicates the academic status-wise distribution of respondents' experience in using ICT based resources and services. It could be noted that out of total 1561 respondents, 144(9.22%) respondents have been accessing ICT based resources and services for Less than one year; 336(21.52%) respondents have been accessing ICT based resources and services for One year; 595(38.12%) respondents have been accessing ICT based resources and services for two years; 283(18.13%) respondents have been accessing ICT based resources and services for three years and 203(13.00%) respondents have been accessing ICT based resources and services for more than three years. With regard to 766 PG students, 39.69 percent of respondents have been accessing ICT based resources and services for two years and 9.01 percent of respondents have been accessing ICT based resources and services for more than three years. Among 265 Research Scholars, 33.96 percent of respondents have been accessing ICT based resources

and services for two years and 9.81 percent of respondents have been accessing ICT based resources and services for more than three years. From the total number of 530 Faculty Members, 37.92 percent of respondents have been accessing ICT based resources and services for two years and 4.34 percent of respondents have been accessing ICT based resources and services for less than one year.

TABLE 8 ACADEMIC STATUS WISE DISTRIBUTION OF RESPONDENT'S SATISFACTION LEVEL OF ICT BASED RESOURCES AND SERVICES

Academic status	Level of Satisfaction				Total
	Highly satisfied	Satisfied	Somewhat satisfied	Dissatisfied	
PG students	105 (13.71)	248 (32.38)	361 (47.13)	52 (61.79)	766
Research Scholars	52 (19.62)	71 (26.79)	115 (43.40)	27 (10.19)	265
Faculty members	98 (18.49)	183 (34.53)	212 (40.00)	37 (6.98)	530
Total	255 (16.34)	502 (32.16)	688 (44.07)	116 (7.43)	1561

(Figures in Parentheses denote Percentage)

Figure 2. Academic status wise Distribution of Respondent's Satisfaction level of ICT based resources and services

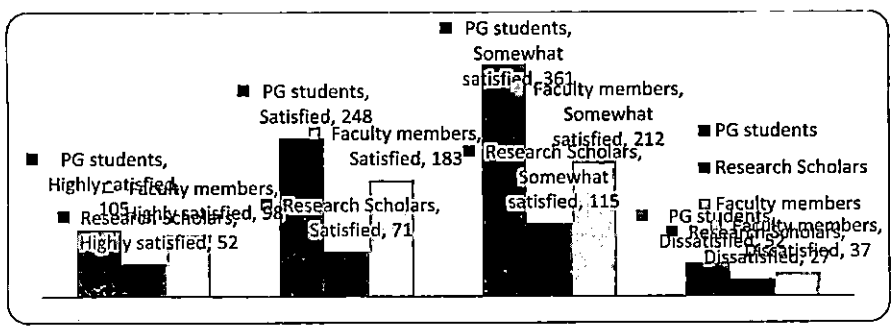


Table 8 shows the academic status wise distribution of respondent's satisfaction level of ICT based resources and services. It could be noted that out of 1561 respondents, 255(16.34%) respondents are highly satisfied; 502(32.16%) respondents are satisfied; 688(44.07%) respondents are somewhat satisfied and 116(7.43%) respondents are dissatisfied. Among the total number of 766

PG students, 32.38 percent of them are satisfied and 6.79 percent of them are dissatisfied. Out of 265 Research scholars, 43.40 percent of them somewhat satisfied and 10.19 percent of them are dissatisfied. With regard to 530 faculty members, 40.00 percent of them somewhat satisfied and 6.98 percent of them are dissatisfied. Hence it can be concluded that most of the respondents are somewhat satisfied.

7. FINDINGS AND CONCLUSION

The findings of the distribution of respondent's Awareness of ICT based resources and services reveal the fact that, 61.37 percent of the respondents have very good awareness of the use of ICT based resources and services. The findings of the academic status-wise distribution of respondent's awareness of ICT based resources and services reveal the fact that, 65.80 percent of PG students have very good awareness of the use of ICT based resources and services, 44.53 percent of Research Scholars have very good awareness of the use of ICT based resources and services and 63.40 percent of Faculty members have good awareness of the use of ICT based resources and services. The findings of the distribution of respondents' views on search engines used reveal the fact that, 38.37 percent respondents have used Google Search Engine. The findings of the academic status-wise distribution of respondents' views on search engines used reveal that, 44.39 percent of PG students; 33.96 percent of Research scholars and 31.89 percent of Faculty members have used Google search engine. The findings of the distribution of respondent's satisfaction level of ICT based resources reveal the fact that, 255 (16.34%) respondents are highly satisfied; 502(32.16%) respondents are satisfied; 688(44.07%) respondents are somewhat satisfied and 116(07.43%) respondents are dissatisfied.

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Authors Profile



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CALIBRE: E-BOOK MANAGEMENT SYSTEM

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Abstract: In this era of Information explosion, various technologies have been employed by the library and information centers to carry out various activities of the library. ICT has made a great impact on library activities. Technologies like library automation, digitization, Internet, WWW, Social networking tools helped the libraries and librarians in improving information storage and services. E-Resources are the products of digitization. E-resources include E-books, e-journals, e-newspapers, e-pamphlets, e-thesis and dissertations etc. librarians need to have knowledge of Electronic Resource Management. Calibre is open source software used for managing E- Books. This paper describes E-books, Management of e-books, Calibre and its applications in Digital Libraries.

Keywords: Digital Library, E-Book, Calibre,

1. I INTRODUCTION

The technological innovations have changed the way libraries are working. The instantaneous access of Information through the internet has made vast amounts of digital Information and Data available to anyone with a computer, a modem and a service provider. This has enabled the information users to access, retrieve and use information more effectively and efficiently. The information which is digital in nature is changing the role of libraries as a facilitator for providing access to digital or Electronic resources like E-Books and E-Journals. The availability of Information in digitized form has given birth to DIGITAL LIBRARIES. Digital library is a collection of documents in organized form available on the Internet or on CD-ROMS. The digital content may be stored locally, or accessed remotely via

computer networks. According Larsen "Digital library is a global virtual library the library of thousands of networked electronic libraries." Digital library includes electronic resources like E-Books and E-Journals. E-Resource is an electronic information resource that can be accessed on the web on or off campus. It contains Electronic files, web pages, E-books, E-journals Databases, E-Newspapers, E-Thesis and Dissertations, CD ROM Databases, Search engines, library networks/ Portals, Digital archives, webinars etc. Digital Libraries require ICT infrastructure to be able to serve its users. For establishing Digital libraries, libraries need to have digital content management software, server scanners, storage devices, Internet, networking, workstations etc. There are many Digital library softwares available in the library. Some of them are freely available and some are paid. Drupal, Dspace, Greenstone, Jhoomla, E-Print, MyCoRe, Endeavor's ENCompass for digital collections, ExLibris'DigiTool, Innovative's metasource VTLS'VITAL and other softwares for managing Electronic Resources in the digital library. In any given library Books & Journals are the core collection of its collection. Same is the case with Digital libraries too.

E-Book: According to Bacchav, N advent in ICT two decades ago the printed book format was changed and electronic format of book took place. E-book concept was first time mentioned by Vannevar Bush in 1945. Later in 1971, Michael Hart, under the project Gutenberg created the first digital book entitled "US Declaration of Independence" was published on Internet. Since then E-Books have received wide attention across the world. E-Book refers to a book that is available in electronic format. It cannot be held in the hand like a real book. It can only be read on the computer or any other device which is used as a reader.

Oxford Dictionary defines E-Books "as a book that is displayed on a computer screen or on an electronic device that is held in the hand instead of being printed on paper."

Armstrong et al (2002) defines E-Book as "Any piece of electronic text regardless of size or composition (a digital object), but excluding journal publications, made available electronically (or optically) for any device (handheld or desk-bound) that includes a screen."

E-Book collection in the library has many advantages since there is no need for physical space and shelving and re-shelving of the books. At a time multiple users can use the same book. If the books are made available through the library portal, users can access at their convenient time and place. Many applications have been created to manage the different E-Resources like music, images and documents online or on one's PC. People usually store the E-Books in files on their computer

or storage devices. Even a mobile phone or E-Book Reader can carry thousands of E-Books in his pocket. E-Book readers allow reading not only on computers but also on mobile phones and tablets. E-Books are available in different formats like .txt, .pdf, .doc, docx, .jpg, .jgif, .tiff, png, avi, .wav, .mp3 .html etc.

There are different types of E-Books like

- Downloadable e-Books
- Dedicated e-Books
- Web accessible e-Books
- Print on demand e-Books

E-books have more advantages than the printed books like they reach the reader community faster than the print books. They can be easily updated and upgraded. They require less space. They are portable. They can shoe links. They are searchable etc.

Though the e-books have advantages over printed books, they have posed challenges for the librarians for the development of e-books collection in the library. Some of the challenges are

- Acquisition and Collection development: These challenges are regarding budget
- allocations, usage and distribution models, purchase models and collection development policy for e-books
- Standard and technology: These challenges are regarding cataloguing and metadata
- standards and schemes, hardware and software technologies, digital rights management software and user and staff training.
- Access Challenges: It includes the cataloguing and indexing of e-books. Circulation models for the electronic environment, and preservation and archiving of e-books and the resources linked to them.

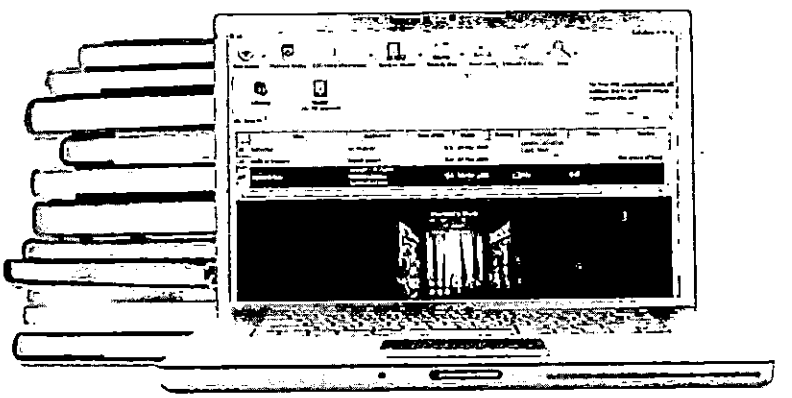
In order to overcome the challenges posed for E-books acquisition, storage and access many companies like Apple, Amazon, Sony, Nook have come up with many E-Book reader devices and many have introduced their own file formats. Availability of E-Books in large form and different formats has made the management of collection of E-Books in the libraries and for the librarians a challenging task. Storing and retrieving is not an easy job. Many E-books can be downloaded in different formats from the Internet. But all the E-Book Reader may not support

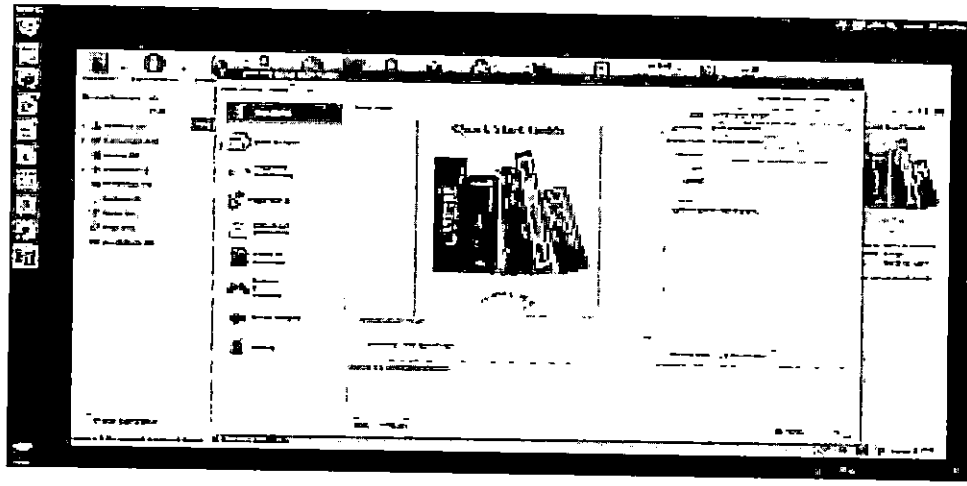
them. An application or software is required to maintain such collection. There are some softwares available for the purpose. Some of them are eBook Library Software, KooBits, Blio, Alpha eBooks Manager, All My Books, Calibre, GutenPy. CALIBRE is one such freely available E-Book Management software.

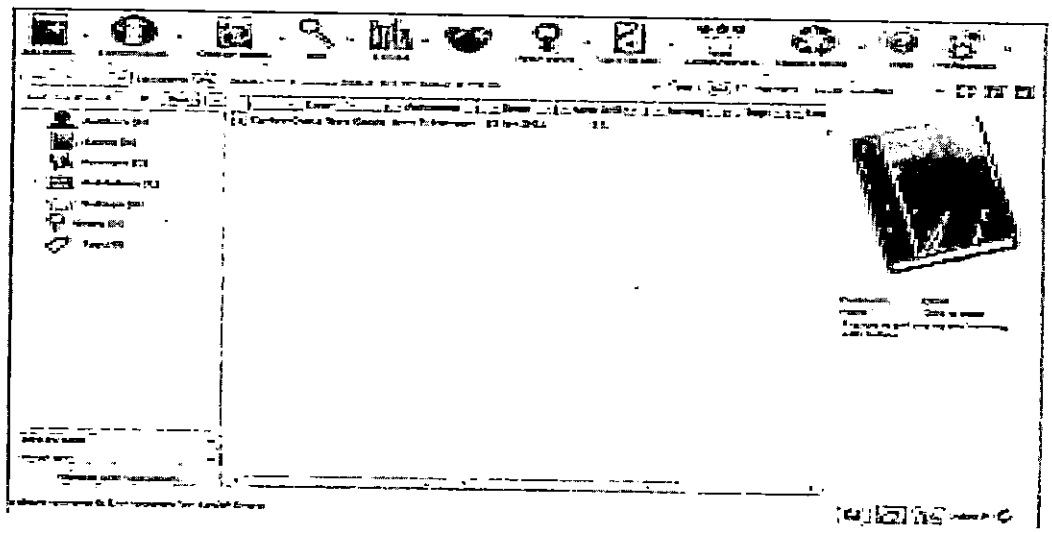
2. CALIBRE

- **HISTORY:** Calibre is a free and open source e-book library management application developed for users of e-books. This was developed by Kovid Goyal in the year . Earlier it was called libprs500. Main objective was to enable use of the PRS 500 on Linux. In 2008, it was named as Calibre. According to the developer Kovid Goyal The libre in Calibre stands for freedom, indicating that Calibre is a free and open source product, modifiable by all.
- **MEANING** : CALIBRE in English means QUALITY
- SNAPSHOTS OF CALIBRE









3. FEATURES OF CALIBRE ARE

1) Calibre is a free and open source software for managing E-Books Collection.
2) It runs on multiple platforms
3) It can be downloaded on operating softwares like Windows, Linux, Android
4) It can be used on PCs, Mobile phones , Tablets
5) It allows user to manage E- Book collection, create, edit and read
6) It supports many file formats and e-book devices

7) E-Book formats can be edited by changing Fonts, font size etc

8) It allows users to sort and group e-books using metadata

9) It allows searching using different fields like author, title, ISBN, publisher etc.

10) E-books can be imported either manually uploading or syncing the E-book reading device.

11) E-Book can be exported to all the supporting E-Book reader devices.

12) The content of the library can be accessed a web browser, network

13) It has bug fixing facility

4. CALIBRE IN DIGITAL LIBRARY ENVIRONMENT

Adding Books to the Collection: Adding books to the collection is simple and can be added by simply dragging the items to the CALIBRE WINDOW. By clicking the add book icon from the main window and selecting the required option from the pop up list multiple books or different formats of the same book can be added to the existing collection. Calibre manages its collection using e-book metadata. It has built in features like Web Server; Email Server, Metadata harvesting and the control over Metadata qualifiers. It is free from Digital Rights Management

1 As a Library Management

Calibre manages e-book collection

It sorts the books in the collection

It supports the searching using Author, Title, publisher, date added,

It also supports extra searchable metadata like Tags & Comments.

It searches for book metadata based on the existing title, author or ISBN

It can download metadata and cover for the books.

2) As a E- Book Conversion platform

Calibre can convert book in one format to another format.

It supports all the major e-book formats.

It can rescale the font size

It can detect or create book structure like Chapters and Table of contents.

It can insert the Metadata.

3) As a Syncing

It has a modular device driver design that makes adding support for different e-reader device easy.

Syncing supports updating metadata on the device from metadata in the library.

Caliber chooses the most suitable format while uploading to the device in case a book has a more than one format available.

4) Downloading News from the web and converting it into E-Book Form

Caliber can fetch news from websites or RSS Feeds, format the News into a eBook and upload to a connected device. It has over 300 News Sources and the news system is plug-in based allowing users to easily create and contribute new sources to caliber.

5) It is A COMPREHENSIVE e-BOOK VIEWER

Calibre has a built in ebook viewer that can display all the major e-Book formats. It supports for TOC, Bookmarks, CSS, printing, searching, copying etc.

6) CONTENT SERVER FOR ONLINE ACCESS

Caliber has a built in web server that allows to access the E-book collection using a simple browser from any computer anywhere in the world.

Users can access e-books of the library through the Local Area Network. of an institution or through the internet.

Same book can be provided in different common formats like epub, pdf, html and text.

Web interface allows the users to search the book on the basic search using title, author, publisher of an E-Book

7) E-BOOK EDITOR FOR THE MAJOR E-BOOK FORMATS

Caliber has built in editor which allows to edit E-books. It has a live preview showing the effects of the changes. It also has an integrated review tool

8) **E-Book can be shared by E-Mail.**

Caliber has the inbuilt support for Gmail & Hotmail email services. Email server of the institution or general E-mail accounts can be used for sharing the E-Book by Emil.

9) Cover browser allow customizing the Text that appears under the covers with a template in preference.

10) While sending E-Book without a cover to the device, Calibre generates a cover book metadata instead of using the Blank Book Icon.

11) It provides Table of Content facility

5. LIMITATIONS

It doesn't support full text search of the e-book.

Metadata standards like MARC, Dublin Core are not supported.

Conversion and editing are easily applied to appropriately licensed digital books, but commercially purchased e-books may need to have digital rights management (DRM) restrictions removed

6. CONCLUSION

In today's world of Inventions and innovations clubbed with Information explosion, libraries especially academic libraries are expected to provide their services to their clientele in various modes. Information needs of the users are different and are expected in various formats may be in print or non print form like e-resources. Collection, maintenance and access, retrieving of E-RESOURCES has given birth to Digital library. Maintenance of Digital library needs ICT environment and expertise on the part of the librarians. Huge investment is required. Most of the libraries cannot afford to it. In order to overcome this problem OPEN ACCESS SOFTWARE MOVEMENT has been started. Linux is one such software. Even in Library & Information science field many softwares have been developed by the experts. Some of them are Koha, E Granthalaya as a Library Management software for Library Automation, Dspace, Greenstone, Fedora, E-prints for digital libraries, Drupal as a content Management software. Calibre is afree software for E-Book management, which provides many benefits of creation, editing, import of e-books, export of e-books, convertion of e-books in the digital environment. Since it is free and open source software and can be downloaded on any Operating

Systems academic libraries by installing this software can become more efficient and effective service providers of information in variety of Formats.

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Digital Humanities – *Concepts, tools and applications*

Prof. A.Y.Asundi[1]

Abstract: Digital humanities is a result of convergence of digital technology with social sciences and humanities. It is now one of the key research areas around the world in humanities and social sciences and library and information science and other related subjects, like art and archeology.. Focus groups in the form of Digital Humanities Centres are created for intensive research and these centres are mainly located in libraries and use library infrastructure in their core programmes. The library professionals would collaborate in knowledge organization, knowledge management, search and retrieval design and education and training and contribute in the areas such as; metadata, semantic mapping, ontology, thesaurus construction, data management, discovery services and so on. There is also growing collaboration between different departments of universities on this subject. India is now reckoned as one of the technologically advanced countries particularly in the IT sector. Recognising the socio-cultural legacy and diverse historical background it can be viewed that digital humanities has many opportunities and applications for India and to which LIS professionals can contribute substantially. This paper tries to bring together the concepts, tools and applications of digital humanities and also propose a course of study in the LIS curriculum.

Keywords: Digital Humanities, Library and Information Science, Humanities, Social Sciences

1. Introduction:

The new millennium has sculptured a new image for library and information science profession due to application of information and communication technology (ICT), especially the digital technology. The field that has carved-out some unique techniques and tools for information and knowledge organization and management, has always been innovative and inventing new areas of study with the tremendous insight gained with the application of ICT by new products, services and operations and management. Some new areas that have emerged and receiving tremendous acceptance in the last one decade or so are; information commons/library commons, discovery service, research data management, Semantic Web, open access to scholarly information including digital curation and digital humanities. The way digital technology is focused on e-science has now ushered in a lasting interest among the humanists and social scientists to look for the computational applications. In this paper an attempt is made to present and map the concepts and tools and

[1]Professor and Chairman (Ret.), Department of Library and Information Science, and

Officer-in-charge, IT Centre, Bangalore University, Bangalore.ashokasundi@ rediffmail.com areas of application of digital humanities and exemplify its potentialities as a subject of study in library and information science and visualize its potentiality as one of the new research areas and opportunity, in collaborating with other cognate subjects. Some of the subjects in which digital humanities finds applications are; Archeology, Epigraphy, Archives, Museums and Art Galleries and in Literature and Linguistics, and Religion and Philosophy and many more. Babeu (2011) has explored the classical studies and projects over the past 40 years in the subjects listed above. In further narrowing the areas of application the author states " within this historical compass the sources for classicists are equally complex; stone fragments, papyri, pottery shards, the plastic art, coins and some of the most breathtaking physical structure the world has known" Since the LIS professionals deal with the universe of knowledge and its organizational components so they can contribute to digital humanities in the areas of knowledge organization and management, metadata, data management and analysis, lexicology, concordance development and the analysis of national bibliographies and so on. In fact Havermann et al (2012) contextually emphasize that metadata for the cultural objects is one of the very important area as it is required for precise information retrieval. They further state that a digitized cultural heritage object, like a 3D-model of a vase, is useless without additional information for documentation and retrieval purposes, the so called metadata. The paper attempts to build a case for the study of digital humanities for Library and Information Science professionals, projecting its concepts, tools and areas of applications.

2. Meaning and Definition of Digital Humanities:

According to the Association of Research Libraries (ARL)' " Digital Humanities is an emerging field which employs computer based technologies with the aim of exploring new areas of enquiry in humanities".(ARL, 2011) There are number of digital humanities centres in universities doing project in the subject such as "George Mason University, Centre for History and New Media". The centres are normally located in the libraries and involve library staff or services in their core programs. The ARL has conducted a survey of digital scholarship centres (alternative to digital humanities centres) or services and support humanities subjects such as; history, Arts, Music, Films, Literature, Philosophy, Religion etc. The Stanford University Libraries are engaged in the analysis of e-mail archives

using a software package ePADD developed for this purpose. (

3. Conceptulisation of Digital Humanities:

ICT and Humanists:

A decade or so ago the humanists and social scientists had avoided using any computing devise, as did find it has any beneficial application in their study and research. The special issue of Library Trends on Electronic Information for the humanities contained several papers in which the authors view humanists' aversion to use computers in research(Library Trends, 1992). Stover addresses this resentment by humanists in using computers thus; " till 1990s there was a comment that humanists regularly received "bad press" from the conventional wisdom of electronic information. Humanists it is said are resistant to the idea of using computers for research. Another important and critical factor to be considered here is that "the humanists need considerable amounts of older material, a need very different from most other science disciplines" (Stover, 1992)

Concept of One Culture:

The digital humanities have brought to realization from two cultures to one culture. After the industrial revolution the society visualized two distinct cultures comprising: humanists and scientists – two distinct intellectual communities. These two communities did not interact across their disciplinary boundaries and, for all the similarities in intellects, background and social standing, lived and worked in the worlds of their own for long time. Interestingly, one of the topics that Snow chose to highlight in his description of the divergent worldviews of the "two cultures" was on the industrial revolution. He emphasized the revolution was largely product of science and engineering, and also claimed that writers and humanists had largely ignored it. The crux of the observation is an assumption that science embraces technology and the humanities does not, or does so more slowly and reluctantly. Such assumptions are no longer valid, as number of projects shows the success of shared intellectual values, rigorous methodological approaches, and common ground across scientific and humanistic disciplines. Researchers from these disciplines rely deeply upon one another for insight and discovery when confronted with very large scale complex challenges. So there is a need for amalgamation of e-science with digital humanities to create one culture of e-research, that involves not a choice between the scientific and humanities visions of the world, but an imperative that people and organizations fully embrace

both.

Digital Classics:

Digital Classics is broadly defined as the use of digital technologies in any field related to the study of classical antiquity. The field of classical studies is broad and includes a variety of related disciplines and Babeu (2011) reports the studies on the following subjects worldwide.

1. Ancient History – areas like, inscriptions, papyri and coins etc.
2. Classical Archaeology –
3. Classical Art and Architecture – Ancient theatre and Archives
4. Classical Geography
5. Epigraphy – Study of inscriptions – Projects – EpiDoc
6. Manuscripts Studies
7. Numismatics – study and collection of coins
8. Palaeography – Complementary to Philology
9. Papyrology – Study of ancient literature and legal archives on paparyi
10. Philology – Ancient languages, their grammar, history and the phonetics
11. Prosopography – Description of a person, or a collection of such descriptions especially in a historical context. The study of personal names "to establish i) regional origins of individuals and ii) Family connections

Besides the above subjects, there are also number of multidisciplinary projects have been completed and available online (Babeu, 2011)

1. Electronic Text Corpus of Sumarian literature
2. Cuneiform Digital Palaeography
3. Digital Hammurabi Project
4. Sanskrit Library
5. Cuneiform Digital Library Initiatives
6. Lauven Database of Ancient Books

Digital Humanities Projects USA:

This report results from a study of eight institutional projects that have uncovered previously unimagined correlation between social and historical phenomena through computational analysis of large, complex data sets.

Here below given some examples of digital humanities projects underway.

1. Rice University digital scholarship archive
- http://scholarship.rice.edu/
2. Columbia University: Digital humanities Centre Brochure\
- www.columbia.edu/library/dhc
3. Cornell University Grants program for digital collection in Arts and sciences
4. University of Kansas: Seed Grants Institute of Digital Research for Humanities
- http://idrh.ku.edu/seedgrants
5. University of Massachusetts Amherst-Digital Humanities Grants
- http://www.umass.edu/hfa/grants/hfafunding/frs/digitalhumanities.html

4. Digital Humanities in India:

According to Diwan (2016) "though digital humanities has become a buzz word in developed countries, the field is in its nascent stage in India. The 'archiving moment' the country is going through, which is characterized by a vast number and variety of projects on the periphery of digital humanities, has set a stage for takeoff". Sneha (2015) made an extended survey of digital initiatives in arts and humanities practices in India in 2014. She in the background study on 'mapping digital humanities in India' she has found in her study that " A consultation on digital humanities for Indian Higher Education organized in Bangalore in July 2-13 and a proposed short term course in 'Digital Humanities and Cultural Informatics' at Jadhavpur University, Kolkata, were some of the early prominent instances of the use of the term. I later learn from one of the people interviewed for this study that digital humanities was already discussed in academic workshops as early as in 2010". The survey contextually brings forth the involvement of National Mission in Education and Information and Communication Technologies (NMEICT) programme which has initiated several projects on higher education. The NMEICT has now launched several programmes in which included are the Information and Library Network (INFLIBNET), National Knowledge Network (NKN), the National Mission for Manuscripts, the Digital Library of India and National Library India. It is also mentioned that digitization in humanities has been taken up in the interest of preservation and conservation of records, but are also facing some problems with copyright, defining metadata standards. In concluding the survey report Sneha mentions that "Even as I wrap up this study, some of the key questions or problems of definition, ontology, metadata remain with us, as the 'field' (DH) – if there is such a thing- is incipient in India. So there is a scope for its development

and as mentioned in the report there is need for addressing some issues regarding, copyright, metadata and ontology and others, even from the Indian context. So the prospects are clear that there is need for a greater involvement of LIS professionals for DH and also from the Indian viewpoint. Besides these narratives, there are several other initiatives on DH are going on in India.

5. Digital Humanities Tools:

There are a number of digital humanities software tools are available which comprise from word processors, spread sheets, database management systems and some open source software. Some representative names of the software for digital humanities are;

- ePADD for analyzing e-mail archives. This was developed by Dr.Sudheendra Hangal at Stanford University.
- EpiDB – A software used for the Epigraphy database
- WINISIS – Used for the analysis of the Bhajanas of Sri Purandara Dasa by Dr. Srinivas Havnur.
- Database management systems;
- Word Processors like MS WORD and OpenOffice
- Spread Sheet like MS EXCEL for humanities data analysis
- UCINET (Borgatti et al, 2002)
- MapInfoPro V16
- CmapTools

The software tools require data set to be created for design of maps.

6. Applications:

The author has made several applications in some of the areas has also come across work done by others. The following are the list of applications done already by the author of this paper, prior to the understanding about the digital humanities concept.

- Study of Coins and Stamps
- Paintings
- Geography – Change of names of countries
- Agra Fort and Jeypore Portfolios – Jeypore Palace Architechture
- Indological Knowledge and Its Syllogism
- Medicinal Plants

- Cartoons
- Digital Curation and Historical Informatics

Apart from the above contributions made by the author, he has come across about the projects done by Late Dr. Srinivas Havanur, former Professor of Kannada, Mangalore University and the Librarian, Tata Institute of Fundamental Research, Mumbai, on Dasa Sahitya. The author has had an opportunity to collaborate with Dr. Havanur's work to develop a database using Micro CDS/ISIS.

Apart from the work mentioned above, it is worth mentioning the work of His Holiness Dr.Shivamurthy Shivacharya Mahaswamini of Taralabalu Sirigere, who has been instrumental in developing two software packages known as ;

- Ganaka Vachana Samputa – A unique software on Vachana Literature of 12th Century A.D.
- Ganakasthadhyayi – A unique software on Sanskrit Grammar based on sutras of Panini. This software derives its name from the original treatise namely, Ashtadhyayi, the software is therefore named as Ganaka(Computer) Ashthadhyahi. (http://www.taralabalu.org/#)

Both the software packages are available free for use by any body and can be downloaded from the URL of the Taralabalu Math.

7. Digital Humanities in LIS Studies:

Digital Humanities can be incorporated in the LIS Curriculum as an Open Elective for the studies by LIS departments and by the Social Science and Humanities departments in the Universities. This will help for an active collaboration of LIS department that with, Social Science and Humanities departments, and particular with History, Archeology and Language and Literature faculties in the universities. They can also undertake joint projects and undertake research involving students from the collaborating departments.

There are several curricular models on Digital Humanities integrating the components from Library and Information Science, Humanities, Social Sciences, Architecture and Information Technology departments.

8. Conclusion:

The paper has given an over view of the potentiality of digital humanities research going in other countries and also a glimpse of what is happening in India. This country has a unique and diverse cultural heritage and also well developed ICT

sector. So it is apt to adopt the digital humanities applications in our country and look forward to build a suitable digital content on Art, Archeology, Music, Museum and Libraries and can be shared with other countries. It is one of key areas of research which fosters intensive collaboration between diverse faculties and scholarship.

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Author's Profile:



Dr. A.Y.Asundi, former, Professor & Chairman, Department. Library and Information Science, and also In-charge IT Centre Bangalore University, Bangalore, has a rich blend of experience as practitioner and an accomplished teacher for more than four and a half decades in the country. A Ph.D. from Gulbarga University, did research in Library Classification. He has also imbibed expertise in Information Technology and taught to MCA, MBA and MIEB programmes. His experience has blend of traditional and modern knowledge of LIS. He has successfully guided 8 Ph. Ds. He was a Member of the Core Committee of CDC of UGC for the preparation of LIS Curriculum and was responsible for the preparation of the Status Report. He has Ten books to his credit, and nearly 200 Papers. He has completed 4 Research Projects. He is also member of the Advisory Panel of IFLA/SIG on LIS Education in Developing Countries.

Information and Communication Technology Services and Facilities for Sri JCBM: A case study of college library.

Prasanna Kumar H E* Dr.F.G.Patil**

Abstract: Libraries are the repositories of the knowledge and form and integrated part of any education system. Important role of Library and information services in the academic excellence of any institution. In order to bridge gap between library and users for the effective and maximum utilization of the ICT resources have to be adopted. An attempt has made to highlight the services and practices in the sri.jcbm college library and information centre, Sringeri.

Keywords: ICT, Profile of Sri.jcbm college, Facilities and services

1. Introduction

Today the world is shrinking into a global village and we are living in an era of globalization where there is interchange of attributes among different societies. Globalization is the growing integration of various countries to the world economy. The pace of process of globalization is increasing day by day and this is possible with the advancement of ICT which overcomes the geographic barriers between different parts of the world ICT made it possible for the people to interact and communicate beyond the geographic boundaries. To pace and explosion of both information and Technology has reduced the concept of space and time. ICT is the most powerful tool for change in all the spheres of life. Information and technology is very important but not without communication because it is communication which reduced the distance for the transmission via different modes.

The world is in the throes of innovation with the new technological era and profession of Librarianship is in comfort today with the availability of technology. Vast number of technology is available now, and technology innovations are the future. These innovations and innovative ideas including artificial intelligence, robotics, speech synthesis, electronic mail, CD/DVD ROM,CD networking, barcode systems, Electronic publishing, hypermedia, multimedia, tele facsimile, radio data paging, networks etc, share common technology revolving around electronics computers, telecommunication, printing and reprography, popularly known as Information Communication Technology (ICT).

2. Definition of ICT

According to UNESCO (2002) Information and Communication Technology (ICT) is defined as the combination of informatics technology with other related technologies, especially communication technology. Information Technology is defined as the technological applications of informatics in society. Informatics is defined as the science dealing with the design, realization, evaluation, use, and ,maintenance of information processing systems, including hardware, software, organizational and human aspects, and the industrial, commercial, governmental and political implications of these.

The National Policy of Information and Communication Technology in School Education (2012) has defined Information and communication Technologies 'As all devices, digital and those that can be converted into or delivered through digital format and services, digital and those that can be converted into or delivered through digital forms, which can be deployed for realizing the goals of teaching learning, enhancing access to and reach of resources, building of capacities, as well as management of the educational system.

3. Profile of Sri JCBM College

The academic, social and spiritual elements of Sri JCBM College combine to offer the students many windows of opportunity. Their learning experience is designed and delivered by 75 plus staff members in 14 departments. The college offers 5 programme options under UG one programme options under PG. In keeping with the vision of academic excellence besides core courses. Two certificate courses are offered to meet our vision of skill enhancement. Life skill course is offered to all the students for their holistic development. The college has excellent infrastructure facilities in terms of ICT enabled lecture hall, library e-learning centre, laboratories, faculty, offices, Main Hall, Language lab and recreational spaces etc. In appreciation of the high level of academic excellence through quality education NAAC has certified in institution with 'A' grade in the year 2012 (highest score among chikamagalore dist in Karnataka)

Motto of the college

EKAM SAT is the motto of the college. The forms a part of the SOURA SUKTA of the first Mandala of Rigveda. The meaning of the motto is 'Truth is one' This is in tune with the doctrine of advaita propagated by Shankara Bhagavatpadacharya, who established the Sharada Peetham in Sringeri, which incidentally happens to be the first of four Mathas founded by him. The selection of this motto for our college is indicative of our desire that our students should imbibe the high ideals of truth in their life. The

college has ample reasons for claiming that it has been progressing in the right path in achieving its objects.

Vision

Education given in our institution should result in overall development of physical, intellectual and moral facilities of the students, who on leaving the institution can contribute their mite to the growth of the nation as responsible citizens.

Mission

The vision and mission statements of the college are displayed prominently in the college. They are communicated to the students, the teaching staff and to other stakeholders through their incorporation in the college prospectus, college calendar and college magazine. They are also communicated to the parents and the new entrants when they attend admission interviews and the orientation programmes.

4. Needs and objectives:

- The tremendous growth of ICT and stress for adoption in the field of library and information services
- To know the information resources available in Sri.jcbm college library.
- Availability of information in the form of e-resources through internet.
- To know the different services provided through ICTs
- The knowledge of ICT facilities

5. ICT Facilities and services:

Library Automation:

Sri.jcbm library was computerization in the year 2004; later in the year 2005 installed to Easylib software that was from Easylib Software Pvt. Ltd, Bangalore. All the housekeeping operations of the library like accessioning and cataloguing, circulation serial management, report generation and OPAC etc, were computerized. In the year 2012 it is upgraded with web version of easylib.

Internet and Wi-Fi facility:

All the 15 systems in the e-resources centre having internet connection with 100mpbs speed. Along with this the whole library is having Wi-Fi Connectivity. Faculty members can make use of internet free of cost

INFLIBNET N-List and Other E-resources: Library has taken intuitional Membership from INFLIBNET N-List from 2010. Under this we are able to access6000+ e-journals and 13500+e-books. Along with this there are other subscribed resources as well as open access e-resources also made available to the users single window

Barcode Technology: Barcoding technology is implemented in the year2008 for all the books and student ID cards. This will facilities efficiency in the circulation system. Also save the time.

Orientation Programme: The Librarian has been conducting orientation programme to the new students admitted every year academic year both for UG and PG students separately. The orientation programme includes the facilities and services available in the library collection, rules and regulations, OPAC search e-resources etc. Orientation will be arranged even for the newly joined faculty members. This helps them to get acquainted with the library resources.

Presentation and Training : OPAC online public access catalogue form an important part of many digital library's collection. It allows user to search for the bibliographical details contained within a library collection. Now days it also provides access to electronic resources and databases in addition to the traditional bibliographic records. Presentations and training will be given by the librarian to use OPAC, e-resources, the search techniques both for the students and faculty members.

Organising Book Exhibition: Library is organizing book exhibition by the special national days every year.

ID card Printer and ID Cards: Installed Id card Printer and enabled card is given to all the users. This is also save their time.

New Arrival: Other than new arrival books display, list of new arrivals will be sent to all the departments through departmental e-mail fortnightly.

Institutional repository: Institution is taken from institutional repository with faculty publications and question papers and project reports are in developing stage.

6. Conclusion:

ICT is a born to every aspirant of education system. With the introduction of new innovative practices, the mode of delivery of facilities and services of library has really changed. The above mentioned description presents the situation in respect

of Sri.jcbm college library. The new facilities introduced by the library in this part of the country are commendable as the library has become a model for the state. Library is serving as a model for library computerization and e-information services.

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MANAGING HUMAN RESOURCES IN SPECIAL LIBRARIES: PERCEPTION OF LIS PROFESSIONALS

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Abstract: Management of human resources in libraries is one of the important aspects in management of libraries as a whole. The present paper deals with the perception of library professionals working in the two special libraries NASSDOC and NISCAIR regarding the four facets of human resource management. These are recruitment and selection, performance appraisal, training and development and work environment present in their respective libraries. Likert scale questionnaire was used to obtain responses.

Keywords: human resource management, recruitment and selection, performance appraisal, training and development, work environment

1. Introduction

Human resource management refers to all the activities an organization uses to modify the behavior of all the people who work for it. (Susan E. Jackson and Randall S. Schular, 2013) These activities include recruitment and selection of right manpower to the right position, their induction into the new environment, their further training and development, timely appraisal to keep them motivated and the maintenance of encouraging physical as well as social work environment. Human resource are the most valuable asset and have always been central to every organization including libraries. The success of organization depends upon the knowledge, skills and abilities that the human resource possess. Effective management leads to effective utilization and exploitation of these resources. NISCAIR and NASSDOChas a rich legacy of resources, both capital and human. Core activity of these institutes is to develop human resource and to store, publish and disseminate scientific and technological information through a mix of traditional and modern means that will benefit the Research and Development community and other segment of society in India and abroad with special thrust areas of Libraries and Information Centres. This article presents the perception of the staff regarding the practices followed for managing human resources in their own libraries.

2. Literature Review

The broad objective of the study undertaken by **Jain(2005)** was to present a model for strategic human resource management through an effective staff performance appraisal system in Botswana Public Libraries. As a result main critical qualities required to provide efficient public library services were revealed as: enthusiasm, positive attitude, innovative thinking, and commitment. Staff related and motivational issues were identified as: a sense of achievement, a feeling of self-worth, job-security, staff recognition, status, career development, good salary, effective communication, job satisfaction, delegation of authority, clear job description, performance feedback, conducive working environment. Some strategic management issues were also acclaimed as: organisational culture, transformational leadership, employee recognition and reward systems, performance measurement system, productivity improvement, and customer orientation. **Mapulanga(2014)**identified the staff development and its challenges in the University of Malawi Libraries and emphasised on professional qualification in Library and Information Studies as due to financial constraints, the majority of the library staff lacks LIS professional qualifications. He also recommended that libraries should consider budgeting for continuing professional development. In his study, **Nicolescu(2009)**presented the contextual and conceptual novelty elements concerning human resources on which human resource management approach relies. The conceptual uniqueness element is represented by the comprehensive approach of human resource management focused on the relationships of the organisation with internal and external human resources and methods and techniques grouped in the 14 activities used in human resource management is also presented. **Olusegun (2012)**conducted a study to identify the influence of motivation on turnover of Library Personnel in the Public Universities in South West Nigeria. The population consists of 129 Librarians and 104 Library Officers in public Universities in South-western Nigeria. The study revealed a relationship between turnover intention and job motivation. The study revealed that the level of motivation is not very high among the library personnel. In case of turnover intentions a large number of them would quit if they have opportunities for better pay in similar organisations Based on the results, there is a correlation between turnover intentions and job motivation of library personnel. **Rajesh (2014)** in his study assessed the recruitment, selection, training and development, compensation and performance appraisal practices in three, four and five star hotels under private and KTDC in Kerala from 2000-01 to 2009-10. It was deduced that employees in KTDC and those working in five star segment in private sector adorned with high wages, good working condition, job security equity and possibility of advancement. **Singh(2003)**surveyed 19 academic

libraries of Lucknow to study the issues related to human resource management in them. It was found out through the survey that the working people in libraries are not satisfied with their job, work culture and promotional aspects. Author has given the suggestions to improve these services and also strategies to implement those suggestions. **Smith(1998)**discusses the importance of a strategic approach to human resource development in an environment of rapid change. HRD is defined and the characteristics of a strategic HRD are identified.it is viewed that HRD is a strategic imperative-nationally, organisationally and individually. **Tziner(2001)**collected data in seven separate samples in three countries and examined the relationships between perceptions of one's organization, beliefs about appraisal systems and raters' orientations to appraisal systems and specific rating behaviours. It was found out that attitudes and beliefs accounted for substantial variance in raters' likelihood of giving high or low ratings, willingness to discriminate well from poor performers, and among various aspects of job performance when completing actual performance ratings.This study conducted by **Warraich (2011)**aimed to explore the contemporary HRM practices and function in university libraries of Pakistan and to analyse the ways they are following the modern trends of HRM. Survey was done using questionnaires sent to all heads of the ULs in the Punjab province and on the basis of this, the second questionnaire was sent to the professionals to know their preferred motivators on workplace. In the next phase 20 interviews were conducted with library leaders from 16 ULs.

3. Scope

Human resource management is a vast area of study. This article studies the four aspects under it which are recruitment & selection, performance appraisal, training & development and work environment. The special libraries under study are NASSDOC(National Social Science Documentation Centre) and NISCAIR (National Institute of Science Communication and Information Resources).

4. Objectives

- To study the different aspects of human resource management practices followed by the libraries under study.
- To find out the satisfaction level of employees towards different aspects of human resource management.
- To compare the HRM climate existing in the special libraries.

5. Methodology

A Likert scale questionnaire (comprising 29 questions) was used to obtain responses from the professionals working in the special libraries under study. These professionals were holding positions equivalent to or greater than assistant librarian. Total 9 questionnaires were distributed out of which 8 were completed and returned. The 5-point Likert scale has been scored as follows: SA =5; A = 4; N=3; D=2; SD=1.

6. Data Analysis

Recruitment and Selection

Table 6.1: Recruitment and Selection

S. No.	STATEMENT	SA	A	N	D	SD	WAM	%
	Library has clearly defined recruitment policy that is strictly followed.	3	4	1	0	0	4.3	85
	Valid and standardised procedures are used in the selection process of employees.	3	4	1	0	0	4.3	85
	Interview is the better way to evaluate the candidate than written tests in case of external sources.	1	4	2	1	0	3.6	72.5
	Young people with better qualifications prove to be better for the library than the old people with experience.	1	3	3	1	0	3.5	70
	Adhoc employees should be regularised according to their level of performance.	3	2	2	1	0	3.8	77.5
	Current recruitment and selection procedure is fair and unbiased.	2	4	1	1	0	3.8	77.5
OVERALL		13 (27.1)	21 (43.8)	10 (20.8)	4 (8.3)	0 (0)	3.9	77.9

In this section professionals were asked questions relating to recruitment and selection procedure followed in their respective libraries. 87.5% respondents agree that library has clearly defined recruitment policy and it is strictly followed. Also maximum respondents (87.5%) strongly agree that valid and standardised procedures are used in the selection process. WAM for this statement is 4.3. 62.5% staff agree that interview is better than written test. 50% says that qualifications must be preferred over experience. This statement obtained the score of 70%. Also 62.5% respondents were of the view that Adhoc employees must be regularised as per their performance in the job. 75% said that they are satisfied with the current recruitment and selection process. The total score obtained by this facet is 77.9%. The following graph shows the respondents view.

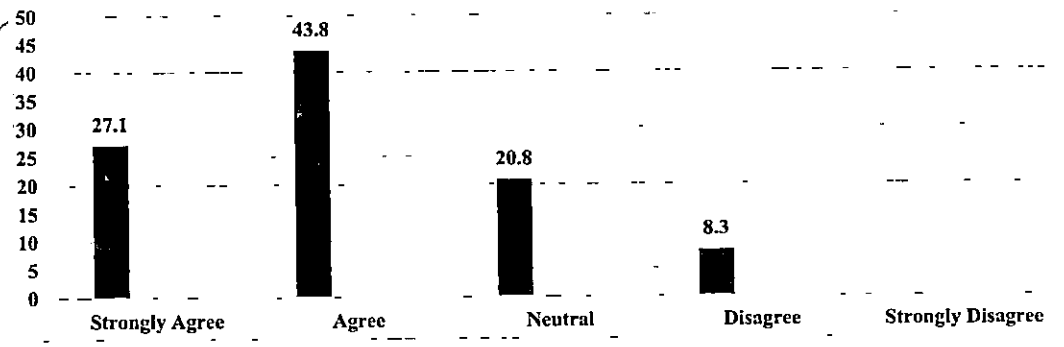


Figure 6.1: Recruitment and Selection

Performance Appraisal

Table 6.2: Performance Appraisal

S.No.	STATEMENT	SA	A	N	D	SD	WAM	%
	The appraisal data is used for making decisions regarding job rotation, training & compensation, transfer, promotion, demotion, suspension, dismissal are based on appraisal system	2	2	3	1	0	3.6	72.5
	Appraisal system is meant to discipline the employee rather to improve their performance.	0	0	2	6	0	2.3	45

	Employees are provided performance based feedback and counselling.	0	6	1	1	0	3.6	72.5
	Performance appraisal system is fair and objective.	1	5	2	0	0	3.3	65
5.	It also recognises developmental needs of the employees and helps them to attain their career goals.	0	4	0	2	2	2.8	55
6.	Satisfied with the criteria of appraisal followed in your library.	1	6	1	0	0	4.0	80
OVERALL		4 (8.3)	23 (47.9)	9 (18.8)	10 (20.8)	2 (4.2)	3.3	67.1

Half of the respondents (50%) agree that the appraisal data is used for making decisions regarding job rotation, training & compensation, transfer, promotion, demotion, suspension, dismissal etc. and also help them to attain their career goals. 75% respondents disagree that appraisal system is a form of strict action taken to discipline the employees. Maximum employees (75%) agree that employees are provided performance based feedback and counselling and performance appraisal system is fair and objective. There is no consensus among the staff that the appraisal system recognizes the developmental needs of the employees and helps them to attain their career goals. 87.5% respondents are strongly satisfied with the criteria of appraisal followed by their libraries.The overall score obtained for this facet is 67.1% with WAM of 3.3 which means employees are well known of this aspect being followed in their library. Following graph shows the response of the professionals.

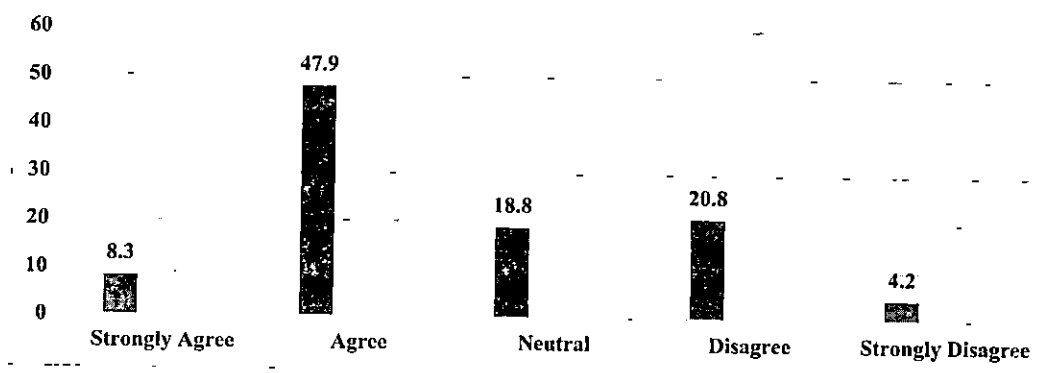


Figure 6.2: Performance Appraisal

Training and Development

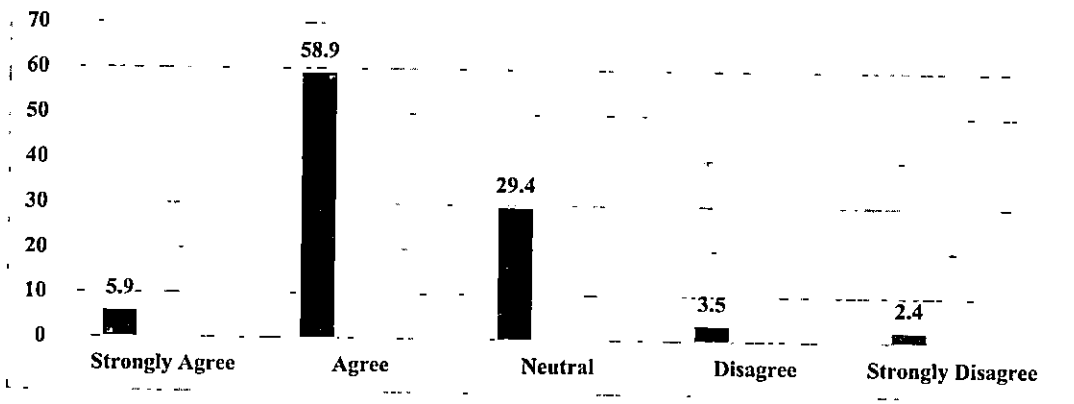
Table 6.3: Training and Development

S.No.	STATEMENT	SA	A	N	D	SD	WAM	%
	Staff is encouraged to participate in various seminars, conferences, workshops, etc.	2	5	1	0	0	4.1	82.5
	Off the job training is preferred over On the job training.	0	5	3	0	0	3.6	72.5
	Present Training system is adequate to meet the job requirements.	0	6	2	0	0	3.8	75
	Post Training employees are given opportunities to try out what they learnt.	0	6	2	0	0	3.8	75
	Library provides opportunity to obtain formal professional qualifications.	1	4	2	1	0	3.6	72.5
	Computer and e-media application forms the need of adopting training program.	1	5	2	0	0	3.8	77.5
Web-based Training must be preferred over other methods of training.		0	3	4	1	0	3.3	65
	Quality of training programs provided is excellent and evaluated periodically	0	1	7	0	0	3.1	62.5
	Training & Development activities help in the increase of productivity in terms of both quality and quantity.	1	6	1	0	0	4.0	80
	Top management is willing to invest a considerable amount of their time and resources to ensure the development of the employees.	0	3	2	1	2	2.8	55
OVERALL		5 (5.9)	50 (58.9)	25 (29.4)	3 (3.5)	2 (2.4)	3.9	77

Under this section questions regarding training and development procedures were asked. Of- the-job training is preferred over on-the-job training by the majority of professionals (62.5%) and the staff are encouraged for the same. Professionals are given opportunities to try out whatever the learnt during the

training programs and 75% agree with this. 62.5% say that library provides opportunity to obtain formal professional qualifications. Only 37.5% agree that web-based training must be preferred over other methods of training. The fact that technological changes including computer and e-media application forms the need of adopting training program by the libraries for the staff at every level is agreed by 75% of the respondents. Staff agrees that the quality of training programs provided is excellent and evaluated periodically and these programs do increase productivity of the employees. Following graph shows the responses of the professionals.

Figure 6.3: Training and Development



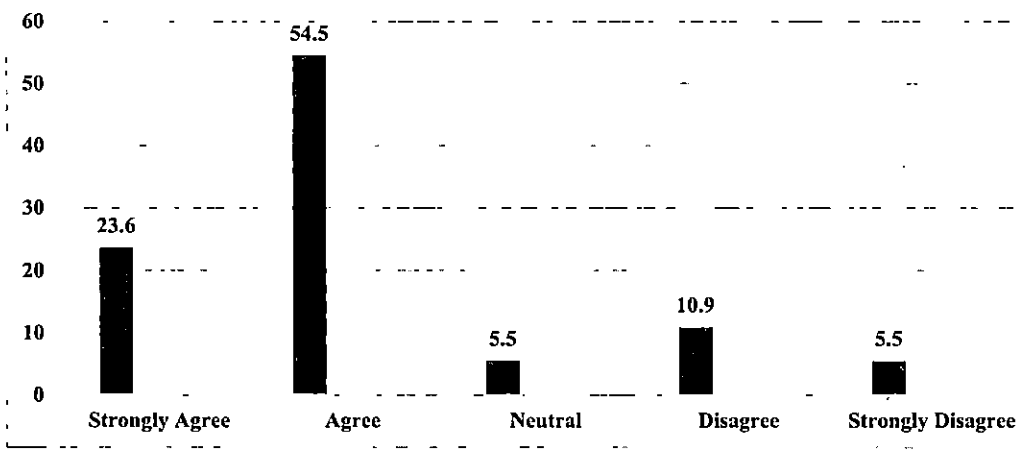
Work Environment

S. No.	STATEMENT	SA	A	N	D	SD	WAM	%
	Working conditions, lighting & ventilation in the library is comfortable.	3	4	0	1	0	4.1	82.5
	The social environment of youth library is satisfactory.	2	5	1	0	0	4.1	82.5
	You are supported by your colleagues and senior when you need some help.	2	6	0	0	0	4.3	85
	Job security is fully guaranteed in this job.	2	6	0	0	0	4.3	85
	Recreational activities, culture tours are organised in order to let the employee show their creativity and enjoy.	0	5	1	0	2	3.1	62.5
	Any kind of favouritism exists in your library.	0	1	1	5	1	2.3	45
	Job is respectful and prestigious	4	3	0	0	0	4.0	80

OVERALL		13 (23.6)	30 (54.5)	3 (5.5)	6 (10.9)	3 (5.5)	3.7	74.6

Table 6.4: Work Environment

Under this facet responses were obtained regarding the view of respondents towards work environment present in their libraries. Maximum respondents (87.5%) agree that the social as well as physical environment is comfortable. All the staff agrees that they are supported by their colleagues whenever required. Activities for leisure are organised for the staff. 75% are of the view that no favouritism exist in their work environment. 87.5% i.e. maximum staff feels that their job is respectful and prestigious. The overall score obtained by this facet is 74.6% with WAM of 3.7 which lies in 'agree' zone and shows that the professionals have a clear perception regarding the environment present in their libraries. Following graph depicts the responses.



Figur 6.4Work Environment

Overall scoring

Table 6.5: Overall Score

S. No.	Categories	SA	A	N	D	SD	WAM	%
1.	Recruitment & Selection	13 (27.1)	21 (43.8)	10 (20.8)	4 (8.3)	0 (0)	3.9	77.9
2.	Performance Appraisal	4 (8.3)	23 (47.9)	9 (18.8)	10 (20.8)	2 (4.2)	3.3	67.1

3.	Training and Development	5 (5.9)	50 (58.9)	25 (29.4)	3 (3.5)	2 (2.4)	3.9	77
4.	Work environment	13 (23.6)	30 (54.5)	3 (5.5)	6 (10.9)	3 (5.5)	3.7	74.6
Overall Score		35 (14.8)	124 (52.5)	47 (19.9)	23 (9.7)	7 (2.9)	3.7	74.2

- The above table shows the overall score of all the facets under study. The total percentage score obtained by the recruitment and selection category is **77.9%** with mean score of 3.9. 70.9% professionals showed awareness regarding this facet. 56.2% professionals agreed with performance appraisal and final score is **67.1%.** The score obtained by training and development facet is 77% and 64.8% showed positive response towards this. 78.1% are in favor of positive work environment present in their libraries. Overall more than half (67.3%) respondents have shown a positive perception regarding the four facets of human resource management process being followed in their library system. Total percentage score obtained is 74.2% with mean score of 3.7. Recruitment and selection facet is most positively perceived by the professionals of special libraries followed by training and development.

Figure 6.5: Overall Score

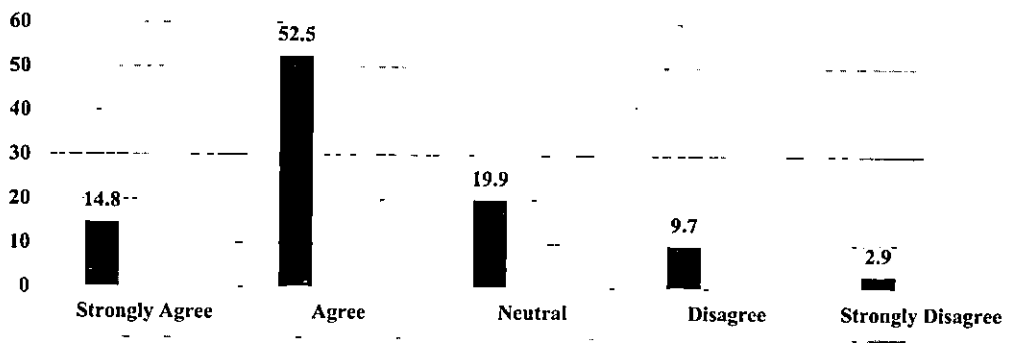
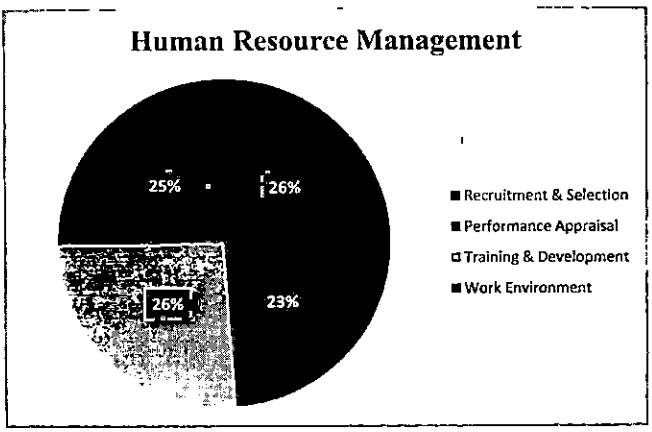


Figure 6.6: Human Resource Management



Major Findings

1.Maximum staff agree that interview is better than written test in the selection process.

2. Many professionals are of the view that Adhoc employees must be regularised as per their performance in the job.

3. Professionals are satisfied with the recruitment and selection process being followed in their libraries.

4.Maximum employees agree that performance appraisal system is fair and objective and are strongly satisfied with the criteria of appraisal followed by their libraries.

5.Of- the-job training is preferred over on-the-job training by the majority of professionals.

6. Staff agrees that the quality of training programs provided is excellent and evaluated periodically and the training system is adequate to meet the job requirements.

7.The social as well as physical environment present in the special libraries under study is comfortable.

8. Maximum staff feels that their job is respectful and prestigious.

7. Conclusion

It can be concluded that the professionals of special libraries are having a positive perception regarding the facets of human resource management taken under

study. Most clear picture is regarding the recruitment and selection procedure followed by the training and development activities. The staff are satisfied with the recruitment and selection processs well as the performance appraisal system being followed in their libraries. The training and development activities followed in the libraries are up to the mark. Also the existing work environment is satisfactory.

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Mobile Applications in Libraries

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1. Introduction

In the age of information explosion, it is challenge to provide the necessary information to users at the right time. Mobile technologies have made communication and information access very convenient and timely to users from their own homes and office and from wherever they are on move with their cellular phones or PDAs (personal digital assistants). Mobile technology has now come up with "Libraries in hand" trend. Mobile devices are able to access information from the remote source within very short time. Now days many college and university libraries have digital collection and it is accessed through computer. However, as mobile phones can be used as good alternative for accessing digital libraries. Digital collections can be made available through digital library on users mobile phones. Mobile devices are truly personal devices. Search histories and physical locations can be used to produce more accurate, individualized information and services. The focus of this paper is on application of mobile phones in library services and consequent challenges. Now days most of the students and faculties have their own cell phone and laptop, so libraries have opportunity to produce new services and provide instant access of information contents.

2. Mobile phones and library services

In the age of information communication technology, the academic libraries have changed its services and housekeeping operations for providing access to its collection. Libraries are deeply interested in channels for dissemination of information, such as mobile phones, telephone lines and cellular networks and internet. Academic libraries have been challenged in satisfying their user's needs, since their target market (researchers, lecturers, undergraduate, and postgraduate students) is demanding and dynamic. Like most of the service institutions, academic libraries need to engage in marketing their products and services. From a marketing communications perspective, the challenge to most libraries is to attract users to the library and to retain them. Mobile phones and e-mail are important tools to facilitate prompt handling and response to the

stream of users questions from within and out of the library user community.

Short Message Services (SMS) or text facilities available on all mobile phones, can be used to create awareness amongst the academic library users about upcoming events and new arrivals. Academic libraries need to keep abreast of the dynamically changing needs of their clienteles. Mobile library service is such a specialized and personalized information services that it can be achieved using the wireless technologies made available to all. Renewal notifications could be sent to alert users that books are almost due or overdue. Mobile websites offer free SMS to mobile phone services on the Internet. The literature reveals a great deal of information on the possible use of cell phones for Internet access. As cell phone technology continues to evolve and it will have as significant impact on libraries as the Internet.

3. Benefits of Mobile phone services

Interactive Capabilities

The mobile Web offers users to accessing information quickly and it helps to interact library staff to obtain specific reference away from library.

Ability to Access Information

Through the mobile web, user can access information to anywhere at any time and it will be of great help for users who cannot visit library in person and provides a constant link to required information resources.

Time Saving

Mobile devices offer users to browsing and searching library resources. Users no need to wait at library transaction counter to renew/reserve books and therefore the time of user is saved.

Personalized Service

Mobile library service is a specialized and personalized service that helps to interact library professionals and gain specific references.

User Participation

Libraries can enrich OPAC by allowing users to incorporate user created content like notes or images uploaded by users

Limitless Access

All online resources accessible on their desktop also become accessible through mobiles.

4. Mobile library services:

SMS alert service

Through the text messaging library professionals should alert the users for new book notice, informing availability of reserved documents for collection, appraising about which/when books are overdue, library circulars, e-journals subscribed, change in timing, information about important events, etc. Such alert notifications can be generated automatically using integrated library management system/software.

Instant Messaging (IM) for Reference services

Mobile devices can useful for instant answers like definitions, meanings and other information from digital libraries and web. While institution has its own IM network, library can also use web-based free instant messaging services from Google, America online, Way2sms etc.

Suggest a purchase

Librarian can receive the suggestions from the users via mobile phones. In such cases users need not to visit the libraries and write the requirements in a register.

Library Instructions and Virtual Tours

The library users, who don't have time to attend on-site workshops, can get access to library

tours on their mobile devices. Audio/virtual tours can be produced fairly quickly and it also

can reduce staff time spent helping new users to orient themselves in the library and

explaining the services provided by the library.

OPAC on Mobile phones

Libraries can provide their catalog on the mobile devices. Libraries are required to interact

with the software vendors to create mobile compatible WEBOPAC. For example OCLC's

World Cat Mobile application pilot allows users to search for and find books and other materials available in their local libraries through a web application they can access from a

PDA or a smart phone.

In-house search

Library and institutions provide access to their owned databases and resources. User should just enter search terms and can see results that are designed specifically for mobile viewing.

Research consultation and instruction

It is a kind of customer care service. Library staff provides reference service to researchers through mobile phones. Research scholars may have an interaction with the library staff to get the consultation and get suggestions via mobile phones such as specific definitions and information contents.

Journal finder

Library Journal Finder provides access to full text journal, magazine, and newspaper content as well as links to titles held in print. For example, American University library has providing option to search journals through mobile phones.

News and Events

Information on job openings, varieties of scholarly competition, library events such as orientations program, stock verification, book recall, lectures on special topic, news in relation to scholarly work, awards and so on can be given using mobile devices in order to update the user knowledge. Short messages regarding the library events and news can be sent to the users personally.

Reference service

Library users can ask librarians anything through the live chat and texting with mobiles. The reference services can be provided with the help of sending and receiving SMS. Immediate feedback is also possible from the user side.

New Title Preview

Mobile gadgets can be used to disseminate the information about newly acquired documents which are of irrespective of forms.

Wi-Fi Internet Access

Mobile phones are available with 3G facility. Libraries can offer wi-fi facility to users.

Through the Wi-Fi library users can access all electronic publications within library campus.

Challenges

Defining content for the Mobile library

Present mobile devices are limited by the speed to access internet connection, small screens, slow processing and limited storage capabilities. One of the most important barriers is the

limited memory of mobile devices. An important factor of a successful Mobile library is how technology or the medium affects the information displayed, defining what amount and what type of information is appropriate.

Design of the format

The formation of contents is suitable for a desktop computer may not be suitable for a mobile device because of the limitation of a small screen size. Content for mobile display should be in smaller segments and information needs to be re-organized. Such as the size of the text, images, graphics and tables, and the size and physical location of pop up windows will need to be re-defined.

Separate the content from the format

The successful mobile library is that which should work for a broad range of devices. In other words, it should be device independent. This object may be resolved through efforts to broaden the capabilities and flexibility of web browsers which separate the content from the format.

Display models

This is an important challenge for library professionals to select display model because display models for various operating systems and browsers vary. We should use a program to recognize whether the device is a portable PC or a mobile device. Afterwards,

the system chooses the proper style sheet and display model to specify the sight of the page. Even though the two sets of style sheets and display models result in difficulties in design and maintenance.

Lack of a standard

Limitations in existing technologies, present operating systems and web browsers make a challenge for mobile library creators. They presently lack of capability or the flexibility for an application to be displayed properly on all devices. The mobile library developers should maintain a standard to display contents properly on devices

Handling of PDF documents

The most mobile library has links to learning resources in Adobe PDF format. But, there is a problem to PDF support on Blackberry devices. A Blackberry user cannot view a PDF document using his/her web browser. To avoid this problem, documents widely used in the mobile library site are re-organized into HTML for viewing with a Blackberry.

Handling of multimedia file types

This is a great challenge for the future development as large and complex learning objects require flash, shockwave, java applets and other plug-ins because the mobile library site has links to a wide variety of audio and video files. There is problem to support audio/video for the model being tested and all of these may not work on the all mobile devices.

5. Examples of mobile library Web sites

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

- PENNLibraries, University of Pennsylvania. A multitude of information at your fingertips, such as mobile versions of databases, image search, library video clips, and more. Access: http://www.library.upenn.edu/m/
- University of California Riverside Libraries. Glossy icons designate many useful categories, including research guides, library workshops, and links to the library's social media profiles. Access: http://m.library.ucr.edu
- Virginia Tech University Libraries. A simple but effective layout offers important information, such as library hours, contact information, catalog search, and library maps. Access: http://m.lib.vt.edu/

6. Conclusion

Application of mobile technology in library services is the need of the hour. Interaction with the user community can be achieved (enhanced) due to advancement in mobile technology. Now students can access a wide range of digital resources and library services and truly engage in learning activities using any mobile devices wherever and whenever they choose, not just at their desktop PCs. The impact of mobile technology implementation raised strong awareness amongst library staff for the need to acquire skills to realize the associated benefits. The academic institutions are marketing their product and services through mobile devices. The challenge of academic libraries is to create and compelling information services and to make digital content available in a way that user community will find not only acceptable, but tailored to their needs. The mobile revolution offer both challenges and opportunities for academic libraries.

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Relevance of Library Automation in Public Libraries of Karnataka

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Abstract: Effectiveness of a library services is at present largely depends upon the application of Information Communication Technologies (ICTs). The present paper attempts to explore importance of modern technologies in public libraries. The study makes out the literal reasons to use computer and related technologies in libraries. It also delineates the existing status of public library system of Karnataka, advantages and challenges of ICT based library system. Unfortunately the public library system in Karnataka lacks the basic infrastructure to support ICT implementation and also it lags behind in terms of its accessibility to the common man in Karnataka.

Keywords: Library Automation, public library Automation, ICT, public library, Karnataka, KPLA Act,

1. Introduction:

ICT is a growing phenomenon in the society. The trend now is information and communication technology, library and information centres have undergone various stages on transformation, storage and retrieval of information application in delivering library services. Ranganathan (1957) says in his five laws of library science which cut across all ages that "Library is a growing organism"

The impact of Inforrrmation Communication and Technology (ICT) on the Library and Information Centres, library developments, especially Library Automation is vast and significant to a great extent. The public libraries are on the doorstep of a globalised era of profound and exciting transformation. The national communication infrastructure

for modernization of public libraries is missing. This needs to be introduced. Public libraries with stray exceptions here and there have, so far, had no access to computer facilities and therefore, neither the library staff working in public libraries are familiar with the computer application, nor are the users able to have access to such facilities...

Application of ICT has brought drastic changes in the long-established activities of libraries. Taking into consideration the importance of application of information technology in public libraries, a number of researchers have worked on the various aspects of public libraries, such as the development, prospects and problems of public libraries, impact of IT on public libraries in the rural area and other aspects. The present study is also one of such attempts.

In general, a Public Library is regarded as People's University. The primary function of the public library is to create awareness and initiatives to feel library is an integral part of their career. Availability of right information accurately, precisely and timely is of critical importance. With the introduction of new information technology libraries are now expected to use various types of technology to provide information more quickly and greater volume than before.

The learning society demands fast, flexible and need based education with application of Information Communication and Technologies (ICTs). This will result in great challenges for the librarians. To cope up with the new world librarian needs to make changes in his/her professional attitude and be able to create a new image of themselves by upgrading their knowledge. The use of IT enables provision of specialized, user oriented library and information products and services effectively and efficiently. The public library system in Karnataka is not an exception to this. It is the right time for the public library system in Karnataka to introduce and provide ICT based services to the people of Karnataka and to help and assist the rural elite for the use of latest IT for their day today activities for the fast growth.

2. Public Library

Public libraries have always been the door to learning for a great majority of the populations that they serve. They are knowledge centres and contribute to lifelong learning. Public library is the centre of information which provides services to its booklover (person who reads) on the basis of equality of access for all, regardless of age, race, gender, religion, nationality, language or social status free of cost. The public library is the local gateway to knowledge, provides a basic condition for lifelong learning, self-governing decision making and cultural development of the individual and social groups.

UNESCO Public library Manifesto proclaims belief in the public library as a living force for education, culture and information, and as an essential agent for the fostering of peace and spiritual welfare through the minds of men and women. UNESCO therefore encourages national and local governments to support and actively engage in the development of public libraries. The public library is the responsibility of local and national authorities. It is supported by specific legislation and financed by national and local governments. Public libraries must therefore, be allowed to play a role of fundamental importance in the development of future systems of lifelong learning.

3. Karnataka Public Library Act (1965).

The newly formed Karnataka state passed on 22nd April, 1965, the Karnataka Public Library Act (KPLA)

The act has been highly acclaimed by no less a person than Dr. S. R. Ranganathan. The provisions and the momentous features, much required for an overall development of public library system are included in the KPLA, an improvement upon the already existing Acts of Tamil Nadu (1948) and Andhra Pradesh (1960) and the Model Public Libraries Bill(1963).

The KPLA is responsible for the creation of an independent directorate. It has a provision to appoint a professionally qualified person as Director, to manage, Supervise, direct and control the entire public libraries affairs in the state. The State Central Reference Library is the apex organization, followed by City Central Libraries (CCLs) and their branches in the urban areas and District Central Libraries (DCLs) in the rural areas.

The salient features of Act are:

1) Provision for a State Library Authority in the form of a corporate body with Minister in-charge of Education as Chairman.

2) Provision for creating an independent Department of Public Libraries, with a professional as its head.

3) Provision for the establishment of State Central Library at the apex of Public Library System in the State.

4) Constitution of Local Library Authorities for the cities and districts.

5) Provision for setting up Advisory Committee for Branch and Village Library Services.

6) Provision for the levy of library cess in the form of a surcharge on all possible taxable units of the State revenues.

Thus, the Public Library movement in Karnataka started with a big bang and a great concern to serve the public in promoting the lifelong education, and increasing awareness of culture, heritage, etc. of the land in particular and of the world in general.

4. Present Scenario of Public Library System in Karnataka:

Karnataka has played a significant role in the national scene, since 1965, Karnataka public library system is considered as model for whole country. At present public library system in Karnataka state comprises 29 district central libraries (DCLs), 26 city central libraries (CCLs), 15 mobile libraries, 490 branch Libraries, 107 service stations, 5766 gram Panchayat libraries, 21 Aided libraries, 200 slum libraries and 600 reading rooms in slum areas. Infact Karnataka is one of the first state to establish rural libraries in all gram panchayats.

5. Library Automation:

Library Automation is the use of automatic and semi-automatic data processing machines to perform such traditional library housekeeping operations like acquisitions, cataloguing, serial and circulation although these activities are not necessarily performed in traditional ways, the activities themselves are those traditionally associated with libraries; library automation may thus be distinguished from related fields such as information retrieval fields, automatic indexing and abstracting and automatic textual analysis." In short Library Automation means the use of computers to perform the different routines, repetitive and clerical jobs involved in the functions and services of the libraries.

6. Need and Purpose of Library Automation:

The exponential growth of information has made manual system redundant necessitating requirement of computerized information storage and retrieval. Effective and efficient handling of huge quantum of information is only possible by using computers, which have the added advantage of being highly accurate, and timely that adds value to information. Use of computers in automating the library routines is specifically useful for the following reasons:

- Much of the works involved in library are repetitive, tedious, and mechanical in nature requiring accurate updating of records in files. The same bib-

liographic record in a library is used to perform multiple operations. Each operation may concern with individual copies of a title. A bibliographic record created at the time of ordering a document is first used for its acquisition, then for technical processing and subsequently for library OPAC, circulation, binding, etc.;

- Automation permits decentralized access to a bibliographic record by multiple users. A staff member in a branch library can verify the status of an order without maintaining duplicate files or without making an enquiry. A user can check to see if a book is out on loan or available on the shelf of the library;
- The application of information technology in libraries results in increased operational efficiency. It ensures ease of functioning, accuracy and economy in human labour with greater speed;
- The library staff, specially the younger ones, finds use of computers interesting and exciting. Use of computers can be a motivating factor for several library staff members;
- The IT increases productivity of library staff. It relieves professional staff from clerical chores so that they can be fruitfully used for user-oriented library services; and
- It improves quality of services rendered by the library.

7. Advantages of Library Automation:

- Acquisition, accessioning, classification, cataloguing, circulation, serial control, information storage and retrieval, indexing etc. can be mechanized by using library software.
- A machine readable record can be used by many users for various purposes at many number of times. For example, a record created for acquisition section can be used for other purposes like accessioning, circulation etc. this saves the time of library staff.
- Library automation relieves the library staff of repetitive work and save the time of the library professionals in routine housekeeping operations.
- ***Speed*** Information processing is done much faster which ensures better work flow through the library.
- ***Accuracy*** The degree of precision and accuracy in processing information is high. However, it is dependent on the accuracy of information led into the system.
- ***Cost Effectiveness*** Operating costs can be reduced if the system is well designed and well managed.

- ***Reduction in library workloads*** Library workloads can be reduced as the computer can do vast amount of work and processing.
- ***Improved services to users*** High rate and better quality in performance is possible through the use of computers.
- Avoids / eliminates duplication of work.
- Easier access to external databases
- Providing on-line access and search of information possible.
- Eliminates human errors while performing routine library work

8. Impact of Library Automation in Public Library system:

Automation has affected most library processes to some extent, and in many cases has influenced the development of library policy. In the area of cataloguing the effects of library automation have been so far-reaching and profound that a separate discussion of their impact seems warranted. The effects may be seen in four general areas.

1) Extent of cataloguing information presented to the users.

2) Choice of information given.

3) Arrangement of information.

4) Typographical presentation of such information.

The last of these areas is one of the most interesting from a mechanical point of view, but certainly the least significant so far as cataloguing policy is concerned. Libraries, however, have bemoaned the uppercase mentality of computers and related machine since their use in library work began. The resulting catalogues were certainly less attractive and less readable than the printed or typed cards with which most people were familiar.

Automation pertains to the theory, technique or art of making a machine, advices or purpose more fully automatic. Presently, it is used in co-occurrence of computerization. Computer and information processing hardware play a major role in the process of automation by reason of inherent ability of a computer to growth decisions in impact, govern or control the process from the information collected by the computer concerning the position of the process.

The present century demands for automation in almost all types of libraries including public libraries. At the international level IFLA and UNESCO these two organizations are always bringing pressure on the public libraries automation especially

in the developing countries like India.

9. Importance of Library Automation in Public Libraries:

- More time to work with the library users
- Speedup of searching for users.
- Better access to the collection
- Allows easy sharing of resources sharing with other libraries
- More interface with the library users with other information resources
- Better facilities for the users as other libraries are also automating
- Enhances consistency in the collection, streamlines circulation
- Time saving of clerical and repetitive tasks
- Ease of maintenances of statistics and overdues
- Report to the management

ICT has made a huge impact in every aspects of human life. Public library is not an exception to this. But unfortunately the majority of the Public libraries have lagging behind in the use of Information and Communication Technologies. Gone were the days when printed books and journals are only medium for getting knowledge. Its prime challenge for the public libraries to use ICTs for spreading knowledge.

10. Library Automation Resources and Services:

An automated library is one where a computer system is used to manage one or several of the library's key functions such as acquisitions, Circulation, Cataloguing, Serials control and the online public access catalog. The automation is economically feasible and technologically required in modem libraries to cope up with the requirements of new knowledge, the enormous increase in the collection of materials, problems of their acquisition, storage, processing, dissemination and transmission of information

Library automation software covers two major functional areas, namely a) control and management of library resources b.) Access to documents and information. These two areas deal with library house keeping system and text retrieval systems respectively. There is a provision for library house keeping operation, public access of information, producing publications as well as control and manipulating statistical and financial data. Besides this, barcode generation, network support, data conversion, multimedia support etc. are other additional features of library automation software.

11. Public Library Automation- Need of the hour

In this ICT driven era, public libraries are lagging behind to cope up with new advancements. If at all public libraries wants to keep their relevance in this modern society they need to embrace and adopt new technologies like library automation. The automation of public libraries is not only going to speed up library housekeeping operations but also it will attract new users to library especially the youth. Therefore, state and local self governments has to take initiative to automate public libraries by providing financial and other resources.

With newer technological advancements the information seeking behavior of the user has also changed. Computer and information technology are pervading into every sector of this society. They should be introduced in the public library system in order to provide the muscles and strength to face the challenging and changing requirement of the society. Computer will act as efficient tool to store, organize and retrieve the material in the libraries. They can aid the library staff to discharge their duties efficiently by and accurately. It will help in immediate access to specialized information, economy in human labour, money and time. Automation of the public library therefore is the urgent need of the hour.

In the changed scenario librarians have to equip themselves with the existing and new information communication technologies to enhance their status and also to achieve the basic objective for which the public libraries have been established. The Karnataka is considered as a hub of software companies of India and it has been named as silicon city of India. Hence it is a high time for the government of Karnataka to adopt and provide quality and automated public library services to the people of Karnataka.

12. Challenges of Library automation In Karnataka:

Human Resources/Scarcity of Staff:

The development of a library depends greatly on its human resources. Staff is a mirror of any organization. All housekeeping operations and services including automation of public libraries are based on well educated and trained staff.

13. Training for Library Personnel:

The well trained and adequate number of staff can play a dominant role in providing effective and efficient services to the users of the public library. At present there is inadequacy of trained and competent staff to render effective public library services, forcing most services to be operated by semi and non-professional staff, which damages

information organization and services. The problem of educated and competent professionals preferring to work in special and academic libraries than public libraries. The reason for this is the salary is very less as compare to academic and special libraries.

14. Public Library Budget/Paucity of Funds

The finance plays a significant role in automation and administration of a public library. No plan can meet any momentous success in the absence of requisite funds. The finance is the axis round which the entire machinery of a plan revolves.

15. Inadequate Infrastructure Facilities

Automation requires computer hardware, software, communication and networking systems, Electricity backup system, furniture and other infrastructure. Budgetary provision for the infrastructure is a must for automation and development of public libraries.

16. Conclusion:

Today computer and related technologies has brought revolutionary changes in the whole world of information. Perhaps, this is the most existing period in the history of human race when world's most population is shifting from 'techno-illiterate' to 'techno-literate'. The society undergoing kind of transformation. With the passing of each day, we find that 'Information Communication Technology (ICT)' has affected almost every sector of life, bringing change in the case of people's think, interaction etc..., this revolutionary change is also true in case of libraries and information centres. In the modern world library and information professions have changed and adopted itself developments of Information Communication Technology (ICT).

Automation of Public Libraries has to travel a long distance in Karnataka and what is required at the present time is the willingness on the part of the state government to support the cause of library automation and by bringing major amendments to the existing Karnataka Public Library Act (KPLA), 1965. Library automation depends on adequate infrastructure, quality manpower and regular financial resources but unfortunately the respective governments such as central and state they are not encouraging and supporting the cause of quality public library services. The only remedy for this is the state government must come forward and financially support the public library system in the state of Karnataka.

In turn people can get quality information and services and they can involve in fulfilling the dream of India in general and Karnataka in particular.

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SELECTED ONLINE NEWS PAPERS IN INDIA: A STUDY

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Abstract: ICT revolutionized the information industry and news paper is an important source of information. So the format and its access has changed drastically with the application of internet. Now with the help of e-papers retrospective issues of newspapers can be retrieved very easily. This paper highlights and covered the nature and importance of online/e-papers.

Keywords: Online – News paper, e-paper

1. Introduction

Indian newspapers have more than 400 years of history and the first newspaper was initiated in the mid of 1700 i.e. The Bengal Gazette. India has more than 2000 daily newspapers in 100 languages with a combined circulation of 88 million and some of leading dailies are Hindustan Times, The Mint, The Telegraph, Asian Age, Indian Express, Financial Express, The Pioneer and many more. There is a list of free and pay wall blocked digital online newspaper archives. Most of them are scanned from microfilm into pdf, gif or similar graphic formats and many of the graphic archives have been indexed into searchable text databases utilizing Optical Character Recognition (OCR) technology. Some newspapers do not allow access to the OCR-converted text it is proof read. Older newspapers are still in image format, and newer newspapers are available as full text that can be cut and pasted. Google now indexes many newspaper archives. Information is essential for all activities in today's information society. Current information is most demanded and needed by various research groups and individuals. Newspapers are the most prominent sources of current information. They bring to the readers the global information by overcoming all Geographical limits. In this regard, the online version of newspaper is more helpful. Online newspapers contribute a lot

to the 'Information Democracy' and 'Right to Information', since users can access them irrespective of their location.

These online editions fulfill the law, 'Information for all' by their universal availability and access. The importance of newspapers for people of all walks of life, institutions, government and countries in general, need not be overemphasized. It is truly a reflection and narrative of a society, status and its culture. Researchers too turn to newspapers for casual as well as quality research. It is interesting to note the continued relevance of the newspapers in the traditional paper format even when the publishing and transmission of news as well as newspapers across the world have migrated to newer paradigms and platforms such as the Web, Blogs, PDAs, Mobiles, and Readers etc.

An online newspaper, also known as a web newspaper, is a newspaper that exists on the WWW or internet, either separately or as an online version of a printed periodical. Going on line, crated more opportunities for newspapers in presenting breaking news in a timely manner. The credibility and strong brand recognition of well-established newspapers, and the close relationships they have with advertisers, are also seen by many in the newspaper industry as strengthening their chances of survival. The movement away from the printing process can also help decrease costs. Online newspapers are much like hard-copy newspapers and have the same legal boundaries, such as laws regarding libel, privacy and copyright, also apply to online publications in most countries, like in the UK (Wikipedia). Some newspapers have attempted to integrate the internet into every aspect of their operations, i.e., reporters wringing stories for both print and online, and classified advertisements appearing in both media; others operate websites that are more distinct from the printed newspaper.

Physically on the basis of publication policy, online news papers are as follows:

2. Only Online News Papers

Online only paper is a paper that does not have any hard copy connections. It is independent web only newspaper. An early example of and "online only" newspaper or magazine is "News Report", an online newspaper crated by Bruce Parrello in 1974 on the PLATO system at the University of Illinois. Beginning in 1987, the Brazilian newspaper Jornaldodia ran on the state owned Embratel network, moving to the internet in the 1990s. By the late 1990s, hundreds of U.S. newspapers were publishing online versions, but did not yet offer much interactivity. One example is Britain's Weekend City Press Review, Which provided a weekly news summary online beginning in 1995.

- **Hybrid News Papers** - There are some newspapers which are predominantly an online newspaper, but also provide limited hard copy publishing.
- **Soft Copy News Sheet** – A news sheet is a paper that is one or two pages only. Soft copy sheets are like online news papers, in that they have to be predominantly news, not advert or gossip based. These sheets can be updated periodically or regularly, unlike a news paper. They must also like a news paper be regarded as a news outlet by media groups and government.

According to the last annual report on the press in India, today there are 31, 264 new titles published in India, including 4,043 daily newspapers and 27,221 weeklies/Magazine, ninety-nine languages and dialects are represented. Hindi is the predominant language of publication (13,650 titles) followed by English (5,525), Urdu (2,353), Bengali (2,115), Marathi (1,639) and dominates with nearly 30 million copies circulated, followed by English. But Malayalam is third reflecting no doubt the high literacy rate in the southern state of Kerala.

Today India has more than 2000 daily newspapers with a combined circulation of 88 million and some of leading dailies are The Time of India, Hindustan Times, The Telegraph, Asian Age, Indian Express, The Economic Times, The Pioneer and many more. With the introduction of the internet, web-based 'newspapers' have also started online-only publications. In India, Major newspapers went online to provide latest and most updated news from them. Some newspapers even provide e-paper which is regarded as the digital replica of the newspaper. The demand for online newspapers has been increasing for the past few years with the growing reach of internet. India's 70,000,000 (Seventy million) internet users comprise approximately 6.0 percent of the country's populations and about 4.010,000 people in India have access to broadband internet as of 2008 figures. Online newspapers are much like hard-copy newspapers and have the same legal boundaries, such as laws regarding libel, privacy and copyright.

3. The First Indian News Paper

The first printed newspaper of India was in English edited and published by James Augustus Hicky, an ex-employee of the East India Company. It was weekly carrying news of interest to the small community of European, mainly British, settlers in Calcutta. This Newspaper, Hicky's Bengal Gazette or the Calcutta General Advertiser, also Known as Hicky's Gazette, the first issue of which came out on 29 January 1780, carried only classified advertisements on the from page, a practice prevalent in newspapers in England.

4. Online Publications of Newspapers in India

A large number of newspapers are being published online in India to facilitate the general mass and/or a special group of people who need to access the information for their specific purposes. The following is an abridged list of leading newspapers which are being published online.

India has 29 states with 22 official Languages. Online newspapers in all major language are published from India. Let's take view of these newspapers with respect to different states.

Sr. No.	Names of States	No. of News Papers
1.	Andhra Pradesh	12
2.	Assam	5
3.	Bihar	3
4.	Chandigarh	6
5.	Chhatisgarh	3
6.	Delhi	16
7.	Goa	2
8.	Gujarat	13
9.	Haryana	1
10.	Jammu Kashmir	3
11.	Jharkhand	3
12.	Karnataka	21
13.	Kerala	10
14.	Madhya Pradesh	6
15.	Maharashtra	31
16.	Orissa	3
17.	Pondicherry	2
18.	Pubjab	5
19.	Rajasthan	3
20.	Tamil Nadu	14
21.	Uttaranchal	2
22.	Uttar Pradesh	6
23.	West Bengal	10
Total		180

English News Paper and their Archive

The table shows the total number of online English newspapers and their archives from which year these newspapers are available online some of the newspaper Archives were not displayed. It is observed that these are 29 English newspapers which are available online on the internet. The financial express newspaper has the oldest archive available on the internet i.e. from the year 1997.

S No.	News Papers	Archive	URL Address
1.	The financial express	1st may 1997	http://www.financialexpress.com/
2.	The Times of India	1st January 1998	http://www.timesofindia.indiatimes.com/
3.	Daily excelsior	1st October 1998	http://www.dailyexcelsior.com/
4.	Ranchi express	1st December 1998	http://www.ranchiexpress.com/
5.	The tribune	1st December 1998	http://www.tribuneindia.com/
6.	The statesman	1st January 1999	http://www.thestatesman.net/
7.	The telegraph	1st march 1999	http://www.telegraphindia.com/section/frontpage/index.jsp
8.	The Indian express	1st December 1999	http://www.indiapress.org/gen/mews.php/The_Indian_Express/400x60/0.com/
9.	The Hindu	1st January 2000	http://www.hinduonnet.com/
10.	Mid day	1st January 2000	http://www.mid-day.com/
11.	Business line	1st January 2000	http://www.thehindubusinessline.com/
12.	Accommodati on time	1st September 2000	http://www.accommodationtimes.com/
13.	Afternoon dispatch & courier	1st January 2001	http://www.connect.in.com/afternoon-dispath-and-courier/profile-522422.html [http://connect.in.com/]
14.	Economics times	1st January 2001	http://www.economictimes.indiatimes.com/
15.	Indian express	10st June 2001	http://www.indianexpress.com/
16.	Lokmat times		http://www.indiapress.org/gen/news.php/Lokmat_Times/
17.	The Asian age		http://www.asianage.com/
18.	The sentinel	1st December 2001	http://www.sentinelassam.com/
19.	Star of Mysore	1st January 2003	http://www.starofmysore.com/
20.	The Assam tribune	1st January 2003	http://www.assamtribune.com/scripts/detailsnew.asp?id=jun1911
21.	Deccan herald	1st July 2003	http://www.deccanherald.com/

22.	Business standrad	1st December 2003	http://www.business-standard.com/
23.	Kashmir times	1st January 2004	http://www.kashmirtimes.com/
24. The Hindustan times		1st august 2004	http://www.hindustantimes.com/
25.	Greater Kashmir	1st January 2005	http://www.greaterkashmir.com/
26.	Central chronicle	1st February 2005	http://www.centralchronicle.com/

Online News Papers available on Internet in Hindi Language

These are main news papers of Hindi language are available on Internet. Other than these Amar Ujala and Hindustan also are available as online news paper.

Sr. No.	Newspapers	URL Address
1.	Dainik Bhaskar	http://www.bhaskar.com/
2.	Dainik jagran	http://in.jagran.yahoo.com/
3.	Hari Bhoomi	http://www.haribhoomi.com/
4.	Hindi Milap	http://www.hindimilap.com/
5.	Lok Tej (New)	http://www.loktej.com/
6.	Naiduniya	http://www.naidunia.com/
7.	Nava Bharat	http://www.navabharat.net/
8.	Nav Bharat Times	http://www.navbharattimes.indiatimes.com/
9.	Prabhat Khabar	http://www.navbharattimes.indiatimes.com/
10.	Pratah Kal	http://www.indiapress.org/gen/news.php/Pratah_Kaal/400x60/0
11.	Rajasthan Patrika	http://www.rajasthanpatrika.com/
12.	Ranchi Express	http://www.ranchiexpress.com/
13.	Rastriya Sahara	http://www.rashtriyasahara.samaylive.com/

5. Indian News Paper Portal

Indianpres.org is portal providing links to the free online news papers. It includes links to all Indian Language news papers of India in language news papers. Including all regional news papers of India in language like Gujarati, Urdu, English, Assamese, Kannada, Punjabi, Bengali, Assamese, Telugu, Tamil, English, Hindi, Oriya, Kokani, Marathi and Malayalam. The current news headlines are shown on right side, on left side it shows the total 14 language news paper alphabetically arranged. These Languages shows the link to open that language news paper.

6. International News Paper Portal

Online newspaper.com and newslink.org is the two major International portals for online news papers search.

7. Problems of Online News Papers

Today Indian online news papers are facing many problems. Some of these are- One of the problems with online newspapers published from India is the font problem. Basically the problem arises in the case of Indic languages. Sometimes people need special software to read these newspapers. It is not possible for everyone to download software for each newspaper in a particular language. For example, one person can read Anand Bazar Patrika by downloading Bitstream's Web Font Player software. But to read Bartaman Patrika, he/ she have to download software though both are in Bengali Language.

The second problem is the presence of loud and stylistically unpredictable advertisements on the main page. Readers don't visit these sites to be overwhelmed by hectic colors and dizzying arrays of advertisements. Rather, they visit to read news and be informed. These ads distract and they destroy the design and the layout of the pages. The worst offenders are animated advertisements. Trying to read the headlines with one of these animated advertisements next to it is like trying to read the headlines of a real newspaper within a fish marker.

In almost every case the layout and design of online newspapers is very poor, Very few online newspapers employ intelligent use of grid, color and content hierarchy. Most have a flat aspect with no visual clues as to bow the page and its information are supposed to be consumed.

8. Conclusion

There are some advantages of online newspapers for their users-Online news papers are still mostly free of charges, often updated throughout the day, easily accessible for everyone with an internet connection and they can be visited while working at one's PC. If we see the problems of online news paper from user point of view, it is require of instruments and not comfortable than printed news paper. Many news papers are available in various languages but there are no decreased the number of traditional papers. The person who read online news paper, they also take the traditional printed news paper too regularly. We mean to say that there is no effect of online news papers on print format news papers. In other hands, we can do the darshan (see) of Vaishno Mata, Rameshwaram, Tirupati Bala

ji on internet but every person want to go those place for darshan. In my view electronic ways can never fully replace to traditional ways.

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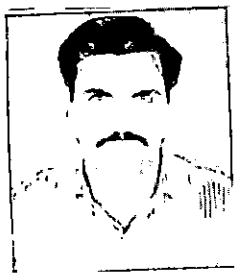
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Academic Libraries for the 21st Century

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Abstract: The future challenges of the 21st century, academic librarians will require to achieve more perceptions and new competencies. They need do more than development the knowledge must acquire to performance – to apply that knowledge in different circumstances. They also must to make themselves the multifaceted challenges of the future by allocating with fast and essential changes, managing the collection of people and views, and thinking universally. In accumulation, they must focus on both the core and peripheral variables that move libraries faster in digital environment.

The determination of this paper is to create managers, professors, librarians and panel men responsive of the significant and moving character of these professionals in the academic background. Their assignment to provide access to resources in all formats remains the same, however present has been a crucial explosion of resources and effects in the preceding few years. Not only essential they are capable with the comprehensive collection of information available but they also must be competent to work with trainers to introduce information literacy skills and to encourage life-long learning in students.

1. INTRODUCTION

Libraries are dynamic on the way to an information parks model of service, and attractive campus exposed centers. They request academic and faculty

socialization, knowledge, research, education and teaching. They are maximum material previously user interface design, services, and spaces are established in organization with others pursuingrelatedschoolingmagnitudes. Academiclibraries will gradually arrange information and services to their users at right time as per their obligation. So on the vagaries, the expected roles of a library in an Academic community, particularly those communities that aren't unstableexpressively themselves, will remain legal and essential to aneffective college or University.

Web based Library Services

In the beginning of the establishment of library it was just a store house of books and supplementary document. Common people were not allowed to use that document. After long time library in progress document delivery service and circulation came into aspect. Library services mention to facilities, which are provided by a library for the use of books and dissemination of information for the essential and encounter the user's obligation. The well-known modern library services are cataloguing, classification, circulation services, CAS, SDI, new comings, current content inter library loan, externally purchased database, internally published newsletter, reports and journals, bibliographic services and so on. All these services have changed its mode to an extent with web environment (Das, 2000).

Common Services Offered by Web-basedServices in 21st Century

Following are the very common and all-purpose services offer by the web. Out of which we may select few of them which we can apply on our library and information science field. However most of these services we can't use as a library services (Green, Elisabeth and Head, Allison J, 1998):

- ✓ Bibliographic and Cataloguing Services
- ✓ Bulletin board
- ✓ Commercial resources
- ✓ Community information
- ✓ Current Awareness Services
- ✓ Document Delivery
- ✓ Electronic Selective Dissemination of Information
- ✓ E-mail facilities
- ✓ Frequently Asked Questions (FAQ)

- ✓ Government resources
- ✓ Internet Subject Gateways
- ✓ Library catalog
- ✓ List serve
- ✓ News Clipping Services
- ✓ News Group
- ✓ Newsletter Services
- ✓ Shopping and other commercial transactions
- ✓ Subject database
- ✓ Surfing facilities

Provision of Web Based Special Library Services

❖ **Patent Information Services:**

- General information for procurement patent (full text or bibliography), list of publications, and offices like USPTO, IP office of Brazil, and Canadian patents and current awareness services form bibliographic database;
- Search can be made by investees name, applicant's name, classification symbols etc. It is free access services for the users, (http://patents.cnidr.org) . Full text of patent are not available for free services through Internet. US Patent Trademark Office (USPTO) allows access to their patent databases (http://www.uspto.gov). Internet Patent News Service provides lists of all U.S. patents issued during the previous week, available by free subscription via-e-mail;
- Derwent Scientific and Patent Information (http://www.derwent.co.uk/)–Derwent World patent index covers patent information from different patent issuing authorities and Derwernt patents citation index. Derwent's database is available a different online hosts like DIALOG, STN, Data Star, Orbit etc. They are generous links to other various patent information services;
- **Reference Services:** The reference service in a library is frequently defined as straight personal support particular to its reader for finding information. It is the subdivision of library services, which contains personal benefit given to in their search for information on different subject areas, be-

sides of size and collection of the library. The objective is to encounter the request for easy 24 hours access to electronic reference sources from the student house room, the workplace, and even the kitchen table.

- **UseNet:** The UseNet is a universal electronic bulletin board, of varieties, in which lots of people discussion public information on every imaginable topic. The UseNet newsfeed can be read by a selection of newsreader software programs.
- **UnCover:** UnCover is an online periodical article resource service and a current awareness alerting service. Examining the UnCover database is absolutely free. We have to pay only for the articles that we order.
- **Webcasting:** Webcasting which is another example of Push Technology webcasting is a method of information transfer across the web that thrusts information to the screens of user's computer. It is a webcasting was announced by the PointCast Network in 1996. Now most of the webcasters focus on news resource.
- **White Board Environment:** It is multi-user Java chat and demonstration program and consequently the systems that are connected must be enabled to download Java applets. It is different from the newsgroup in the intellect that the computer screen serves as a whiteboard and the user can draw figure using the mouse and post message/explanation in the reference box that performs at the same time with the whiteboard for other users to view.

Web-based Publishing Services in 21st Century

It is pretty hard to expect the future track of electronic publishing as it is developing quickly in tandem with enhancements in electronic and internet technology. A suggestion of the future publishing background has exposed the subsequent points:

a. Copyright issues keep on to be discussed;

b. Different publishing models co-exist and remain developing;

c. Institutional depositories will be supported and develop more popular.;

d. More use and exploitation of multimedia proficiencies;

e. Peer review is here to visit while challenges are being made to advance the system;

f. Publishers are shifting their traditional roles in becoming electronic service providers; and

g. Students and writers are becoming main stake- holders in publishing.

2. Advantages of Web Based Services in 21st Century

Following are some advantages of Web Based Library Services :

- Accessibility of information in improved places and also in different formats;
- Convenience of less number of library staff to carry out the library works and services;
- Immediate and elaborate information requirements for R&D activities;
- Information for evaluation building in Management Information Service (MIS);
- Multifold escalation of the cost of books and journals;
- Setting of laboratories/ departments in improved places in the campus;
- Need of Smaller amount for the library staff for receiving the necessary information; and
- To maintain the valuable time of the scientist /users.

3. Appeal of Libraries and Librarians in a Knowledge Based Society

Twenty–first century libraries do not have a lot in common with the customary model. Their governing component is no longer books, but electronic sources of information, containing electronic documents, databases, Web resources, e–books and virtual libraries. Maximum library–linked developments are now high-tech. Skillful development has contributed to facilitating access to the information collected throughout the world. It has changed methods of communication, and so it has changed the tasks to be undertaken by modern libraries.

Modern libraries could be compared to information malls. Moving around them can cause certain difficulties. A very common phenomenon is that of "library anxiety," mainly observed in higher education institutions where users feel uncomfortable about their level of knowledge. The main barrier is the fear of embarrassing oneself when asking elementary questions, or getting a negative feedback from a librarian.

Allowing tentative to the reader, a librarian essentially participates in the process of searching for information; this approvals to mind current hybrid libraries, which group features of traditional libraries with those using new technologies. Truly, we touch the world of "hyper–reality," with hypertexts, in which an appearance, a vision, or the play of symbols displaces real feelings and experiences. In the age of information processing, communication, and the knowledge industry, the librarian participates in building anadvanced society.

The commencement and growth of academic libraries are stirring. Various academic libraries now proceed on the key role of providing the "economical improvement" for the close relative university-a factor that is important to both staff and students. Academic libraries are putting themselves to be the standards and research centers of universities. They are time to time known as the "knowledge building" and are frequently asked to examine what significance they add to student knowledge effects. These are some explanations and observations noted at an American Association of Higher Education Annual conference in 1999 during a discussion forum (http://www.ala.org/acrl/aahe99.html).

4. Academic Library Situation in India

Cutting-edge technologies are affecting positions of Information Communication Technology which perform the essential role for web based library services. While attractive advantage of the different components of information communication technology have influence on the libraries of all segment that have to certify the following:

- Proceeds stock of the real needs of the library and its users;
- Convey practically correction in the functions of the library to create information communication technology service motivation rather than collection oriented;
- Resource allocation and networking of libraries;
- Deliberate both preservation and access as self-motivated modules of library services;
- Presentation of information and library services;
- Growth of library professionals to manage with the fresh environment; and
- Use of management techniques for allocating with the creativethings.

Regenerating the Service Orientation of Academic Libraries

Academic libraries should deliberate establishing a central training office. The office would be sustained to responsibility to provide regular, all-inclusive training in electronic technical skills, instructional distribution and design, managerial controlling skills, and remaining education for librarians and staff. It could also improve computer-based instruction for student supporters and voucher personnel to provide training in basic competencies necessary for working in academic libraries.

Cooperation and Organizations with Other Divisions on Campus

Enhanced cooperation between the library and the campus-computing center will provide significant opportunities for improvements in services. The main locus for the provision of information content, however, should be the library. Because of the complementary

relationships of academic computing, campus telecommunications centers, and libraries, some colleges and universities have questioned the appropriateness of their organizational structures, particularly when a significant investment in information systems, resources, and services is anticipated.

A powerful motivator for involvement in these processes is in the affirmation of the meaning and integrity of what academic librarians contribute to instruction and research. Library cooperation with academic departments and units in site licensing for important software and research tools, and design of library instruction to complement classroom learning definitely supports teaching and research more directly.

In addition to cooperation and collaboration with academic departments, we also need to maintain regular contacts with them. Some even advocate for having librarians keeping office hours in academic departments. It is argued that this allows the faculty to become more familiar with library services and the librarians to become more familiar with faculty needs.

Familiarity Organization

Academic libraries in the 21st century need to be learning organizations. The concept of the learning organization started in the private sector where continuous monitoring, updating, and changes are critical for staying in business. A learning organization is skilled at taking advantage of both formal and informal learning opportunities and changing its behavior and direction in response to what it learns. People in the organization continually enhance their capacity to create what they want to create through continuous testing of experience; they transform that experience into knowledge that is accessible to the entire core purpose. While this seems straight-forward and easy, it takes effort to focus attention on learn, an organization and relevant to its then to turn that learning into change. And we need to monitor change and effectiveness constantly.

5. Library Networks

Approaching of Library Growth and Challenges in the progressive period, these are either city networks or activity subject specific networks. Developing Libraries Network (DELNET), Calcutta Library Network (CALIBNET), Madras Library Network (MALIBNET), Management Library Network, etc., are important and useful ventures for networking and resource sharing (Sinha and Sathpathy 1998; 2004). The main challenge in the Indian situation is to visualize the present situation and bring about changes so as to nullify the observations made in the World Information Report, 1997-98, which are as follows:

- A big amount of the population cannot consume information, mainly if it is provided in written form;
- People in general are not familiar to pay, cannot pay or are unwilling to pay for information. In circumstance, information does not even figure in their list of requirements;
- The mainstream of the population is not information-dependent in day-to-day work and dynamic;
- The nations do not have satisfactory capability to advance in infrastructural development;
- The springy cutting-edge of the people does not have the means to access information;
- The surviving outline of economic deeds does not favor a development in information consumption;

Consequently, there has to be a coreconfigurationchange to planning with the information supplies of the unlimited conservative of the people who at contemporary do not have means to access information. Independently, the public library system in the country demands to be refreshed and re-modeled to continue with the current situation and the future leanings.

There will be necessary to change the successive on a broad-based establishment in all types of libraries:

- Library environment
- Variable and isolated services
- Managerial structure
- Library collection
- Evidence based planning
- Information and knowledge management

6. Academic Library Consortia

The increasing number ofonline databases and digital library resourcefulness in research libraries accept a demonstration to the fact that new information technologies are changing the way we consider about collections. Digital technology, being supplementary about access than tenure, getsinstant benefit to library users. Open service staff brings the important outlook that a digital collection is not there for its own sake, but for what it can provide to library users in a more reachable format. These models which compromise new opportunities for cooperation and collaboration among college and university libraries, which should be really considered by all academic libraries if they find to position

themselves usefully for the new challenges of the next century.

The modifications being capablein the present time to a fundamentally digital environment query the value of put in models based on a chiefly print environment. These approaches provide a continuous network of information resources available to all institutions of advanced learning in their group, therefore funding enormously to the teaching, research, and service missions of all its members.

The Govt. of India also made recommendation for new concepts of emerging consortia to provide public access to electronic resources over the Internet, and they are making these consortia on a countrywide basis. Notable among them are some of the important e-resources consortia are UGC's INFONET Digital Library Consortium and N-LIST Consortium Co-ordinated by INFLIBNET Centre , INDEST Consortium for IITs , NITs and other institutions of national importance covered under MHRD, , CSIR Consortium for all CSIR laboratories IIM Consortium (Sinha,.2011; Sinha and Gautam 2015 A , B). Now Ministry of HRD, Govt. of India has decided to merge all consortia under their jurisdiction and established new Digital Library Consortium Viz., E-Sodhsindhu merging UGC-INFOENT Digital Library Consortium, N-LIST and INDEST Consortium. The access is being provided to all the Central Universities, IITs, ISSERs, NITS, IIMS, and other Centrally funded institutions of national importance.

7. Opportunities and Prospects

The cutting-edgeperiod will open up remarkable opportunities for informationprofessionals. Institutions will no longer look for the old-style career demandsbut a stretchy work force which can take on different roles and responsibilities as andwhen required. In this situation the following changes are to be approved about in India:

- Amendment the schoolingcourses in the field of library and information science.
- Develop the regularproficiency and apply them successfully in the new-circumstances by approving the actual requests and connecting these services.
- Comfortablegroup to collaborative the new fields of study with the support of IT.
- Performance the role of information managers by using the new technology to be responsible foraccess to the rich resources available in libraries.

8. Conclusion

Academic librarians have aninspiring and moving journey ahead of them as they expressionthe continuous changes and developments that distinguish the new economy. Progressive approaches, effective services, proficiency in both paper and electronic environments, and a bazaar- facing conviction will forced them to proceeds on new challenges as well as to achievement both inside and outside future opportunities. With these changes, academic librarians will have to reinvent themselves through continuous knowledge to take on new, stretched, and challenging roles. Knowledge sharing and leveraging their shared knowledge will continue to support them demonstrate their value adding capabilities to the university and all its users.

Academic Libraries are now emerged as a vibrant library space where end users and library staff may find themselves more comfortable to work and use the library, access both the printed and e-resources over campus wide network provided under National Knowledge Network provision and available e-resources under e-Sodhsinghu and Institutional Repositories developed at many Centrally funded institutions and at INFLIBNET (IR@ inflibnet). Many Open Access resources are also available which needs to be categorized and included in the services of libraries for users. The smart librarians may design online reference service, cataloguing of on-line resources , subject wise list of e-resources , sending alerts to the library users using social media and other traditional means.

Many more changes can be made to provide pro-active library services to the end users. Librarians and library staff members should re-engineered themselves by acquiring latest working skills for handling new technologies and fulfilling the ever increasing users demand and prove themselves efficient on the expectations of the users. With this it may be concluded that users are supreme and we have to resort all the means to keep them coming library, using our resources, contributing their knowledge for asset creation and making the university and institutions proud.

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ACADEMIC LIBRARY WEBSITES AND BLOG AS MARKETING TOOLS: A CASE STUDY OF SESHADRIPURAM FIRST GRADE COLLEGE, BENGALURU

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Abstract: The article is focusing on Marketing of academic libraries by using websites and blogs. These are very important and handy tools to the professionals to showcase and promote their library resources and by using them they can render the best services among their users. Presently some of the academic libraries are using traditional media for marketing their services (newspapers, corporate newsletters, radio, and TV etc.). Brochures, Flyers and other print material also act as marketing tools. In the digital era, websites and blogs are acting as major tools to market any products or services. Seshadripuram First Grade College Library is also using the above said tools to market them self and by using website and blog library hosted information in a reverse chronological order. They posted images and provided links related to academic sites. In the website of SFGC Library, Comment Box facility is also available where Readers can leave comments, SFGC blog is acting as best tool for interactive with its users.

Keywords: Academic Library, Website, Blog, Marketing Tools.

1. INTRODUCTION:

After the internet revolution, most of the education institutionsand research orientedorganizationshave started their own websites or blogs. Like that only Seshadripuram First Grade College also started its own website and blog. SFGC Library and Information Centrehasfollowed the foot prints of its parental organizations and it is also created its own website and blogs for rendering services to its users. By the endof the 20th century,

most Libraries and Information Centres havestarted offering internet based services via websites or blogs. Due to these websites and blogs libraries are able to provide better services to their users and they are able to fulfil the five laws of the Library science. These websites and blogs act as one of the most important marketing tools for the libraries. By using websites and blogs,Libraries can have more successful communication with their users to understand their needs.

2. OBJECTIVES:

- To find out the role of the Website and Blog for marketing of academic library.
- To provide quality services to the library users in a cost effective manner.
- Easy accessibility of resources to the library users.
- Taking library services to door steps of the users, instead of users visiting library for accessing for requisite information.

3. SCOP AND LIMITATION:

The study is limited to Seshadripuram First Grade College library website and blog. Here researcher's main objective is restricted to examine the role of the SFGC Library Website and Blog for marketing of its Library.

4. METHODOLOGY:

Data has been collected through observation and interaction method. That same data is analysed and presented in a systematic manner.

5. MARKETING OF LIBRARY:

"Marketing is the science and art of exploring, creating, and delivering value to satisfy the needs of a targeted market at a profit. Marketing identifies unfulfilled needs and desires. It defines measures and quantifies the size of the identified market and the profit potential. It pinpoints which segments the company is capable of serving best and it designs and promotes the appropriate products and services(Kotlar)"

In general,marketing means a systematic process which is a combination of planning, concentrating on customer needs and her/his satisfaction. For advertising and disseminating current information, sources of information and services to its current and potential users, Libraries and information centres have started to see the marketing themselves by using various channels. Marketing takes service from the library to the

customer. It involves discovering of data, analyzing of data and services, market research, setting targets and objectives, etc.

6. MARKETING IN ACADEMIC LIBRARIES:

1970 was the period the concept of marketing has been extended from business sector to other sectors like public service sector. Before 1970, it was seen that marketing principles can be applied to only profit oriented organizations but slowly trends were changed and the same principles were applied to non- profit sectors also. Due to changes in education sector, marketing has gained lot of importance.

In the context of marketing of Higher Education,Kotler and Foxprovideopined as follows "Marketing is the analysis, planning, implementation, and control of carefully formulated programs designed to bring about voluntary exchanges of values with target markets to achieve institutional objectives".

According to Dodsworth, "the changes in society have lead to creation of opportunities and threats for libraries". Other surveys show that a majority of people using search engines, rather than Library for fulfilling their requirement.This has beenthe cause of alarm among librarians who see libraries in danger of losing their place as an information provider

F. Fialkoff, opined in his article "What's so bad about books?""Academic libraries have found that users are unsatisfied with their collections and are at the same time unaware of library programs and services".

Williams,concluded his article by saying "Academic libraries spend millions of dollars a year on electronic resources, yet many of them are underused and unknown to users".

Ewers and Austen, suggested in their article "If libraries want to be client-oriented, they should understand their clients' needs, their environment, their resources and strengths, and the social factors that influence users".

Noa,Aharony, opined in his article "Libraries should also identify their strength as a competitive business, employ and train staff in client relations and marketing".

Kendadamath, concluded his article by saying"Marketing is useful to university libraries to improve their image and to attract more users. Marketing helps librarians improve their reputation within their organizations and as a profession within society".

Janine Schmidt says in his article,"the products and services provided by libraries have changed considerably, due to changes in education, the impact of technology, new methods for information provision, and declining budgets and he also opined that University libraries in the digital age are eager to be current in information technology and tools for conducting research and providing current information. This has led them to focus on marketing their services".

Wu,Mu-Chen, says in his article"Marketing in libraries can lead to a better understanding of users and their requirements. Effective marketing can increase the use of services, can help train customers and non-customers, can change user perceptions and ideas, and promote the reputation of the library and its staff"

Steadilyopined, "In E-environments, libraries must identify the requirements of their users. This puts the customer at the center of library activities".

7. LIBRARY CLIENTELE:

Consumer is the boss for any profit or non-profit organization, if any form of business/ firm/ organization wants to survive, they must provide best services to their customer. For satisfying the customer, many organizations try to give such wonderful services by using various tools and technologies like blogs/ websites etc. In the present environmentLibraries must classifytheirusers according to their requirements and render desired and required services to them. For rendering the best services to its users library must adopt latest Information technology, including the use of blogs and websites.

If library starts using new tools and technologies like website and blogs for rendering services to its users they must consider following requirements

- 24/7 access
- High speed
- High quality
- Better networking facility
- Un interrupted power supply

8. THE ROLE OF THE LIBRARY WEBSITE/BLOG:

Websites and Blogs are product of the internet world. In the twenty first century, these communicationMedia have gained popularity among the youth, particularly among college goers. In present days,the above said media have increased their prominence in all types of organizations and hence, SFGC Library is also using this tool for serving its users. Due to this development, professionals of SFGC are using these virtual media to connect with its users,

other libraries and professionals. By using website and blogthe following services are rendered by SFGC library professionals:

- They are using website and blogs for Book Acquisition indent, suggestion of books, user card request, overdue reminders etc. user can write in the comments box of the website and blog
- Current Awareness Service, upcoming events like seminars/conferences/workshops/ tutorials, Book exhibitions, special lectures etc. SFGC Library where publicized by using website/ blog
- By usingblog/website, SFGC Library professionals can circulate calendar of events, list of holidays, working hours during holidays among its users.
- Through posts SFGC library can provide information related to new arrivals like books, journal issues, news papers etc.
- SFGC Library providing Services like 'Ask-a-librarian' or 'Help Desk' can also provide through blog/website to its users.
- SFGC Library Providing Live chat service, live streaming service academic events can be provided to the users by using website/blog platform.
- Frequently Asked Questions (FAQs) through blog/website will allow users to find answers and solutions for the common problems encountered in using the library services.
- Through website/blogSFGC library providing information about the general library policy/guidelines for the various types of users.
- SFGC library can providing services like online document reservation and cancellation.
- SFGC Library regularly conducts online quizzes, as an outreach activity there by creating public awareness programmes.
- Reference service can be providing using website/blog.
- SFGC Library staff can collects feedback and suggestions related to services and collection of the library, which is helping them to improve the services and activities. For this work blog acts as a useful media.
- SFGC Library staff suggest to its users how to utilize online resources, subject gateways, knowledge portals and digital repositories etc. through website.

9. AN EFFECTIVE WEBSITE/BLOG CAN LEAD TO MUTUAL SATISFACTION FOR USER AND LIBRARIAN:

Both Library professionals andusers of SFGC library are mutually benefited each other by using website and blog as follows:

A: The benefits of marketing to library users

- Comfort
- Ability to handle information and technology
- Variety of information
- Increased ability to analyze
- Maximum time of access
- Increased sense of possibility
- Minimum human mistakes
- Less interaction

B: The benefits of marketing for specialist (librarians)

- Facilitating tasks
- They canovercome communication gap
- They canovercome time barrier
- Ability to handle multiple tasksat the same time
- Providing virtual image of library to its user

Thus, marketing helps ensure the users to get right information at right time to right user

10. CONCLUSION:

Any organization can promote their products and services to its customers by using Website/ Blog andother networking toolsand technologies. These act as one of the powerful and usefulmarketing tools for any organization. SFGC Library also markets its services to its usersby using above said toolstechnologies and by using website and blog they are competingwith an outer world. It is high timeto the LIS professionals develop and organize the website and blog contents/Information in a systematic manner, it becomes very easy and simple to provide services to its

users. Thus, website and blog can be an emerging technology tool to the traditional library system for library.

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Development of LIS Education in India

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Abstract: The paper deals with the Library and Information Science education in India. LIS education in India has not become receptive to the new emerging situation. The library schools have failed to develop the required knowledge and skills relating to the use of information technology among students. As a result, the graduates from the LIS departments have little competitive potential in the information market. The paper discusses the development of LIS education in Indian. It also discusses the recent trends in LIS education in India, and challenges of LIS Education.

Keywords: The Development LIS Education; Recent Trends in LIS Education; Challenges of LIS Education.

1. Introduction:

After independence, new colleges, universities, educational institutions and learned societies were emerged and the need for professionally qualified personnel to manage their libraries was realized. As a result, the number of library science schools started to increase. Emerging from the day of initiating, LIS education movement in the country by Sayyaji Rao Gaekwad, the then Maharaja of the erstwhile princely State of Baroda, the LIS education has grown by leaps and bounds to emerge as an important discipline in modern India. India has one of the largest educational systems in the world. Library and Information Science (LIS) education in India completed 100 years in 2011.

The beginning of the 20th century marked the beginning of LIS education in India. The LIS education aims at providing trained manpower to manage different types of libraries, information and documentation centers which, over a period of time have undergone changes in terms of needs, functions, types and range of services. The main objectives of LIS profession are to: provide training for building up leadership qualities among the LIS profession; develop knowledge on the latest techniques of information storage, transfer and retrieval; help to acquire necessary skills in handling, accessing

and application of electronic resources, tools and media; and help to know the latest developments in the Information Technology (IT). In India, UGC and other national level organizations make continuous efforts to revise and update the syllabus so that products of the LIS schools of India will be found most qualitative in the market for their job prospects.

2. LIS Education – Aims:

- To develop the competent and committed library and information professionals in changing contemporary information environment.
- To acquaint students with basic Philosophy of Library & Information Science.
- To identify major issues in the development of new technology in libraries, such as Digital and Virtual libraries, and discuss their implications.
- To introduce the structure and attributes of Universe of Knowledge.

3. Historical Background:

First Library school at Baroda (1911)

W.A. Borden started the first formal Library training course in the country in 1911. An American librarian, who had in 1910, was invited by Maharaja Sayyaji Rao Gayakwad, the ruler of the Erstwhile Baroda State, who was great library enthusiast, to organize a system of public libraries in the state.

Second Library School at Punjab University (now in Pakistan)(1915):

The second training course was started in 1915 at the Punjab University, Lahore (now in Pakistan) by A.D. Dickinson. Another American Librarian and a student of Melvil Dewey.

Andhra Desa Library Association course (1920):

ADL Association course was started in 1920 and was the first library training course started by a library association at Vijayawada.

Mysore State (Karnataka State) 1920:

During the year 1920, a training course for librarians and library workers was started in Karnataka. The training was conducted in Bangalore under the programme of 'Library Development' initiated by Sir.M.Visveswaraya, the then Dewan of Mysore.

MALA - Madras library Association:

The Madras Library Association, which came into existence in 1928, mainly through the effort of Dr. S.R. Ranganathan, conducted an annual summer course in Librarianship in 1929 and 1930. In 1931 this programme was taken over by Madras University and was conducted as a certificate course for three months duration.

Bengal Library Association Course (1935):

In the 1930's the library movement in West Bengal received its stimulation from the Bengal Library Association and the Association arranged for a library training camp at Bansberia under the auspices of the Hoogly District Library Association. The Bengal Library Association started a regular certificate course in librarianship in 1937 which continued for a long period.

4. Courses at University level:

Bengal Library Association Course (1935):

In the 1930's the library movement in West Bengal received its stimulation from the Bengal Library Association and the Association arranged for a library training camp at Bansberia under the auspices of the Hoogly District Library Association. The Bengal Library Association started a regular certificate course in librarianship in 1937 which continued for a long period.

Madras University (1937)

In 1937 the Madras University started a full time post graduate course of one year duration leading to the award of diploma in library science. This was the first diploma course at the post graduate level in the country and has served as a model for the development of training programmes during the pre- independence, as well as, the post independence era. Ranganathan, taught library science courses at the University right from 1931 to 1946. University of Madras was the first university in India to offer one-year postgraduate diploma in library science.

Banaras Hindu University (1941)

Banaras Hindu University (BHU) was the second university after University of Madras to start a postgraduate diploma course in 1941.

Bombay University- (1944):

Bombay University started diploma courses in 1944. One of these courses was for the candidates who have passed matriculation and another for the students who have com-

pleted graduation.

Calcutta University (1945):

In 1945, University of Calcutta started a one-year diploma course, due to the efforts of Kumara Munindra Deb Rai. It continued till 1968 and was upgraded to BLIS in 1969.

Delhi University – 1947:

In 1947, Prof. S.R. Ranganathan moved to University of Delhi and started the first post-graduate diploma course. The first batch was awarded diploma in 1948 and continued their studies and were awarded BLIS in 1949. In the same year, a two-year programme for MLIS was introduced replacing the BLIS programme. Simultaneously, the PhD programme was launched by the university in 1949. University of Delhi was the first university to start a doctoral programme in library science in the entire British Commonwealth.

In 1956 Nagpur University and M.S. University, Baroda also started library science courses. The next year saw the beginning of library science courses in Vikram University, Ujjain. The first PhD was also awarded in 1957 to D.B. Krishna Rao from the University of Delhi. His guide was Prof. S.R. Ranganathan. Library science courses were also started in five more universities— Hyderabad, Osmania, Panjab, Poona and Rajasthan by the end of 1960. It is reported that there were about 12 library schools in 1960s, imparting library science education in the country at all levels except the M. Phil degree.

Another parallel institution, Indian National Scientific Documentation Centre (INSDOC), now named as National Institute of Science Communication and Information Resources (NISCAIR), was established under the aegis of Council of Scientific and Industrial Research (CSIR), Delhi, in 1957. It started a course in Associateship in Documentation in 1964.

Ranganthan conceptualized the premier education and research institute, Documentation Research and Training Centre (DRTC), Bangalore under the auspices of Indian Statistical Institute in 1962 for imparting a specialized training programme in documentation.

The formation of Indian Association of Teachers of Library and Information Science (IATLIS) in 1969 was another important happening towards the end of the decade. further helped in the growth and development of the discipline.

University of Calcutta introduced two-year MLIS in 1974. A landmark in the development of curriculum took place when the University of Delhi organized a national

seminar on curriculum reforms in 1978. This decade also saw the second PhD being awarded to Dr Pandey & S.K.Sharma.

In 1980 University of Delhi was one of the first to introduce an optional paper on computer application that included Pascal programming language also.

In 1985 CDS/ISIS is an advanced non-commercial information storage and retrieval software developed by UNESCO.

The introduction of two-year integrated MLIS in the North Eastern Hill University (NEHU) in 1986 and Madras University in 1988.

Andhra Pradesh Open University started a degree course in 1984.

CALIBNET was the first library network visualized and started by NISSAT. At a meeting in 1986 in Calcutta,

Indira Gandhi National Open University, New Delhi, introduced BLIS in 1989. It has played a pioneering role in LIS education, and conducts BLIS, MLIS, PhD and PGDLAN

Information and Library Network (INFLIBNET) Center, Gandhinagar, Gujarat is an autonomous inter university centre of UGC of India. It is a major national programme initiated by the UGC in March 1991.

DELNET was started at the India International Centre Library in January 1988 and was registered as a society in 1992. DELNET has been established with the prime objective of promoting resource sharing among the libraries through the development of a network of libraries. The IGNOU took the lead by introducing MLIS in the e-mode in 2008.

Present Scenario:

Presently in India, Library and Information Science (LIS) education is imparted through more than 118 universities and institutions. A total of 105 universities provide Bachelor of Library and Information Science (BLIS) courses, 78 universities provide the Master of Library and Information Science (MLIS) courses, 21 are offering two-year integrated courses, 16 universities provide M.Phil in Library and Information Science, 46 universities provide Ph.D in Library and Information Science and 2 Universities provide D.Litt Degree. Besides this, the National Institute of Science Communication and Information Resources (NISCAIR) which was earlier known as the Indian National Scientific Documentation Centre (INSDOC), New Delhi, and Documentation Research and Training Centre (DRTC), Bangalore, provide Associateship courses in Information

Science, which are equivalent to the MLIS degree. Presently the following LIS courses are available in India: - Certificate course in Library and Information Science (C.Lib. Sc) - Diploma in Library and Information Science - B.Lib.Sc. /BLIS (Bachelor Degree in Library and Information Science) - M.Lib.Sc. /MLIS (Master Degree in Library and Information Science) - PGDLAN (Post Graduate Diploma in Library Automation and Networking) - M.Phil (Master of Philosophy) in Library and Information Science - Ph.D (Doctor of Philosophy) in Library and Information Science - D.Litt in Library and Information Science.

5. Recent Trends:

- ICT has transformed the role of not only library but also LIS professional in the changing environment.
- ICT has changed the methods of information handling & communicating the relevant information to the right end user at the right time in right personal way.
- "Library users are web users, a growing group, expect customization, interactivity and customer support"
- Internet has accelerated the use of online information resources to a great extent.
- LITA (Library & information Technology Association, a division of the American Library Association) has identified top ten trends 1999 –
- Current users expect value added services, easy to use interface and want tailored information relevant to their need in e-form with a single click

6. Challenges:

Digital era needs not only a Librarian but;

- Information Expert
- Consultant
- Facilitator
- Evaluator of Global Information Resources
- End-User Educator/Trainer
- Search Intermediary
- 'Sifter' of Information Resources
- Website Builder/Publisher
- Knowledge Manager
- Interface designer

- Navigator
- Researcher and many more.

7. Conclusion:

Modern LIS Education has to offer a broad based flexible system of education which helps information personnel requirements of several sectors of economy. The LIS School can play an important role to produce professional manpower for present and future needs of knowledge society. Requirements are not same in all types of Library and Information centers, at all levels of tasks. It is a challenge for LIS School to cultivate and develop abilities in future library professionals without infrastructure facilities.

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Integrating Food Science and Technology Data as Linked Data using ontologies: A Case Study

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Abstract: Making data available as Linked Data using Resource Description Framework (RDF) helps integration with other web resources. RDF documents can inherently link to related data, and others can link back using Uniform Resource Identifiers (URIs). RDF makes the data machine-readable and uses extensible vocabularies for additional information, making it easier to scale up inference and data analysis. This paper describes the use of open standards, vocabularies and ontologies reuse for formalizing the knowledge. The FSWKB ontology framework was created using Protégé-OWL editor an open source software which allows exporting into a variety of formats including RDF, RDFS, OWL, and XML Schema. The process of data transformation was done with the Apache Jena Fuseki a component of Jena an open source Semantic Web framework in Java for getting RDF triples stored in OWL/RDF/XML format.

Keywords: Ontologies ,Linked data, resource description framework, Protégé, Food science and technology, Apache Jena Fuseki

1. Introduction

Food Science and Technology is today a major discipline with numerous research institutions, journals, research reports, patents and other kinds of publications. The fact that UN has deemed it necessary to have, as one of its organs, Food & Agriculture Organization (FAO) is an indication of the importance of the domain. Recognizing the importance of the sector, India established the Central Food Technological Research Institute (CFTRI) as early as in 1950. Since its inception, CFTRI has been carrying out R&D work in all branches of Food Science & Technology. The CFTRI has built over the years a comprehensive bibliographic database i.e. Food Technology Abstracts (FTA) of research literature in the area as it plays important role in the development of science. Presently, the information stored in knowledge base is able to present static content and cannot be used effectively by the scientific community of the institute. The information is processed in order to provide meaning to it; so the system can "understand" the texts, extract information from them, relate it and storage it. So the user can make advanced queries based on the meaning instead of the semantics. In order

for this information to be intelligently queried, it must first be formalized; ontology for formalizing this knowledge was developed. Hence, the bibliographic data has been formalized into ontology by reusing the bibliographic ontology (BIBO, 2009).

We adopted the linked data technology in order to make the bibliographic dataset openly available, more flexible, easy to share and visible, to increase its suitability for web applications. Linked data is one of the approaches used for obtaining a meaningful integrity by bringing together data groups that are associated with a specific data through forming semantic links between the web pages that make up semantic web. In this way, a data layer that takes data linked to one another as basis is formed on the basis of data and relationships between them.

The publication of Linked Data on the WWW is based on the following four principles, which have become known as the "Linked Data principles" (Berners-Lee, 2006)

a) Use URIs as names for things
b) Use HTTP URIs so that people can look up those names.
c) When someone looks up a URI, provide useful information, using the standards
   (RDF, SPARQL)
d) Include links to other URIs, so that they can discover more things.

The diagram shows datasets that are published as Linked Data on the Web and are interlinked with other datasets.

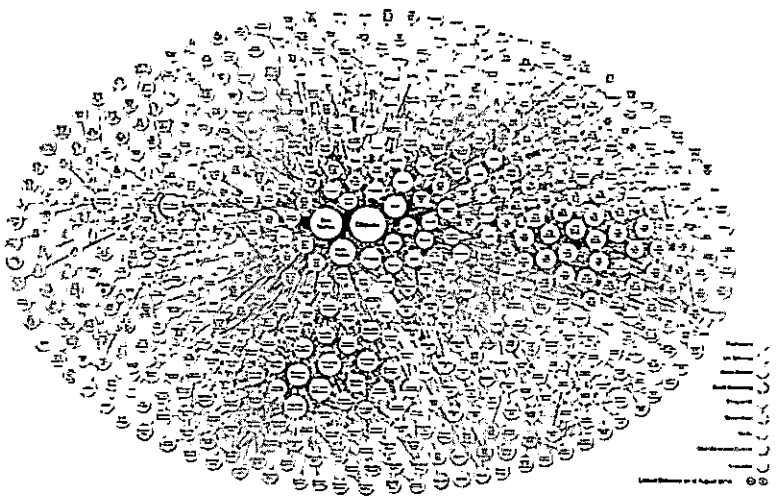


Figure 1: Linked data cloud as of April 2014

The application of these principles allows related things such as titles, authors, places, and concepts to be linked to each other such that computers can identify their relationships. Thus, the publication of Linked Data is based on standard Web technologies such as Uniform Resource Identifiers (URIs), the Hypertext Transfer Protocol (HTTP), and the Resource Description Framework (RDF) [92]. The paper is structured as follows: Section 2 describes the data modeling and its components. Section 3 describes the designing of URI. Section 4 describes RDF generation. Section 5 describes publishing the linked data and section 6 focuses on conclusion.

2. Data Modelling

Data modelling is an important task in Linked Data generation. In Semantic Web, RDF is the sole data modelling framework for modelling resources. RDF models a resource in triple representation such that, a triple denoted by T is defined as: T = {S, P, O} where, S = Subject, P = Predicate or property, and O = Object Subject denotes a resource which is being described (for e.g., article and its author), Predicate represents resource's property or relationship name (for e.g., article, hasAuthor), and the Object represents property value or another resource linked using RDF link attributes. Each of these triples, except for literal values, is identified using HTTP URIs that uniquely identifies a resource on the web. Such data representation forms a directed or labelled graph where subjects and objects (which are nodes in graph) are joined by predicate (the arc). Hence, resources in RDF are always stored in triple form. Each resource has their property and value which resembles the description of metadata. Ontology is the main building block of Semantic Web which provides concepts in describing a knowledge base. Without using ontology it is not possible to model resources in RDF.

According to Heath and Bizer (2011) the main recommendation for the modeling activity is to reuse as much as possible available and widely used vocabularies. There are several vocabularies and domain ontologies with varying potential and suitability for modeling bibliographic resources.

Example 1.1: The RDF triple http://example.org/foaf.rdf#me, http://xmlns.com/foaf/0.1/name, "Shylaja M D" states that the person identified by the given subject URI is called Shylaja, and http://example.org/foaf.rdf#me, http://xmlns.com/foaf/0.1/knows, http://www.cftri.com/empl/Srinivas states that Shylaja knows another person identified by the given object URI.

To model and examine bibliographic information, we have used these vocabularies to facilitate the linking with external data for the schema design of the linked data. The Bibliographic Ontology (BiBo), Dublin Core (DC) and Publishing Requirements for Industry Standard Metadata (PRISM) were used for the bibliographic information design. Friend of a Friend (FOAF) which is used to define people or organizations was used for authority information design.

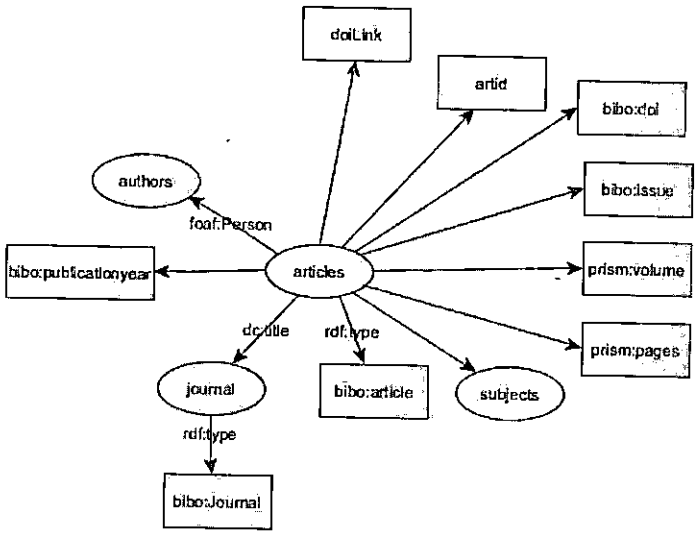


Figure 2: Concept diagram of the relationships among the objects in the linked data schema design

Standard Schemas

The data model, or schema, used to publish a dataset as Linked Data consists of a set of *terms*. Terms are either *properties*, e.g. attributes or relationships between resources, or *types* of things, e.g. Journal, Article, Person, etc.

Unique URIs are not only used to identify resources, they're also used to identify terms in a schema. For example the unique identifier for the "title" attribute in the bibliographic ontology (Bibont) is http://purl.org/dc/terms/title, whereas the unique identifier for the Person type is http://xmlns.com/foaf/0.1/Person.

By identifying terms with unique URIs it becomes possible to publish and share their definitions on the web. This supports re-use of schemas, allowing datasets from different organisations to be published using the same terms. This encourages convergence

on standard ways to describe particular types of data, making it easier for consumers to use and integrate data from a number of different sources. The Bibont dataset makes use of some of the standard schemas. These are summarised in the following table along with their base URI.

Table 1: Standard schemas (Bibont)

Name	URI	Role
Bibliographic Ontology	http://purl.org/ontology/bibo/	A rich vocabulary for describing many types of publication and their related metadata
Dublin Core	http://purl.org/dc/terms/	Basic bibliographic metadata terms like title and creator
Event Ontology	http://purl.org/NET/c4dm/event.owl#	Properties for describing events and their participants
FOAF	http://xmlns.com/foaf/0.1/	Contains terms for describing people, their names and relationships
Web Ontology Language	http://www.w3.org/2002/07/owl#	A standard ontology for describing terms and equivalencies between resources
RDF Schema	http://www.w3.org/2000/01/rdf-schema#	The core RDF schema language which is used to publish new terms
SKOS	http://www.w3.org/2004/02/skos/core#	Supports publication of subject classifications and taxonomies
frbr	http://purl.org/vocab/frbr/core#>	This vocabulary is an expression in RDF of the concepts and relations
PRISM	http://prismstandard.org/namespaces/basic/2.0/>	contains elements suitable for a wide range of content publication, licensing, and reuse situations

We can see from the previous example that the title attribute in the FOSTIS knowledge base (FSWKB) dataset (http://purl.org/dc/terms/title) is taken from the Dublin Core Schema (http://purl.org/dc/terms/) as they share a common base URI. Similarly the Person type is taken from the FOAF Schema.

The FSWKB Data Model

We describe the data model highlighting how the most important types of resources in the dataset are described. The descriptions include a list of the attributes and relationships that are commonly associated with each individual type.

The diagram below summarises the data model for author and journal article.

All resources will have an RDF type property (http://www.w3.org/1999/02/22-rdf-syntax-ns#type) and the values of this property are given in each section. A resource may have multiple types.

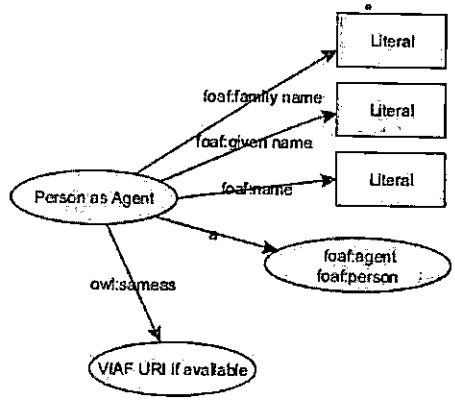


Figure 3: Data Model for Author

People

These resources all have an RDF type of http://xmlns.com/foaf/0.1/Person. The description of a person will typically include both family and given names and a person will also be associated with one or more authors. The following table identifies the individual properties used to describe people:

Table 2: Properties to describe people

Property	URI	Notes
Event	http://purl.org/vocab/bio/0.1/event	Reference to an Event resource involving the author. Usually a birth event and/or a death event
Family Name	http://xmlns.com/foaf/0.1/familyName	The surname of the author
Given Name	http://xmlns.com/foaf/0.1/givenName	The first name of the author
Name	http://xmlns.com/foaf/0.1/name	The full name of the author

2.4 Journal Article

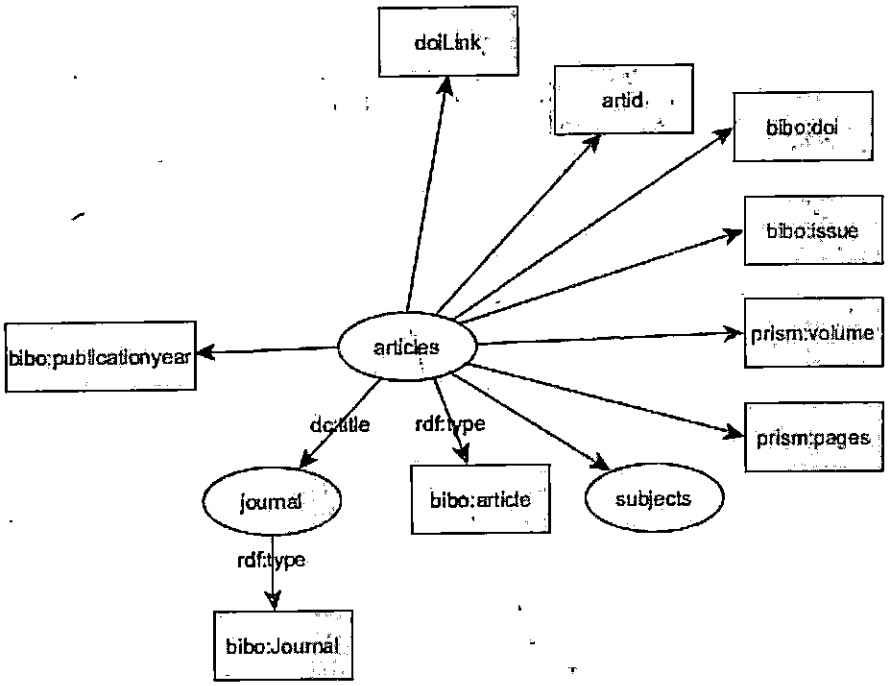


Figure 4: Data Model for Journal Article

The following table 3 lists some of the key properties of journal article:

Table 3: Properties of journal article

Property	URI	Notes
Journal Name	http://purl.org/ontology/bibo/ hasJournalName	A periodical of scholarly journal Articles
Article	http://purl.org/ontology/bibo/Article	A written composition in prose, usually nonfiction, on a specific topic, forming an independent part of a book or other publication.
Issue	http://purl.org/ontology/bibo/Issue	a given number of a periodical
Pages	http://purl.org/ontology/bibo/pages	A string of non-contiguous page spans that locate a Document within a Collection
Volume	http://purl.org/ontology/bibo/volume	a given volume of a periodical

Concepts

The bibliographic resource in the FSWKB can be associated with subject categories that help to further describe them, e.g. to indicate their subject matter. The Dublin Core subject property (http://purl.org/dc/terms/subject) is used to associate a resource with one or more categories.

Table 4: RDF schema for concepts

Property	URI	Notes
RDF Schema	http://www.w3.org/2000/01/rdf-schema#	The core RDF schema language which is used to publish new terms

3. Designing the URIs

The first and second Linked Data principles suggest that we should use HTTP URIs for naming resources. URIs for resources needs to be chosen carefully. In a domain each and every URIs should be unique so that they do not lead to duplication. We distinguish two type of URIs:

(1) Vocabulary URIs, which identify the terminological components (RDF classes and RDF properties) for describing the entities and their relationships and attributes in the RDF dataset; and

(2) Data URIs, which identify the resources (also referred to as instances or individuals) that we are publishing.

Regarding vocabulary URIs, we have reused a number of vocabularies. We have designed the data URIs that identify the bibliographic resources and have particularly used HTTP URIs. For creating the URIs we have used the natural keys pattern. The natural keys pattern is described in Davis and Dodds (2012) as the pattern of minting URIs algorithmically derived from existing unique identifiers.

In the FSWKB dataset that are added through Protégé, the system generates a number which is unique, but for bulk legacy data we append the record id to the base URI http://ir.cftri.com/fostis/fswkb/data/. For defining the namespace for our data items, we have included the word "data". For example, given that the record id of "Article'" is 614, by appending it to the base URI we identify "Article" by http://ir.cftri.com/fostis/fswkb/data/614.

4. RDF generation

The FSWKB ontology has been created using the Protégé platform which supports two main ways of modeling ontologies via the Protégé-Frames and Protégé-OWL editors. To test the performance of framework, the ontology was populated using Protégé as they can be exported into a variety of formats including RDF, RDFS, OWL, and XML Schema. It was time consuming to do manually, hence the bulk transformation process from legacy format to RDF has been carried out using MARiMbA tool developed to support the mapping process, which allows using a combination of RDFS and OWL vocabularies to model the data. The tool performs a pre-processing step that generates a set of spreadsheets, based on the source records. This spread sheets function as mapping templates where we can manually map the different meta-data elements to appropriate RDFS and OWL classes and properties.

The process of data transformation was done with the Apache Jena Fuseki for getting RDF triples stored in OWL/RDF/XML format. Figure 5 shows part of this process.

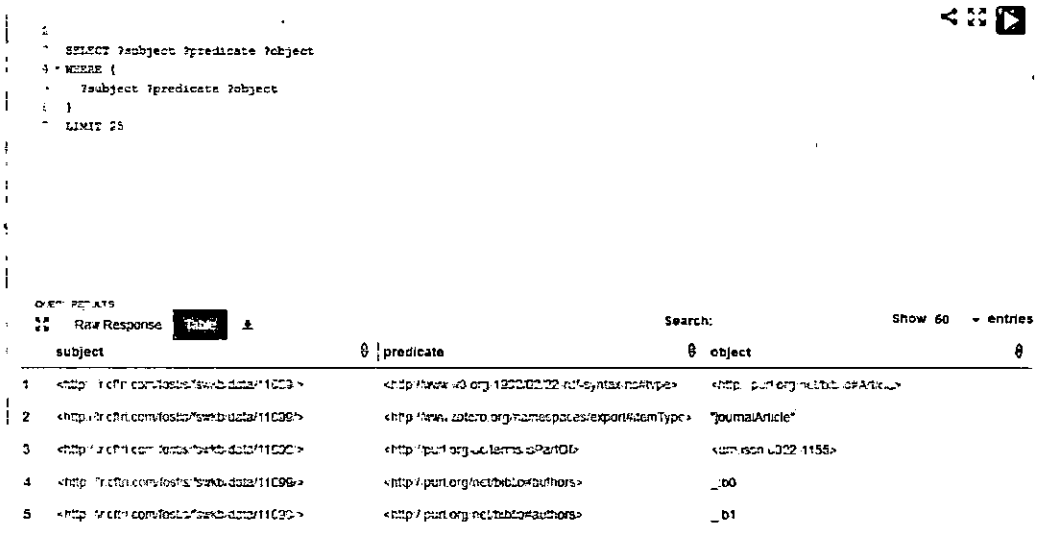


Figure 5: Screenshot of Data Transformation process

Interlinking

After the data modelling stage of the conversion we have done the interlinking so that our dataset is joined with others in the web of data. There are three types of RDF links: relationship link, identity link, and vocabulary link. Relationship link points to the resource defined in outside linked data sources. For e.g., rdfs:seeAlso and foaf:knows are relationship links which relate to the resources from outside sources. Identity links point to similar resources to get more detail

description. For e.g., the owl:sameAs property (http://www.w3.org/2002/07/owl#sameAs) is an identity link. The vocabulary links point to the description of a term defined by a vocabulary. In our work we have focused on the relationship links, fetching from outside sources such as VIAF.

- VIAF (Virtual International Authority File) at <www.viaf.org> – name of publication's author in national libraries' authority files

5. Publishing Linked data

After generating RDF resources they are interlinked with outside sources and stored into triple-store using Apache Jena Fuseki a component of Jena an open source Semantic Web framework in Java. Fuseki a linked data frontend is used for storing and querying RDF triples.

As shown in Figure 6 below, the FSWKB linked data service converts the conventional legacy data into triple data of the RDF format and saves them in the triple storage. The stored triple data can be searched through the SPARQL Endpoint, which is a linked data query language.

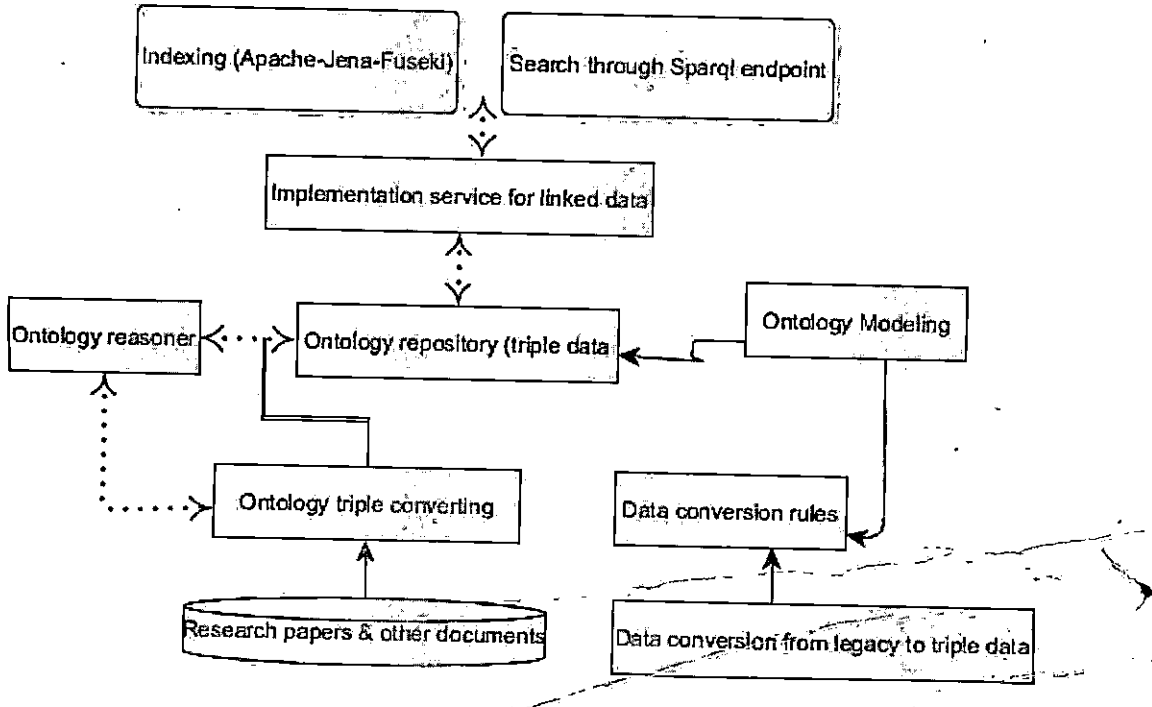


Figure 6: FSWKB linked data service

6. Conclusion

It is believed that the adoption of RDF and ontologies reuse allows formalizing knowledge that would not otherwise be achievable. More significantly, the adoption of explicit semantics simplifies integration with other resources. This is a requirement which is essential to the end users wishing to infer knowledge from FSWKB. This paper shows the development of the bibont in standardizing access to the FSWKB data in a machine-readable manner using semantic web technologies. It should be clear that these applications can be made using other technologies too, but using the RDF standards it is easier to implement them. More importantly, the solutions will be generally applicable to any domain using these open standards.

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Library Profession in 21st century

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1. Introduction:

A librarian is a person who works professionally in a library, providing access to information and sometimes social or technical programming. In addition, librarians provide instruction on information literacy. They are usually required to hold a graduate degree from a library school such as a Master's degree in Library Science or Library and Information Studies. The present paper deals with the role and responsibilities of librarians, trend in the job market of librarians, challenges faced by them in 21st century.

2. Roles and Responsibilities of librarian:

Specific duties vary depending on the size and type of library. Most librarians spend their time working in one of the following areas of a library:

Archivists can be specialized librarians who deal with archival materials, such as manuscripts, documents and records, though this varies from country to country, and there are other routes to the archival profession.

Collection development or acquisitions librarians monitor the selection of books and electronic resources. Large libraries often use approval plans, which involve the librarian for a specific subject creating a profile that allows publishers to send relevant books to the library without any additional vetting. Librarians can then see those books when they arrive and decide if they will become part of the collection or not. All collections librarians also have a certain amount of funding to allow them to purchase books and materials that don't arrive via approval.

Electronic resources librarians manage the databases that libraries license from third-party vendors. School librarians work in school libraries and perform duties as teachers, information technology specialists, and advocates for literacy. Instruction librarians teach information literacy skills in face-to-face classes or through the creation of online learning objects. They instruct library users on how to find, evaluate, and use information effectively. They are most common in academic libraries.

Media specialists teach students to find and analyze information, purchase books and other resources for the school library, supervise library assistants, and are responsible for all aspects of running the library/media center. Both library media teachers (LMTs) and young adult public librarians order books and other materials that will interest their young adult patrons. They also must help YAs find relevant and authoritative Internet resources. Helping this age group to become lifelong learners and readers is a main objective of professionals in this library specialty.

Outreach librarians are charged with providing library and information services for underrepresented groups, such as people with disabilities, low income neighborhoods, home bound adults and seniors, incarcerated and ex-offenders, and homeless and rural communities. In academic libraries, outreach librarians might focus on high school students, transfer students, first-generation college students, and minorities.

Public service librarians work with the public, frequently at the reference desk of lending libraries. Some specialize in serving adults or children. Children's librarians provide appropriate material for children at all age levels, include pre-readers, conduct specialized programs and work with the children (and often their parents) to help foster interest and competence in the young reader. (In larger libraries, some specialize in teen services, periodicals, or other special collections.)

Reference or research librarians help people doing research to find the information they need, through a structured conversation called a reference interview. The help may take the form of research on a specific question, providing direction on the use of databases and other electronic information resources; obtaining specialized materials from other sources; or providing access to and care of delicate or expensive materials. These services are sometimes provided by other library staffs that have been given a certain amount of special training; some have criticized this trend. Systems librarians develop, troubleshoot and maintain library systems, including the library catalog and related systems.

Technical service librarians work "behind the scenes" ordering library materials and database subscriptions, computers and other equipment, and supervise the cataloging and physical processing of new materials.

A Youth Services librarian, or children's librarian, is in charge of serving young patrons from infancy all the way to young adulthood. Their duties vary, from planning summer reading programs to weekly story hour programs. They are multi taskers, as the children's section of a library may act as its own separate library within the same building. Children's librarians must be knowledgeable of popular books for school-aged children and other library items, such as e-books and audio books. They are charged with the

task of creating a safe and fun learning environment outside of school and the home.

A young adult or YA librarian specifically serves patrons who are between 12 and 18 years old. Young adults are those patrons that look to library services to give them direction and guidance toward recreation, education, and emancipation. A young adult librarian could work in several different institutions; one might be a school library/ media teacher, a member of a public library team, or a librarian in a penal institution. Licensing for library/media teacher includes a Bachelor or Master of Arts in Teaching and additional higher-level course work in library science. YA librarians who work in public libraries are expected to have a master's degree in Library and Information Science (MLIS), relevant work experience, or a related credential

3. Additional responsibilities:

Experienced librarians may take administrative positions such as library or information center director. Similar to the management of any other organization, they are concerned with the long-term planning of the library, and its relationship with its parent organization (the city or county for a public library, the college/university for an academic library, or the organization served by a special library). In smaller or specialized libraries, librarians typically perform a wide range of the different duties.

4. Representative examples of librarian responsibilities:

- Researching topics of interest for their constituencies.
- Referring patrons to other community organizations and government offices.
- Suggesting appropriate books ("readers' advisory") for children of different reading levels, and recommending novels for recreational reading.
- Reviewing books and journal databases
- Facilitating and promoting reading clubs.
- Developing programs for library users of all ages and backgrounds.
- Managing access to electronic information resources.
- Building collections to respond to changing community needs or demands
- Creating pathfinders
- Writing grants to gain funding for expanded program or collections
- Digitizing collections for online access

- Publishing articles in library science journals
- Answering incoming reference questions via telephone, postal mail, email, fax, and chat
- Making and enforcing computer appointments on the public access Internet computers.

5. Trends in the Job Market for Librarians:

The role of libraries has changed dramatically since the dawn of the Internet. As the roles of libraries have changed, so have the duties of librarians. It is hard for new librarians entering the job market today to fathom reference work or library service without the aid of computers. No longer is the profession just for book lovers, it is now for technology and information lovers as well. With the advent of the electronic age, new job options have arisen for librarians. While once confined to the typical library setting, librarians, or "information specialists" can now work in a variety of special libraries, or for themselves. The job market is spectacular for employees right now, making it a particularly marketable time to be a librarian.

Because of the advent of new technologies, new avenues have been created for the information professional, including positions with dot coms, vendors, corporations, and as information brokers or consultants. While some of these positions were around before the new technologies, they are even more possible now thanks to all of the material available over the Internet. New titles have arisen since the dawn of the Internet including LAN administrator, CIO (Chief Information Officer), Webmaster, Knowledge Manager and Systems Librarian, to name a few. These new positions often earn more money than those with just the title of librarian.

With each avenue of librarianship having its pros and cons, job searchers have to quantify what is important to them. If the main goal is a high salary, one might want to look in the corporate sector. If the main objective is autonomy and flexibility, information brokerage might be the best field to enter. Finally, if job security is the most important factor, traditional libraries would be the best option. The fall of some of the "invincible" dot coms and the recent slump of the economy could lead to downsizing. Unfortunately, in the corporate sector, it is usually the libraries that are the first to go.

6. Current Challenges for Librarians:

It's clear that the library has been a valuable institution for academic purposes as long as pen has been put to paper. However, the library and its role in academic research is no doubt going through a clear transformation in the 21st century.

While this presents innovative and creative ways for libraries to remain relevant to students and researchers, it also carries its fair share of challenges. Here are the top 10 obstacles being faced by academic libraries today:

1. **Making services engaging to researchers and students:** Google is not the answer to everything - you know this, but your customer base likely does not. As a result, you have to fully absorb the needs and wants of students and researchers so you can make a substantial and engaging difference in their work moving forward.
2. **Handling research data management tools:** Libraries should be the place on campus for data creation and research management. Librarians need the support of their faculty and administrators to make this happen, but librarians also have to keep themselves well-versed in the advancements of data management so research doesn't become stale.
3. **Demonstrating your value:** Academic libraries are always on a budget. This means that month after month, year after year, libraries have to come up with compelling examples of how valuable their work is - often with a looming bottom line. However, according to the American Library Association, research has proven a connection between student grade point averages and library material usage. Staff needs to communicate this connection and demonstrate why libraries require more attention and public engagement.
4. **Preserving material on a digital scale:** Not only are there excellent products available that can help libraries achieve this - even with the biggest of collections - it's becoming the norm. According to OCLC Research, a whopping 97 percent of 169 research libraries in the U.S. and Canada have utilized digital platforms with their special collections. Based on these numbers, it's clear that software combined with a librarian's expertise is the wave of future in regard to user interface and access to academic data.
5. **A growing and diverse spectrum of customers:** You've probably noticed this already, as the 20th century underwent a massive shift in technological innovation that impacted people of all ages. On any given day, a librarian might have to help customers from six different generations, from baby boomers to millennials, according to 21st Century Library. This means that your workload might feel a bit overwhelming when you are trying to assist those who are familiar with traditional library services compared with younger patrons who are more familiar with tech-driven library software.
6. **Nailing down library policies**: With the increased usage of online tools, there are many questions that you might need to address to the administration. For instance, you might ask if the university should be purchasing e-books along-

side traditional print sources. Or, as many modern academic research centers are discovering, there may not be a need for purchasing textbooks at all. These are just some examples of library policies that staff and the administration need to pinpoint moving forward.

7. **Role development:** Open Access has required librarians to become knowledgeable in a growing number of subjects on an astounding scale. While no institution is going to expect you to process information at the pace of a computer, it might feel that way sometimes. Adding budgeting and resource constraints can contribute to this problem as well.
8. **Digital licensing:** At times, these models can be quite complex and take a good amount of research on your part. Although every academic research facility is different, College and Research News states that patron-driven acquisition of e -books is slated to become the norm, which means that digital licensing agreements should become more sustainable and easier to understand.
9. **Subject-matter expertise:** With so much information pouring into libraries at a fast pace, academic institutions need to take an active role the management of libraries. There have already been great strides taken on a national scale, such as the Digital Public Library of America that was spearheaded by Harvard University to document digital collections of archives, museums and libraries in the U.S. in 2011. However, it appears that these same efforts need to be done on a micro-scale if universities want to keep up with subject-matter expertise.
10. **Becoming familiar with a wide range of digital content:** By clearly seeing what kinds of articles, published works and e-books are being used the most by students and researchers, librarians can fully digest what types of content they need to become familiar with in a global, digital world while still providing high quality sources.

7. Conclusion:

It is evident from the literature that information technology has affected the skills and responsibilities of the librarians & academicians as well. Technology has changed not only the face of information but also the information seeking behavior of the users. Technology demands high level of technical skill set from library professionals in order to make maximum use of new technological tools for providing effective and better services to the users. Study concludes that due to changing scenario of information, the librarians working in developing countries are facing common problems such as inadequate technical skills, advance searching skills, inadequate trained and skilled manpower, use of digital sources of information, different library soft-wares, poor fiscal condition of libraries,

inadequate infrastructure, inadequate trainings, low rate of information literacy and professional status. Following recommendations/suggestions are made to bring positive change.

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Library Resources Discovery Service: Future of the Libraries

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Abstract: Day by day the online and print resources are increasing in the University libraries either from purchasing, subscribing or generating its own research output. Librarian has to seriously think over the search & retrieval system of these documents in a single window search rather to make simple search on various databases of library. To overcome of these issues, Library resources discovery service will be the option which has to adopt by the libraries soon. This paper provide an overview of the library resource discovery environment and explain how these technologies, methodologies, and products might be able to adapt to changes in the evolving information landscape in scholarly communications. This paper will also attempt to explore comparative features of library resources discovery products and services available in commercial as well as open source both and also the case study of adaptation of library resources discovery tools in Central Library, Tripura University.

Keywords: Library Resource Discovery Service, Web Scale Discovery Services, Discovery Tools, Federated search, Discovery Software, VuFind.

1. Introduction:

"In recent years, rapid modernization of online catalogs has brought library discovery to the forefront of research efforts in the library community, giving libraries an opportunity to take a fresh look at such important issues as the scope of the library catalog, metadata creation practices, and the future of library discovery in general."

As electronic resources began to grow as a proportion of collections, traditional OPACs became more limited as a means of directing users to the resources they required. Federated search, searching across a number of discrete databases from a single interface, became popular around the millennium but was only partially successful. Cross-searching databases with differently structured metadata produced patchy and incomplete results. Federated search may have been most useful in highlighting to the user which databases to search

2. Terminology

Here we are considering the only broad definition of resource discovery products as "tools and interfaces that a library implements to provide patrons the ability to search its collections and gain access to materials." These discovery products can be further subdivided into the following categories

- **Online Catalogs (OPACs)**- patron-facing modules of an integrated library system.
- **Discovery Layers** (also referred to as "discovery interfaces" or "next-generation library catalogs")- new catalog interfaces, decoupled from the integrated library system and offering enhanced functionality, such as faceted navigation, relevance-ranked results, as well as the ability to incorporate content from institutional repositories, and digital libraries.
- **Web-Scale Discovery** tools, which in addition to providing all interface features and functionality of next generation catalogs, broaden the scope of discovery by systematically aggregating content from library catalogs, subscription journals & databases, and institutional digital repositories into a central index

3. Objective of Study:

The main objectives of this study are as follows:

1. To discuss about the Library Resources Discovery Service
2. To provide details on availability of Open Source and Commercial Software for the discovery service.
3. To explain how the adaptation of VuFind discovery service in Central Library Tripura University for its 30,000 E-books collections.

Scope of the Study: This study is based on the practical approach of Implementation of VuFind-Open Source Library Resources Discovery Service in the Central Library, Tripura University. VuFind is integrated with the E-Books server having 30, 000-E-Books for making search on the content level, which is generally not possible from any ILMS software in present days.

4. Background of the Study

Central Library: The Calcutta University Post Graduate Centre (CUPGC); Agartala, Tripura converted into the Tripura University (State) on 2nd October, 1987. Again it

was converted into Central University on 2nd July, 2007. The library caters the need of information of all the subjects. The Library is presently housed in its own 03 storied building having 5415 Sq. meter total floor area out of which 2700 Sq. meter (approx.) are occupied by other wings of the University. It is a fully open access library. The library is striving hard to meet the pressing demands of the users by rendering various services both through manual & IT based system with the combined efforts of all the library staff members. We are progressing steadily towards fuller automation of the library. Over the years, the Central Library has developed a lot and may claim to be one of the richest higher educational libraries in the State. The Central Library acts as a crucial resources and learning centre of the University to meet the information needs of its clientele for the growth and overall development of the University. The collection and dissemination of data and information and the creation and sharing of knowledge are the success of the Central Library in the present era of learning.

Before the construction of the library own building, the Central Library was housed in the different buildings and locations with acute shortage of space and technical manpower. The Library is shifted to its own newly constructed 3 storied building in June 2005 having 5415 Sq. mt. total floor area, out of which 2700 sq. meter occupied by the other wings of the University. The Central Library building is the most spacious library building in the state. In coming days when the Central Library will be fully functional, the Central Library will be a land mark for Tripura. The library is well furnished with modern furniture and fixtures. The library facilities are heavily used by the students, research scholars, faculty members and visiting faculty members. Moreover scholars from other organizations also use the library facilities. The outsiders and visitors who intend to consult the library are allowed to utilize the facilities. The Central Library has a collection of 1, 35,00 books and documents presently besides a rich collection of reports, state-of-arts, non-print media, etc. The library subscribes 137 national print journals in the area of subjects taught, approx 30,000 e-books and 10 publishers' online e-journals/databases beside the UGC INFONET program. Approximately 8000 online e-journals and database with millions full text articles in all subjects/disciplines are usable under the UGC INFONET program presently.

The Tripura University Library is striving hard to meet the pressing demands of the users by rendering various services both through manual and IT based system through combined efforts of all the staff members. We are progressing steadily towards fuller automation with RFID & KIOSK system of the library.

5. Library Resources Discovery Service

Library Resources Discovery services is a new name for the traditional information retrieval system. A bit of market confusion is created by the new discovery product, vendors, projecting their products as a potential substitute for many search services

that the libraries have been using for decades like card catalogue, OPAC, Web Opac, Bibliographic database search etc. Two things are projected as key benefits of these new age discovery services. First they act as a single point search interface for all the contents (subscribed, in-house and open access) that the library wants to present to its user community for searching. It is mimicking Google, and second they operate on web scale. Most of libraries have different types of electronic resources and each e-resources database has their own search engine therefore users need to visit different search engines to get their required information for which it is required services a single point search interface for all the content has emerged, which is more effective and useful for the users.

6. How do Discovery Services work?

In the past you used to search databases (or full text), then follow links to full text. But since it was impossible to find everything via one vendor's access, you could either visit each in turn or use federated search to search across groups of vendors' products in a single step (and then link). Discovery is different because it holds an index which represents the full text content which may be searched, and also offers a linking facility to open the full text content.

7. Advantages of Discovery Services

- Discovery tools provide access to a large amount of material, of many different types.
- Discovery tools are fast since searching is in local or centralized indexes (even though these are large).
- They focus primarily on electronic full text.
- They are easy to use.

8. Disadvantages of Discovery Services

- Large numbers of many different types of results.
- Difficult to limit results (publication types, population
- Does not make use of database or platform features.
- What do limits and options actually do?
- What is being searched? Is it a full text index, title and abstract or metadata? If the searches are different in different publishers' materials, how does this influence relevance? Does the origin of the material influence relevance?

- To what extent does the Discovery Tool represent everything that the customer subscribes to?

9. Commercial and Open Source Library Resource Discovery Software

In present days many commercial and open source library discovery service software are available in the market. In connect to commercial EBSCO is leading the market while in open source VuFind is having more installation in the various types of libraries in India.

Some of Commercial and Open Source Software are listed below:

Sr. No.	Commercial Software	Open Source Software
	EBSCO Discovery Service (EDS)	VuFind
	ProQuest Summon	Blacklight
	Ex Libris-Primo Central	LibraryFind
	WorldCat Local	Franklin
	Ovid Discovery	SOPAC

10. Implementation of VuFind-Open Source Library Resource Discovery Service at Central Library, Tripura University

About VuFind Discovery Service:

VuFind was developed by Villanova University and was released in July 2010. It is open source software and not affiliated or coupled with any LMS. VuFind is however marketed and supported in the UK by PTFS Europe, primarily as the discovery interface for the Koha LMS. VuFind also uses a Solr index and can index locally sourced metadata from disparate sources, including but not limited to the library catalogue. It presents a simple, Google-like interface with keyword searching. It can also be deployed as an interface layer via APIs to search ProQuest- Summon, EBESCO-EDS or Primo.

VuFind is modular so it is up to the user how many features and functions to implement. Its open source nature allows technically minded users to modify modules or

add new functionality. Over 100 institutions are using or evaluating VuFind. Institutions running live instances include the London School of Economics, the National Library of Ireland, Yale University, Birkbeck College. University of Kent and in India, Central University of Kerala,. VuFind offers limiting by facets including format, call number, language, author, and genre. Other features include suggested resources and searches, browsing, creating lists, texting, e-mailing, tagging, and commenting features, persistent URLs, and multi-language capability. However, as with Blacklight, VuFind cannot index 3rd party data or provide access to databases, full-text articles etc.

VuFind is a library resource portal designed and developed for libraries by libraries. The goal of VuFind is to enable your users to search and browse through all of your library's resources by replacing the traditional OPAC to include:

- ILMS-Catalog Records
- Digital Library Items
- Institutional Repository
- Institutional Bibliography
- E-Books/Online Journals Catalog Records
- Institutions Faculty Publications
- Other Library Collections and Resources

VuFind is completely modular, so you can implement just the basic system or all of the components. Since it's open source, you can modify or add modules to best fit your needs. A wide range of configurable options allow extensive customization without changing any code

Requirements

1. Software

VuFind was developed with the following software packages in mind:

VuFind Version(s)	Apache HTTP Server Version	PHP Version	MySQL Version	Java JDK Version
VuFind 1.x	2.2.12+	5.2.x	4.1+	1.5+
VuFind 2.0-2.3.1	2.2.12+	5.3.3+	5.1.10+	1.7+
VuFind 2.4+	2.2.12+	5.4+	5.1.10+	1.7+

The installation documentation will help guide you through the process of

installing these prerequisites and setting up VuFind on various operating systems. Both Linux and Windows are fully supported.

Hardware

VuFind's hardware requirements vary based on the size and amount of data you are indexing as well as the user load you expect. As a result, it is impossible to give absolute hardware requirements.

For a small index, very basic web server hardware will be sufficient. The bare minimum is probably around 2GB of RAM and a few GBs of disk storage. For huge indexes, you will need more RAM and disk storage, and you may even want to spread the load across multiple servers. The good news is that VuFind is extremely scalable. You can start small and grow the system as needed.

11. Major Features of VuFind Discovery Service

Search with Faceted Results The search system allows for the user to search from a basic search box and then to be able to narrow down the results by clicking on the various facets of the results.

Live Record Status and Location with Ajax Querying The search results page is able to display the live status of a record through the use of AJAX by querying the catalog at that exact moment. And since it is done through AJAX after the results have loaded, the page will not slow down for any reason.

"More Like This" Resource Suggestions When viewing a record, the user will be offered suggestions of resources that are similar to the current resource.

Save Resources to Organized Lists The user has the ability to save the resources from both the search results page and from the record view page to their own customizable lists. The lists can be retrieved at any time and will always be there for the user. This helps to eliminate the need for desktop based citation management software that tends to be too difficult for basic users. This makes it simple for all users!

Browse for Resources The user has the ability to browse the catalog allowing them to explore what the library has rather than only being able to see a very narrow spectrum of results.

Author Biographies The user can learn more about the author with contextual information and see all of the books that they have written in the library.

Persistent URLs Allows the user to bookmark their queries or records to allow permanent access to a page they were once on.

Zotero Compatible Your users can save and tag any records with Zotero or any other COinS based application so they can store their records in one place.

Internationalization The interface has translations available in Brazilian Portuguese, Chinese, Dutch, English, French, German, Japanese, Spanish and more. And if you want to create your own translation - it's easy. You can even create a new English translation if you want to change some of the wording used in the interface - it makes the UI that much easier to customize. **Access Your Data: Open Search, OAI, Solr** VuFind has many APIs to interact with the search, data and many other features. You can syndicate your record data with other institutions via an OAI server. You can search using vufind's algorithms via OpenSearch. And if you want complete access to your indexed data, you can interact with Solr, VuFind's backend search and index engine

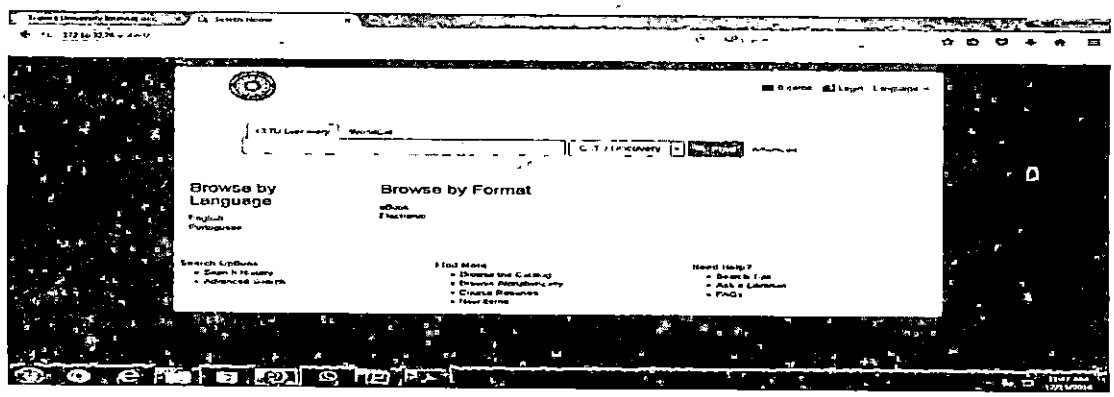


Figure 1. Showing VuFind search interface at Central Library, TU

When I have make a search by giving term "Organic Chemistry" on E-Books library catalogue, it is showing the 220 result from entire database but when I make search by giving same keyword into VuFind Discovery service, it is showing the 330 results from entire e-book databse. So it clear that VuFind is using more powerful search through its Solr index into chapter & content level. This bellow image will make you clear about the VuFind search strategy.

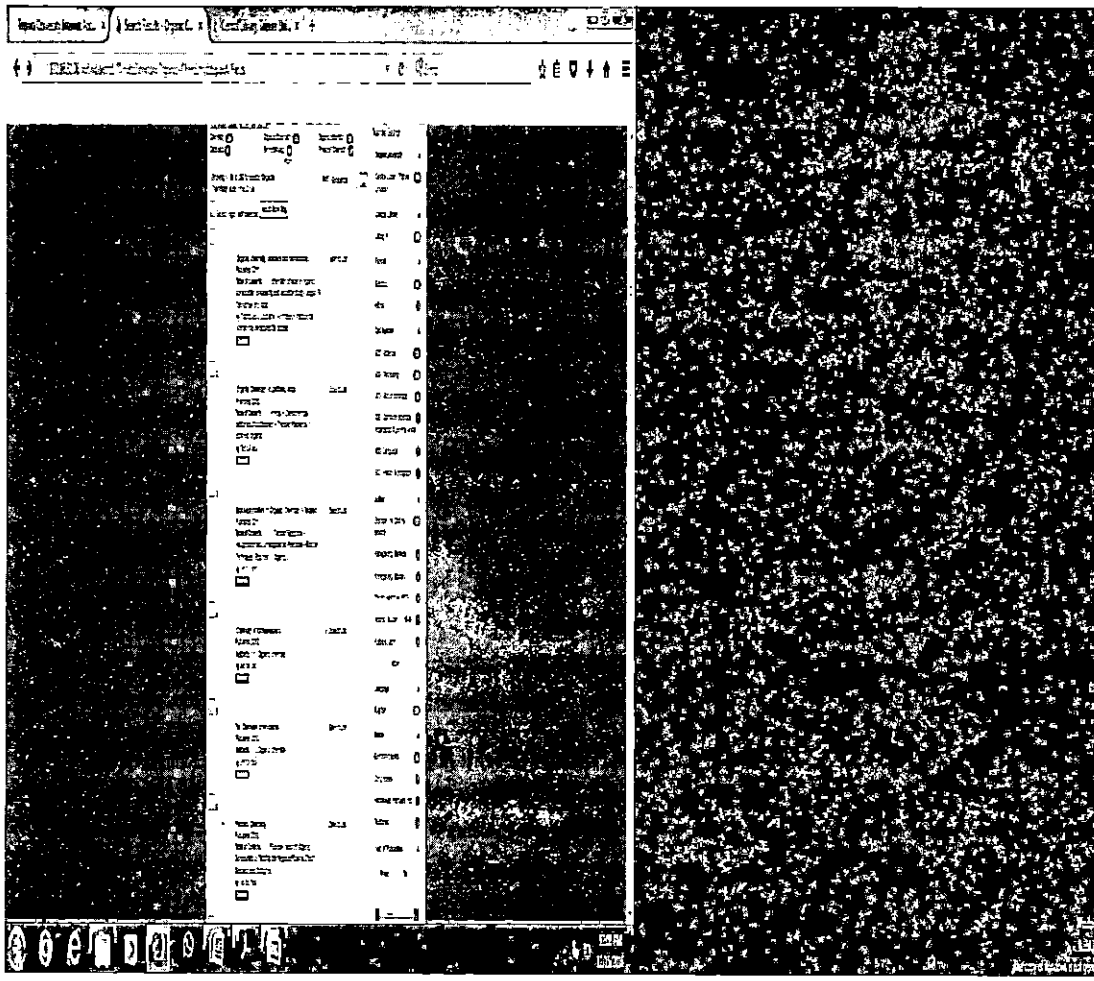


Figure 2. Showing the VuFind search result interface with maximum filter options, Save list of search result, Citation, & Tagging etc.

12. Conclusion:

According to Luther and Kelly, discovery services can be evaluated on content (scope and depth, richness of metadata, frequency of updates), search (simplicity of interface, quality of results etc), fit (ease of implementation, compatibility with existing systems, responsiveness etc of vendor), and cost. Interoperability with the LMS/OPAC is an important consideration in selecting a discovery service.

Absolutely, this technology is a newest into the libraries for all of us. So, it may not be obvious how to do some of the things you have grown accustomed doing with the other

databases. But it's the real fact that due to increase of online & print resources in the libraries, it is very crucial to find out the relevant document for the users. In present day, libraries need to develop the single window search for its all resources, so that users can have a single term search into the entire collection rather searching into various databases. Therefore, I encourage to all library professional to implement the VuFind Open Source Software into your libraries for making the Dr. Ranganathan law 'Save the time of users" true into the real context of the library users.

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USER EDUCATION IN DIGITAL ENVIRONMENT: A CASE STUDY OF S.V. AGRICULTURAL College, REGIONAL LIBRARY, TIRIPATI.

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Abstract: Agricultural science has a number of electronic information products and resources. Every agriculture library must practice the use of those electronic products and services for the better use. User education is the method of guiding the users for optimum use of those resources. A study among the post graduate students and PhD Students of S.V. Agricultural College, Tirupati has been taken up in which it was found that the users are not very much aware of e-Resources and there is a necessity to conduct user education programme among the user groups specifically among students.

Keywords : User Education, Digital Environment, Orientation, E-Resources.

1. INTRODUCTION

There has been a great paradigm shift from stand alone libraries to networked electronic or digital libraries Today, as information resources are increasingly becoming digitalization libraries are focusing on e-Resources and automating their activities, developing databases, procuring more and more e-Resources and providing web based information in remote locations across the world the relevant these changes has not only become more important but also mandatory in the present information scenario. The Students of PG and PhD level mostly depending upon e-Resources and online information sources. But how far it benefitted the student and how far they are able to get their required information independently in digital environment is a matter of study for the librarians

2. ABOUT S.V. AGRICULTURAL COLLEGE, TIRUPATI

The S.V Agricultural College was established in 27-10-1961 . Although the university came into existence on August 21 1964, a journey into the broad-lands of history reveals it to be a much older institution. It would perhaps not be an exaggeration to say that the university was conceived way back in 1899 in the form of an experimental farm of 30 acres. Following this, an agricultural college was established in 1961 and the farm itself occupied 202 acres. In fact today this very farm constitutes the Main Research Station of the university. Such were the humble beginnings that the university,

as it stands today, is a tribute to the visionaries who founded it and those who nurtured it over the past several decades.

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About S.V. Agricultural College, Regional Library, Tirupati

Institutions of higher education have the main responsibilities of equipping students, researchers and faculty with advanced knowledge and skills. A well equipped and managed library is an essential prerequisite to achieve this. In particular, scientific research needs a library as well as its laboratories. Keeping this in view, the Regional Library undertakes many responsibilities and performs varied functions and it plays a vital role in the university education and research by providing invaluable resource of knowledge.

S.V. Agricultural College Library was started functioning from 07-8-1963. At the beginning 533 books were purchased by several Departments of College, formed part of the Library and some books were transferred from Agricultural College, Bapatla for immediate use by the students and staff. With the formation of APAU in 1964 the library has grow in leaps and bounds. Accordingly the libraries of S.V. Agricultural College and College of Veterinary Science were merged together on 11-08-1982 raising the library holdings to 34,488 and now separated into S.V. Veterinary University library and ANGRAU Regional Library in the year 2007. It has now grown to 32,196 volumes.

The Regional Library moved into its own functional building at S.V. Agricultural College in the year 2007. The Regional Library is kept open for 11 hours on working days and for limited hours on public holidays and Sundays. Students and staff of the College can become the members of the Library, whereas bonafide outsiders who come with the introductory letters from their institutions/ ID card provided by our University Library are permitted for consultation only.

The Library has created a database of Books, Journals, Thesis, Reports and Reference sources and it's made available through 'OPAC'. The library has also created databases of current periodicals, CD's, on-line Journals subscribed and digitized database of Theses available in the Library. It also has contributed to the project Strengthening of Digital Library and Information Management under NARS (e-Granth) by setting up a work station for digitization of old resources prior to 1960, which is housed in the library building. Recently library has implemented KOHA Library Management System. The library has implemented and will adopting new technologies to keep pace with the growing information needs of the community to provide better information services.

3. LITERATURE REVIEW

Hooks, et al. (2007), remark that, "teaching students how to use the university library resources had been a challenge for academic librarians for most of the twentieth century and has emerged as a high priority for academic librarians in the twenty-first century as well." Alimohammadi and Sajjadi (2006) add that, "library and information professionals have experienced the information seeking challenges of newcomers for many years, and have planned a wide range of instructional programmes to tackle this problem." User education provides a platform where librarians introduce new students to the complexities of university library facilities; familiarize users, who have little or no information seeking skills at all with a broad range of library resources in order to develop library skills; and educate them on how to find materials using library catalogues, subject indexes, CD-ROMs, and the Internet.

The American Library Association (1989, p. 2) defines user education as encompassing all types of activities designed to teach users about library services, facilities and organization, library resources, and search strategies. A survey of the literature reveals the importance of user education in academic libraries. It is believed that improving user's skills in exploiting library resources and services can lead to greater use of the library. According to Behrens (1993), library skills include using the catalogue and other bibliographic tools, selecting information from these resources, and physically locating them on the shelves. According to Gericke (1996), user education refers to teaching the use of libraries and information sources. It includes instruction in the use of one or more reference sources as a part of reference transactions, library use presentations, and bibliographic instruction.

Mews (1992) describes a process of broad and continuous user education that is an integral part of student learning. Ford (1994) describes the situation in South Africa, Australia, and the Netherlands, where information literacy has become part of the secondary and tertiary curriculum, and the importance of information literacy to development of individuals and societies. Foss (1994) argues for user education at all levels, beginning through advanced.

Today's students need computer literacy as a part of information literacy. Doherty, et al., (1999) discuss the problems presented by many choices and a lack of stable standards. Wooliscroft (1997, p. 7) defines "information literacy" as "the ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand." Wood (1984) finds user education valuable in orienting students to the world of scholarship.

4. USER EDUCATION IN AGRICULTURAL UNIVERSITY

The Libraries and Information Centres of the Agricultural Colleges and research institutes have been acting as a nerve center by providing valuable information catering to the information needs of the agricultural stake holders. They have been playing an important role in supporting education, Research and extension activities of their Universities. As Libraries are going hi-tech with the use of information and communication technologies, agricultural libraries in India are focusing hard to improve their information services through ICT applications. ICAR has taken vibrant steps in improving the information and communication dissemination process to a number of digitization projects. Krishiprabha initiated to digitize the PhD thesis in Agricultural Universities in India. The consortium of e-Resources in Agriculture CeRA - JGATE has been made a country vide operation among the Agricultural Libraries to access and use the e-journals in Agricultural and allied subjects. E-portal in Agricultural subjects has also been developed to use the syllabus and course contents by the students and teachers. In view of this situation, there is a need for educating the users to use those resources in ICT environment.

5. STATEMENT OF THE PROBLEM

The S.V. Agricultural College is the 2nd oldest Agricultural College in Andhra Pradesh and has done a dynamic role in imparting agriculture education for the state in particular and the country in general. The library has got KOHA Software for automation. It has subscribed to different types CD- ROMS Databases and developed a networking. The digital Library has been functioning with 35 computers providing the various types of internet services. The library is a partner consortium of e-Resources in Agriculture, Krishi Prabha and e-Granth, Nisagenet Projects. In this scenario how the users are exposed to the new e-Resources is the crux of the problems. This study has been conducted to know level of awareness among the users, relating to various types, forms and sources of information and how use them. Because in order to improve the services and functioning of the Regional Library and provide services upto the entire satisfaction of the user community. It is essential to know their exposure and access to those technologies.

6. OBJECTIVES OF THE STUDY

This study is made to find out the status of user education in the proposed library setting and to suggest some required measures.

However, the study sets forth the following objectives.

1. To Know the need for user education programme for the Agriculture education of the College.
2. To find out the awareness of the users on the e-Resources and to make the effective utilization of such materials inside the library.
3. To identified the level of user education on e-Application.
4. To access the awareness online databases in Agriculture
5. To identified the use of Agricultural Information systems and services developed by ICAR
6. To find out the usefulness of user education programme under taken by the library

7. METHODOLOGY

The survey method was adopted for collection of data, a structured questionnaire was made for purpose which was administrated. This method facilitated the accumulation of information from respondents in various settings under parameters relevant for the study. The basic purpose this investigation is to determine the need for user education for the PG and PhD students in S.V. Agricultural College Libraries.

Data Analysis and Interpretation

A Total number of 110 P.G. PhD students were selected randomly for sample survey. Those students who personally visited e-Library section of S.V. Agricultural College, Library were distributed questionnaires, and asked to fill up the questionnaires through personal request, several verbal requests and frequent personals visits. A Total of 84 students out of 110 students submitted their filled questionnaires.

Table No.1

S. No.	Category	N	Percentage
1	P.G.	54	64.3%
2	PhD	30	35.7%
3	Total	84	100%

The table no. 1 revels that the students from the P.G. occupy the highest 54 (64.3%) followed by the PhD students with 30 (35.7%). Hence the P.G. Studetns in Agriculture are most interested in taking part of the study.

8. AWARENESS AND USE OF ELECTRONIC DATABASE

A question on electronic database was included in questionnaire to know if the P.G. and PhD students are using it or not. The data collected are given in the below table.

Awareness and use of Electronic Database

Table No.2

S. No.	Electronic Databases	Students (P.G. and PhD)	N (84)	Percentage
1	Knowledge and use of Bibliographical databases in electronic form	Yes No	20 64	23.8% 76.2%
2	Knowledge and use full text electronic databases	Yes No	28 56	33.3% 66.7%

The Table No.2 shows that 76.2% students are not knowing and using electronic bibliographical databases and 23.8% are using it. But when they were asked about knowing full text electronic databases the result disheartening. Why only 33.3% respondents are knowing and using the full text electronic databases the majority of 66.7% are not knowing and not using such resources. This is not a healthy climate in the electronic information environment.

AWARENESS OF DIFFERENT TYPES OF E-RESOURCES

To find out student's awareness of different types of e-Resources a question was added in the questionnaire and the responses of students are presented in Table – 3.

Awareness of Different Types of e-Resources

Table No. 3

S. No.	E-Resources	Students (P.G. and PhD) (N=84)	Percentage
1	e-Journals	49	58.3%
2	e-Books	42	50%
3	e-Thesis and Dissertation	28	23.5%

4	e-Articles	32	38.1%
5	e-Databases	18	21.4%
6	e-News Papers	52	61.9%

The Table No. 3 shows the awareness of different types of e-Resources available in Agriculture sector. While the knowledge of e-newspapers is attributed in the highest of 61.9% followed by e-databases. Others e-resources such as e-journals e-books and e-articles are attributed to 58.3% 50%, 38.1% respectively. It is found that the level of awareness of electronic resources by the students of the college is not very applicable.

9. AWARENESS AND USE OF OPEN ACCESS JOURNALS

The respondents were asked to state their awareness and use of agricultural based open access journals, through CeRA. The views of the respondents are revealed in Table No.4

AWARENESS AND USE OF OPEN ACCESS JOURNALS

Table No. 4

S. No.	Online Journals	Respondents (N=84)	Pecentage
1	Agricultural Research	18	21.4%
2	Agro Pedology	16	19.4%
3	Biomass and Biotechnology	10	11.9%
4	Cell	12	14.3%
5	Entomology	8	9.5%
6	Floriculture	6	7.1%
7	Soil Science	7	8.3%
8	Genetics	11	13.1%
9	Ephytica	5	5.9%
10	Research Horizons	4	4.7%

The above table showing the results it is very disheartening to not that the awareness and use of the open access online journals by the students is not at all satisfaction. Atleast 10 open access journals were selected to judged by the students to ascertain their awareness. The response received is very negligible

and no open access journal is access to have been used by not more than 22% of the respondents. This is a matted serious concern because those open access online journals are totally free of cost and anybody can have access and use the matter for their study.

AWARENESS AND USE OF ONLINE DATABASES

Table No.5

S. No.	Online Databases	Respondents (N=84)	Percentage
1	J-Gate	62	73.8%
2	CRC Net based e-Books	30	35.7%
3	CAB Abstracts	18	21.4%
4	Biosis	10	11.9%
5	Agri C.D	8	9.5%
6	India Stat.	14	16.6%
7	Ezproxy	6	7.1%

The Table No.5 revealed that the students were awareness on J-Gate 73.8% , CRC Net based e-Books 35.7%, CAB Abstracts 21.4%, Biosis 11.9%, Agri C.D. 9.5%, India Stat. 16.6%, Ezproxy 7.1% Awareness and use all other online databases is very negligible. The shows that the students need user education for those electronic information resources.

AWARENESS AND USE OF E-CONSORTIA DIGITAL LIBRARY PROJECTS

Use of E-Consortia Digital Library Projects

Table No. 6

S. No.	Use of E-Consortia Digital Library Projects	Respondents (N=84)	Percentage
1	CeRA	44	52.3%
2	E-Granth Projects	2	2.3%
3	Krishi Prabha	10	11.9%
4	Krishi Kosh	6	7.1%
5	Agricat	5	5.9%

The above table reveals to find out how many students aware and use the e-Resources and Digital Library Projects developed and provided by the Library. The table No. 6

Reflects that CeRA 52.3% Respondents are aware and use CeRA only 2.3% of students are aware of e-granth projects, 11.9% students were aware of Krishi Prabha, 7.1% of Students were aware of Krishi Kosh and only 5.9% Students were aware of Agricat. This data shows that more orientation classes and user education programmes are needed for the students on digital Library e-Resources.

STUDENTS ATTENDING THE AWARENESS PROGRAMME ON E-RESOURCES PROGRAMME

Attending the Awareness Programme on E-Resources Programme

Table No. 7

Attending the Awareness Programme on E-Resources Programme	Respondents (N=84)	Percentage
Yes	36	42.8%
No	48	57.2%

It is evident from the Table No.7 that only 42.8% respondents have attended the awareness programme on the use of E-Resources and 57.2% of students haven't attended due to any reason. It shows that they required more orientation classes.

Need for User Education Programme

Table No.8

Need for User Education Programme	Respondents (N=84)	Percentage
Yes	70	83..4%
No	14	16.6%

A Question was put to identify whether the post graduate students need continuous user education programme for their proper awareness and effective use of those electronic information resources. The result is depicted in the Table 9 which reflects that 83.4% respondents opined for continuous user education programme to be conducted by the library professionals, but only 16.6%are not in favour of such a user education programme.

10. SUGGESTIONS

1. Since many ICT technologies have been introduced and adopted in library profession, academic librarians involved in the teaching of user education should undergo training on E-learning periodically
2. More workstations should be installed so that as many students as possible could benefit from the practicum
3. Library expenditure should be provided for by respective university administrations
4. A Method of evaluating the course lecturers by asking the students to access teaching methods and capability of the academic Librarian in delivering the lectures, cn also be adopted.

11. CONCLUSION

In the era of digital technologies the need of user education appears to be very essential. Because the use of Information in Libraries in maintaining the housekeeping operations and information handling activities has brought about vast changes. Users are to be educated to effectively use those technologies for their study and research. Both library staff and users recognize the user education is necessary in libraries. Libraries encouraging a positive attitude towards the library offers a positive attitude that its students are the keys to success effort patience and enthusiasm all students can be provided with the skills required for effective, efficient independent library use. A effective and transparent user education programme need to be developed which should make a lasting impact on the possible solution in developing a good user education for an Agricultural Colleges.

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Virtual Learning Environment for LIS Education

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Abstract: Due to emergence of new technologies in information and communication field, the teaching, learning and curriculum in every discipline is changing over a period of time .The new Information and Communication Technology (ICT) components need to be introduced in the curriculum of LIS while revising the syllabus. Inclusion of ICT components in the course curriculum of LIS has made a great impact on the teaching as well as learning process because the ICT components in curriculum enables creation of virtual learning environment in LIS departments. A brief review of the required virtual learning environment and teaching learning interactions are taken into consideration in the present research paper.

Keywords: LIS Education, Virtual Learning Environment, ICT in Education, Teaching, Learning.

1. Introduction:

The technological advancements in teaching and learning have been more rapid. Each new technology can be used effectively and efficiently in the process of teaching and learning. Interaction between the teacher and student is important than one way delivery of lecture by teachers. Information and Communication Technologies are essential for curriculum support as well as teaching-learning process. It has the capability of being a source of knowledge, as a means to access information, as a medium to transfer electronically the contents as also as a means of interaction and communication. ICT is both a cause for change as well as a means to manage the change in LIS education.

Murahari and Kumar have stated that "our educational sector must use a variety of new technologies to replace or supplement the classroom teaching. The technologies include use of computers, IT, audio and video conferencing, computer conferencing, network, Internet and MM in teaching for all levels of education. While these technologies can be used to reach geographically dispersed student, minimum attention is being paid to the effectiveness of each and a combination of technologies for education. Its potential for flexible education delivery, scope for self and lifelong learning and cost

effectiveness make IT instrument in meeting the needs of individual and communities at this juncture – in the rapid transition being made from the industrial to the information age." **(Murahari & Kumar, 2008).**Thus, if the class room teaching is provided through well developed smart class rooms supported by internet based resources and facilities with trained manpower, it certainly improves effectiveness of education.

2. Need for Creating Virtual Learning Environment for LIS Education:

There are various tools of ICT that support teaching and learning in LIS education. These tools include video-conferencing system, M-learning, digital libraries, web-based electronic sources, internet, satellites and wireless technologies etc. The various technologies that are useful for teaching and learning include educational management system, educational animation, blogs, classroom response system, collaborative software, e-mail, e-portfolios, computer aided assessment, discussion boards, electronic performance support system, hypermedia, PDA's, podcasts, MP3 Players with multimedia capabilities, virtual classroom, web-based teaching materials, websites and web 2.0 communities, wiki, YouTube, RSS Feed, multimedia CD-ROMs, Google Scholar, cloud based education, use of e-learning softwares, social networks and virtual learning environment etc. These tools help the teachers and the students to collect, store and disseminate information. These new technologies have been accepted for faster development and growth of LIS education also. The ICT resources influence the contents of the LIS curriculum and can also be used to deliver the contents of the curriculum.

ICT also plays a crucial role in teachers life whereby on one hand, they enrich their knowledge by getting required information and on the other hand by delivering the lectures supported by quick references and updates in their concerned subject field.

Mishra Rajendra, has described the use of Information and Communication Technologies (ICTs) in various fields. Apart from the learning and teaching in more interesting way, he opined that the ICTs provide opportunity to the teacher to gain information. Through the integration of these, communication becomes more in various countries as one of the basic thing to make teaching and learning more interesting. At the same time, ICTs also provide challenges to teachers and students in terms of using subject specific ICT resources for each others understanding with various kinds of activities .With the help of variety of real time, by the teacher while using ICTs, information and communication technology provides more interactive and less didactic approach, where the class can interact with the content and contrast of the lessons digitally through the ability to capture, combine and manipulate information from a variety of sources." **(Mishra, 2008)** Thus, a communication technology helps to make

interactions among teachers and students without considering geographical boundaries with more enthusiasm.LIS education has also immense capabilities for sharing theoretical knowledge as well as performing practices through ICT which has created more challenges and opportunities for both LIS teachers and students.

There is a widespread understanding amongst all the educationists about use of ICT in teaching and learning to ensure that the teachers are well equipped to use technology for teaching as well as learning through technology. Both teaching and learning are interconnected and interrelated with each other. The teaching and learning in LIS are also being greatly affected because of use of ICT in the management of libraries and information services, library methods and techniques as well as various ICT enhanced processes that deal with selection, acquisition, storage, preservation, retrieval and dissemination of information. So, LIS students need to be taught about ICT to keep themselves abreast of latest technological advancements in managing the libraries and information centers. This situation calls for creating virtual learning environment in LIS departments .

3. Impact of Virtual Learning Environment for LIS Education:

Creating virtual learning environment for LIS education is at top priority for making LIS teaching and learning more interesting. It helps to face challenges posed by ICT application in LIS curriculum and education. The digital information resources useful for LIS education can be exploited by making the class more interactive. Thus, ICT has brought new possibilities into the classroom. The use of ICT has made revolutionary change in the teaching, learning and on LIS curriculum. Zayapragassarazan and Ramganesh have suggested "two ways through which substantial changes in both teaching and learning can be made by use of ICT. Firstly, the rich representation of information changes learners' perception and understanding of the contest. Secondly, the vast distribution and easy access to information can change relationships between teachers and learner." **(Zayapragassarazan & Ramganesh, 2008)** Thus, information representation, its wide distribution and easy access helps to improve the overall performance of the learner which is possible by existence of virtual environment in LIS departments.

One of the most relevant outcomes of the virtual learning environment in LIS education is the introduction of the communication network and Internet. Development of LIS teachers and students is possible through virtual learning environment. A blending of specific skills, content knowledge, expertise and literacy with innovative support systems helps LIS student to master abilities to develop modern libraries. Virtual learning environment is help-

ful for developing the skills, knowledge and expertise of LIS students with certain outcomes.

The free and open source softwares have added a new dimension to LIS education. With the help of these softwares, one can develop, release and modify any teaching based activity free of cost. One can make use of Moodle, MOOCs, Eliademy, eFront, Dokeos, Claroline, ATutor and ILIAS for crating E-learning environment for LIS education. These softwares are helpful for the administration, documentation, conducting training programmes, effective implementation of classroom and online events, e-learning programs and training contents.

There is also increased workload on LIS teachers in ever changing LIS education and there is a challenge to maintain the quality of lectures delivered by LIS teachers. In this respect, Seetharama et al. are opined that, "..... the versatility and power of Information Technology which include accommodation of increase workload, achievement of greater efficiency in improving existing services, ability for generation of new services, facilitating co- operation and in providing for an integrated approach without regard to format, location or medium through which it is served, which can light heartedly be called "one-stop information shopping" , can stand in good stead in the quest for quality and productivity in information services and products"**(Seetharama et al., 2006).**This is to be considered on priority basis while thinking about LIS education which trains the LIS students to make them capable when they enter into the new spectrum of working librarianship.

The new emerging technology called 'Cloud Computing' and its application to LIS education is also useful for creating virtual learning environment. It can provide a strong base for more effective approach that would furnish the basis for e-mail, personal file storage, and productivity applications like word processing, spreadsheets, databases, and presentation software.

Cloud computing can be used effectively for establishing virtual computer and learning laboratories for supporting LIS education. It is essential in the context of ICT enhanced LIS education for following reasons:

a) Firstly, Provision of access to the cloud infrastructure especially Software as a Service (SaaS), Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Communication as a Service (CaaS) for the purpose of teaching and learning is a remedy for the personnel problem of the course. With the help of these cloud based services, LIS education can provide appropriate and ICT enhanced LIS education and training.

b) Secondly, Cloud computing offers tremendous opportunities for getting direct hands on experience for making use of various systems. It includes digital repositories, content Management System, web –based links, on-line publishing system, learning management systems, digital archiving, integrated online library systems etc. Open access operating systems and its applications may also help LIS students to work extensively with many such systems. It also offers possibilities for collaboration and resource sharing. The course designers can build systems to meet the requirements of specific courses with the help of Cloud based ICT Laboratories in LIS departments. The collaborative technologies offered by cloud computing can provide LIS departments array of resources available for teaching and learning and also provide shared access to them.

With Virtual learning environment in LIS departments, it is possible to lay more emphasis on teaching of new aspects inclusive of technological trends and modern topics with hand on practice about various aspects of library automation and technology based services. The corresponding shifts in the way the LIS knowledge is the result of virtual learning environment suitable for LIS education.

4. Conclusion:

The coupling of information resources, systems and expertise can effectively be supported by infusing ICT across the LIS curriculum if the virtual learning environment is available in LIS departments. If the LIS professionals have to become information facilitators and providers with a variety of knowledge and skills, it is possible through virtual learning environment . Infusing basic computer skills , word processing , file management , Disk management networking , Key boarding , Database and Internet searching ,scanning , e-mail, voice-conferencing, web page creation and editing , client- server management across the LIS curriculum will help the LIS students to perform all the functions of libraries effectively and all this is greatly facilitated by virtual learning environment. It enables more hands on practice on computers. Therefore, more emphasis on ICT theory and practices in LIS curricula will make the LIS students more confident. LIS department with all emerging new media, training for LIS students in all respects becomes possible. The balance between all components of LIS subjects and the components of ICT that directly relates with each other can effectively be implemented in virtual learning environment only.

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