DYNAMICS OF LIBRARY COLLECTION DEVELOPMENT TO CONTENT MANAGEMENT

Festsscrift in honour of
P R O F. B. K. C H O U D H U R Y
Former Professor and Head, DLIS, Sambalpur University, Odisha

E D I T O R S
Prof. B. Ramesh Babu
Dr. Prangya Das

International VSRD
J O U R N A L S

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FOREWORD

It gives me immense pleasure to write foreword to the Festschrift volume of my dear friend and a lovable colleague Prof. B.K.C. It's a pleasant and satisfying assignment to share my heartfelt views on the concerted effort of the team. There are very few leading teachers in India who have been honoured befittingly for their devotion and dedication to teaching and research. Prof. B.K.C. is one among those few, who has won the admiration of his friends and students.

*The theme of the felicitation volume **'Dynamics of Library Collection Development to Content Management'** truly reflects the different phases of expertise and in-depth research endeavors, shared by Prof. B.K.C. in one context or the other. The contributions are thoughtfully classified and grouped under five distinct headings. The entire career of Prof. B.K.C. has been proactive, productive and persuasive. The output, both in terms of quality of papers/ articles as well as in terms of research scholars is laudable. His cordial nature and consideration for serious learners attracted many active researchers who are now holding important positions at national level in LIS. The authors, who have contributed to this volume, are great admirers of Prof. B.K.C. They have thoughtfully consolidated and presented their research ideas in their papers. These papers will add value to the existing treasure of knowledge. I strongly believe that felicitation volumes can enrich LIS literature, provided the young professionals and researchers read these felicitation volumes. It is needless to say that our teaching faculty should take pride in sharing with their students, the significance and usefulness of felicitation volumes brought out in honour of experts in the field. This will go a long way in promoting the use of new ideas and concepts as well as projecting the personality of the experts and their contributions. Research activity is a collaborative activity. Collective wisdom counts a lot in the growth and expansion of the subject field. In this context, this felicitation volume has bought to the forefront many of the hidden ideas as experienced and explored by the researchers.*

In the final section of the felicitation volume, expression of friends, admirers and research scholars' feelings and respect towards Prof. B.K.C. are covered. Many of the authors have honestly and affectionately opened up their hearts and shared their genuine feelings about the life and achievements of Prof. B.K.C. There are some reflections which are revealing the unknown and unheard stories of Prof. B.K.C. and his struggle in life to reach the highest academic position. The experiences of the research scholars and students as expressed in their write-ups, also reflects how impressionable Prof. B.K.C. has been on the minds and hearts of us all.

I appreciate the focused and dedicated efforts of all the members of the

editorial committee for their futuristic outlook and professional commitment which they have presented by compiling the life achievements of Prof B.K.C. in the form of felicitation volume and making it available to the larger professional circle. My deepest appreciation, to Prof. B. Ramesh Babu and Dr. Prangya Das, for doing the marvelous job of editing this volume systematically.

*✍ **Prof. C.R. Karisiddappa***
Visiting Professor
Professor and Chairman, DLIS (Retd.)
Former UGC –Emeritus Professor
Karnatak University, Dharwad

P R E F A C E

*The present volume entitled as **"Dynamics of Library Collection Development to Content Management"** is a compilation of research papers brought out in honour of **Prof. B.K. Choudhury**, former Professor and Head, Department of Library and Information Science, Sambalpur University who retired from the services during 2008. Prof. B.K. Choudhury served as Professor, Head and Coordinator, UGC DRS SAP, Department of Library and Information Science (LIS), Sambalpur University, Odisha. He obtained B.Lib.Sc. in 1971 from Jadavpur and M.Lib.Sc, in 1979 Karnatak Universities with first class. Besides, he possesses M.A., and Diploma-in-Russian Language from Utkal University, Bhubaneswar. He is a distinguished and dedicated teacher and researcher. He has more than three decades of teaching and practicing experience. He started his career in Central Library, Orissa University of Agriculture & Technology, Bhubaneswar from 1971-1983. Later served as part time lecturer in Utkal University from 1982-1985.Thereafter being selected by Orissa State Public Service Commission joined as a Lecturer in S.B. Women's College, Cuttack from 1983-1988. Subsequently joined as Lecturer in Sambalpur University in 1988 and become Reader and Professor and superannuated in November 2008. After retirement, worked as UGC Visiting Professor in Utkal University for the sessions 2009-10 and 2011-12. To his credit 13 Scholars from different parts of India have been awarded Ph.D in LIS and 4 Candidates have submitted Ph.D Theses & 4 are now pursuing under his guidance. He is a recognized Ph.D. guide in Bhavnagar University, B.R.Ambedkar University, Agra, Sambalpur University and Utkal University. He has authored 4 books and edited 3 books. He has published about 70 papers in international and national journals, edited volumes, festschrifts, seminars and conference proceedings. He has also prepared course materials for IGNOU, NCERT, Kurukshetra University, Andhra University, G.G University, Nagarjuna University, Dr. H.S. Gaur University, and Sambalpur University for MLIS and E-Pathasala, a project of UGC. He has also completed one Minor research project on, "Collection Development Program of Sambalpur University: An evaluation". He was associated with more than 30 universities as Member Selection Committee, Visiting fellow, Resource person, member of academic bodies and Ph.D. examiner etc. He has served in the national and international conferences as Director and resource person, Key Note Speaker, Chairperson and Rapporteur general.*

Keeping in view of the academic contributions of Prof. B K Choudhury to the field of LIS, we the close friends, research scholars and professional colleagues desired to honour him with a festschrift. The articles have been collected by a word- of - mouth among the LIS professionals spontaneously.

Electronic technologies and collection development are two of the top concerns in Library and Information Science today. On this broad perspective

a total of 47 articles have been received from different parts of the country. Editors whole heartedly thank Prof. B.K. Choudhury for allowing us to bring out this felicitation volume. The articles in the festschrift have been grouped as follows:

Section I   Collection Development
Section II   ICT and Content Management
Section III   Information Services
Section IV   Information Management
Section V   Information Needs and User Education
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The Editors thank and congratulate all the contributors who have responded spontaneously by contributing the articles. Contributors to this Festschrift are by renowned faculty and practicing LIS professionals. Views expressed in these contributions are of the respective authors only and the Editors are no way responsible for the thought content of the articles.

Our special thanks and respects to Prof. C R Karisiddappa, former Professor and Chairman, Karnatak University, Dharwad and a distinguished LIS professional for his readily accepting my personal request to write FOREWORD, The Editors are sure that the volume would be a valuable addition and contribute to the growth of LIS literature.

*The production and publication of this volume in a record time with quality get up is due to the tireless efforts of **VSRD International Journals** (A Research Division of Visual Soft India Pvt. Ltd.), who is one of the leading publishers of LIS publications. We the Fellow professionals wish Prof. B.K. Choudhury with a sound health, long and peaceful life for many more professional contributions.*

We Pray Lord Almighty to bestow divine showers on him and his family!

Editors

*✍ **Prof. B Ramesh Babu***

*✍ **Dr. Prangya Das***

Prof. B.K. Choudhury

Prof. B.K. Choudhury was a former Professor, Head, Coordinator, UGC_DRS_SAP, Autonomous Dept. of Library & Information Science, Sambalpur University, Odisha.

Dr. Choudhury passed B.Sc. from B.J.B College in 1968 & obtained B.LiB.Sc & M.LiB.Sc. Degree from Jadavpur and Karnataka University in 1st class in 1971 & 1979 respectively. He also possess M.A. & Diploma-in-Russian Language from Utkal University, Bhubaneswar.

He is a distinguished, eminent and excellent teacher and a superb researcher. He has a long 31 years of teaching experience. He began his career in Central Library, Orissa University of Agriculture & Technology, Bhubaneswar from 1971 and continued till1983.

Joined as Part Time Lecturer in Department of Library & Information Science, Utkal University from 1982-1985.Thereafter being selected by Orissa Public Service Commission appointed as a Lecturer in Lib. Sc. in S.B. Women's College, Cuttack from 1983-1988.

There after appointed as Lecturer in Department of Library & Information Science, Sambalpur University in 1988 and subsequently became Reader and Professor and superannuated in Nov. 2008. Joined as UGC Visiting Professor in DLISc. Utkal University for the session 2009-10 and 2011-12. Prof. Choudhury has 27 years of Research Experience. To his credit 16 Scholars from different parts of the country have been awarded Ph.D. in LIS and 1 Candidate has submitted Ph.D. Theses & another 5 are now pursuing research under his guidance. He is a recognized Ph.D. Guide in Bhavnager University, Gujarat, B.R. Ambedkar University, Agra, Sambalpur and Utkal University.

He has authored 3 books and edited 3 books. Published 70 papers in International and National Journals, Seminars and Conference Proceedings.

Prepared Course Materials & Modules for IGNOU, NCERT, and Kurukshetra University, School of Distance Education, Andhra University, G.G University, Nagarjuna University, Dr.H.S. Gaur University, Sambalpur University and for M.Lib. Sc. for E-Pathasala, a prestigious Project of UGC & MHRD, New Delhi. He has also completed one Minor Research Project on, "Collection Development Program of Sambalpur university: An evaluation".

Associated with more than 30 Universities, namely Universities of Andhra, BAMU Aurangabad, BHU, Berhampur, Utkal University, North Orissa University Madaras, Vidyasagar, Karnatak, Nagpur, Osmania, Mizoram, NEHU, Calcutta, GNDU, Punjab as member, Selection Committee, Visiting Fellow, Resource Person, Member of Academic Bodies and Ph.D. examiner etc. Organised National and International conferences as Director and acted as Resource person, Key Note Speaker, Chairperson and Rapporteur General, Guest of Honour and Chief Guest.

Brief Profile of the Editor

*Dr. B. Ramesh Babu was **Professor** in the Department of Library and Information Science, University of Madras and former Visiting Professor at the **Mahasarakham University, Thailand (2012-13).** He has been awarded **Dr. S.R. Ranganathan Memorial Gold Medal** from the University of Mysore for the First Rank in M. Lib. Sc., degree. He has been awarded **Commonwealth Fellowship for Post-Doctoral research** for the year 1999/2000 and worked on "Web OPACs in the UK Academic Libraries" at the Department of Information Science, Loughborough University, **United Kingdom.** He has also visited France, Nepal, Muscat, Thailand, Laos, Bangladesh, Germany and South Korea on academic invitation. He has been awarded **C. D. Sharma Best Paper Award** by the Indian Library Association for the Year 1999 and **READIT 2001 Best Paper Award** by the IIT, Madras, IGCAR and MALA at the National Conferences. He has also been conferred **Prof. Parvathaneni Gangadhara Rao Memorial Award for 2007** by the Potti Sreeramulu Telugu University, Hyderabad for the significant contributions in the field of Library and Information Science. He has also been conferred the **Best Teacher and Researcher Award by the National Association of Indian libraries (NAIL) for the year 2008**. He has been awarded **IATLIS-MOTIWALE Best LIS Teacher Award for 2011** by the Indian Association of Teachers of Library and Information Science (IATLIS). He has also been conferred with **Best Reviewer award** from **JISTaP, journal** published by **Korean Institute of Science and Technology Information (KISTI)** from **South Korea for 2013. Twenty eight candidates were awarded Ph. D degree** under his guidance. He has published more than **360 research papers** in Indian and Foreign journals, Festschrift volumes and National and International seminars/workshops on various aspects of Library and Information Science. He has edited about 27 books including conference proceedings and festschrifts. He has organized a number of workshops, seminars and conferences. He is a **Resource person** in various **Distance Education Institutes** and prepared course materials and delivered lectures. He has delivered **Guest Lectures** in a number of Universities and Academic Staff Colleges in Andhra Pradesh, Tamilnadu, Kerala, Karnataka, Maharashtra, Madhya Pradesh, Pondicherry and Orissa States. He has served as UGC Visiting Fellow of Sambalpur University (One time), Dr. B. R Ambedkar Marathwada University (Four times) and Andhra University (Two times). He is the **Life Member** in ILA, IASLIC, IATLIS, MALA, APLA, ALSD, FIC, MULISSANet, and TLA. He served as **Treasurer, Joint Secretary and Regional Secretary** for*

*IATLIS, **Council Member** for ILA, Vice-**President** of TLA, and President of FIC. Currently serving as **Trustee** for Prof. P. N. Kaula Endowment for Library and Information Science. He has been honoured with two festschrifts, one in four volumes entitled **"Dynamics of Librarianship in the Knowledge Society",** and one volume entitled**, Facets of Librarianship: Yesterday, Today and Tomorrow,** a collection of his reprints. He served as the member of Board of studies in about twenty universities, member of Board of Examiner in about 40 universities both in India and abroad.*

Brief Profile of the Editor

Dr. Prangya Das, Librarian and Head, Central Library Institute of Technical Education (ITER), Siksha O Anusandhan University has been in the library profession since twenty years in different capacities. Dr. Das is Master in Library & Information Science, Ph.D. in Library & Information Science from Dr. B.R. Ambedkar University, Agra, PGDLAN from Sambalpur University. She has published more than 30 papers in National & International journals and conference proceedings. She has organized workshops, seminars and also acted as Rapporteur in different National Conferences.

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Section I
COLLECTION DEVELOPMENT

COLLECTION DEVELOPMENT
FOR
ACADEMIC LIBRARY IN THE DIGITAL AGE

[1]Dr. Partha Sarathi Patra, [2]Dr. Sudhir Kumar Jena and [3]Dr. Kailash Chandra Das
[1]Library-in-Charge, SHM, SOA University, Bhubaneshwar, Odisha, INDIA.
[2]Librarian, IIM, Shillong, Meghalaya, INDIA.
[3]Head, PG Department of Library & Information Science,
Utkal University, Bhubaneswar, Odisha, INDIA.

1. INTRODUCTION

Collection development is the process of evaluating what is published and making purchasing recommendations based on these evaluations. Librarians identify the best resources for their constituencies based on the mission of their organization and the needs of their users. Originally based on printed items, this process has evolved to include audio, video, and now digital items.

The basic concepts of collection development remain the same regardless of resource format. However, there are special considerations when applying these principles to digital library collections. In digital library collection development, librarians are making digitization recommendations instead of purchasing recommendations. They are not evaluating what has been published, but rather what within their collection is most valuable and unique to users. In doing so, librarians must be aware of the digital resources produced by other organizations. With the implementation of the Open Archival Initiative's Protocol for Metadata Harvesting (OAI-PMH), resources in digital libraries are easily shared between organizations. Librarians should ensure their proposed collection will contribute not only to their own organization's needs but to the collective resources available to all.

In response to the many disparate digital collections libraries produced in the 1990's as experimental test-beds, the Institute for Museum and Library Services (IMLS) supported development of The Framework of Guidance for Building Good Collections . It was designed to encourage organizations to strategically plan their digitization projects and digital library collections in hopes that organizations would create collections that are useful for the long-term and can be integrated with existing digital collections. *The Framework* includes principles to guide development of four aspects of digital projects: collections, objects, metadata, and projects.

2. COLLECTION DEVELOPMENT

Library Collection Development is the process of meeting the information needs of the people (a service population) in a timely and economical manner using information resources locally held, as well as from other organization. The major trends in library and information science that have been identified with the recent analysis of the literature can be listed as follows:

- Increase in end-user access to computer-based information resources.
- Use of networks and telecommunications in libraries.
- Increased digital collection management activities.
- Dependency on web-based information sources.

Developing library collection of an academic institution is to fulfill the information needs and specific research of the institution's academic programs. The curriculum of the institution is the base for the

librarian to build up the collection of any academic library. This helps to cover all the subjects and programs to facilitate effective teaching and research.

3. IMPORTANCE OF A COLLECTION DEVELOPMENT POLICY

Well-framed collection development policy serves a broad range of functions. Some valuable reasons for framing policy statements are as follows:-

The Policy-

- Forces staff to think through library goals and commit themselves to these goals, helps them to identify long and short–range needs of users and to establish priorities for allocating funds.
- Helps assure that the library will commit itself to serving all parts of the community, both present and future.
- Helps set standards for the selection and weeding of materials.
- Informs users, administrators, and other libraries of collection, scope and facilitates coordination of collection development among institutions.
- Helps minimize personal bias by selectors and to highlight imbalances in selection criteria.
- Serves as an in-service training tool for new staff.
- Helps assure continuity in collections of any size and provides a pattern and frame work to ease transition from one librarian to the next.
- Provides a means of staff-evaluation, or for evaluation by outsiders.

4. COLLECTION DEVELOPMENT -REQUIREMENTS

- A well written policy
- Analysis of user needs
- Inter-and intra-library communication policy development
- Budgeting and allocation of resources
- Contract negotiations
- Macro-evaluation of collections
- Micro-evaluation for selection, preservation or withdrawal of stock
- electronic resources selection tends to be a group activity rather than an individual activity, and
- System evaluation.

5. RESOURCES COLLECTED

The Academic Libraries should collect all manner of formats and materials which support for teaching and research. These materials may be physical (e.g., books, paper journals, microforms, maps, pamphlets, and music or video recordings) or digital (e.g., online access to citation and full-text databases, e-books, and spoken-word, music or moving images).

6. CATEGORIES

Digital library materials currently collected by The University of Texas Libraries consist of three broad categories:

- Purchased or licensed material such as electronic journals or databases. These are generally acquired from a commercial source, a government entity, a non-profit organization, a professional society, or an institution engaged in furthering scholarly research. In many cases this material is not "physically owned" by the library in the same sense that a printed book or journal may be owned, but instead the library has acquired specific rights to the material on behalf of the library's clientele.
- Material that has been reformatted (digitized) by The University of Texas Libraries or the University from non-copyrighted print or analog sources, or has been reformatted from copyrighted sources with appropriate permission. In some cases the library may also serve as a

repository for material digitized by other libraries, universities, institutions, or individuals. Typically, this material consists of resources from special collections that have been selected for digitization in order to make them more widely available or deteriorating materials that have been reformatted for preservation reasons. As the use of digital material expands in higher education, the library will increasingly digitize materials on a programmatic basis in order to support the mission of the University and The University of Texas Libraries.

- Links and pointers to Internet resources of significant scholarly value which are added to the library's catalogs, databases, and networked resources as appropriate.

7. SELECTION CONSIDERATIONS

Selection criteria for digital library resources comprises four levels of review: is the content appropriate to the library mission; are the format and information delivery medium appropriate to the content and commensurate with the library rationale for acquiring the resource; is the acquisition practical within existing budgetary, technical, legal and other constraints; and is the resource compatible with the library's overall strategic digital library vision and current infrastructure.

- **Content:** Is the content intellectually significant? Is the content relevant to the University of Texas at Austin? Measures of intellectual significance include authority, uniqueness, timeliness, breadth or depth, and demand.

- **Is the format appropriate for the content? :** Is the format appropriate to achieve the underlying rationale for the acquisition of the resource? Print may be the appropriate format for a unique item with a low rate of expected usage; while high-use general undergraduate-level information resources, distance education resources, or frequently used reference material, may be more appropriately acquired in a networkable digital format. In a similar vein, special collection material with wide potential interest might benefit from re-selection for digitization to increase its utility and to make it available to a wider audience. An analysis of the advantages and disadvantages of a particular format, along with considerations of audience, intended use of the material, archival and access issues, and overall cost -- are all factors to be used in determining which format would be most appropriate for the library collection.

- **Practical Issues:** Does the library have the necessary overhead resources (equipment, staff, space, etc.) necessary to support the resource? Do library users have the necessary resources to utilize the content (computers, players, plug-ins, etc.)? Does the license or contract for the resource meet the library, university, and state requirements? Is the vendor reliable, is the format stable, and can we utilize the resource (linking, archiving, etc.) in the ways our users need? Does the digital product adhere to the best prudent practices of current library collection management (including, but not limited to, appropriate retrieval software, a well-designed interface, appropriate format and linking options, a properly reliable delivery mechanism, authentication and security designs that meet library needs, a library-friendly approach to fair use and copyright, quality statistical reporting, appropriate technical support, assurances of rights to permanent access, and appropriate licensing terms).

- **Strategic Considerations:** Is the resource compatible with the library/university/state information technology plans? Is the product compatible with the library's overall digital library vision and the library's current infrastructure in terms of its discovery, access, organization, and technical components? Does the product comply with the digital guidelines established by the International Coalition of Library Consortia? Is the product design and delivery consistent with the best practices of digital libraries?

8. GOALS

Within this framework, it is the objective of the library to collect scholarly digital materials in order to provide broad access to relevant scholarly information at every level of granularity including articles, monographs, and large databases. As with all formats, digital material should meet the same subject, chronological, geographical, language and other guidelines as outlined in the library's subject collection policies; and possess the same standards of excellence, comprehensiveness, and authority

that the library expects from all of its acquisitions. The library recognizes that different disciplines utilize different formats and different types of information in different ways, and that no one solution is appropriate for every subject or area of study. The ultimate goal of The University of Texas Libraries digital library collection development planning-is to provide seamless cross-linkages between all elements of the digital library whether commercially licensed or locally created, and whether the resources are locally or remotely mounted and serviced.

9. PRIORITIES

Priorities should be given to those digital materials that offer significant added value in supporting teaching and research over similar materials in traditional formats, that offer significant opportunities for cost containment, and whose license terms are reflective of the University's academic values. Measures of added value might include: additional content, greater functionality, greater accessibility, improved resource sharing ability, improved linkages with other information tools, ease of archiving, and the enabling of more efficient uses of limited faculty and student time and resources. Licenses should allow the library the flexibility to develop collections that match the University's needs without contractually forcing entangling ties to unwanted products, and without restricting the rights of fair use or the values of academic inquiry. License terms should also be financially sustainable and address archival rights to the resources in question. Materials that meet these and other selection needs will be given priority over digital material of a more problematic nature.

10. ISSUES AND CHALLENGES

- Technical Process
- Manpower
- Financial
- Archives
- Copyrights
- Acceptability
- Quality Assurance
- Infrastructure
- Building Digital Collections
- Metadata
- Image Processing

11. ROLE OF LIBRARIAN

In an academic library, especially scientific libraries, the emphasis is on current information. Here, the librarian plays a vital role to built-up a healthy collection to meet the requirements of the community. Certain parameters should be kept in mind while the developments of collection in a library are as follows:

- Type of the community.
- Activities of the community of the institute such as teaching, research, projects, publications etc.
- Density and intensity of collection.
- Type of material to be collected.
- Space in the library.
- Co-operation with other libraries, especially at consortium level.

12. CONCLUSION

Academic Libraries is firmly committed to a rationale-based collection management program which provides a framework for accountability and establishes the priorities necessary in governing day-to-day selection, acquisitions, and processing decisions. Digital collections are beneficial to all researchers, scholarly institutions, and the entire research community. Major benefits include: cost

saving, avoiding duplication of effort, broadening of the communication process, reduction in time in announcing findings, expansion of audience, and above all preserving information assets for the use of future generations. Atkinson (2003) recommended that the best way to restore the free flow of scholarly communication for universities is to take control of scholarly process. In this digital age the university libraries have to participate actively in creation and management of digital resources and become digital publishers. Lynch (2003), former head of California Digital library sees 'institutional repositories' as containing a wide variety of information format:' intellectual works of faculty and students' both research articles and teaching materials and documentation of the activities of the institutions and performances, ongoing research projects and its outcome. These are and can become the integral part of collection development for the universities. Now days the users of the university libraries are habituated to use more and more digital documents including e-resources. Besides, the rich cultural heritage and rare documents can be preserved and may be given access to users globally.

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COLLECTION DEVELOPMENT IN UNIVERSITY LIBRARIES OF ODISHA : AN EVALUATIVE STUDY

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1. INTRODUCTION

Library plays a significant role in the development of institutions for higher learning. The UGC attaches great importance to the strengthening of library facilities in the universities and colleges and their efficient administration. The commission has also been offering grants to institution for books and journals, construction of library buildings and appointment of library staff. There are mainly three important functions of a library, namely collection, storage and dissemination of information. The collection occupies the most vital position. It is the collection that reflects on the use of the library and effectiveness of other two functions. According to Y.T. Feng, "Collection grows in a myriad of ways. It may grow in size, it may grow in market value and it may grow in its relevance and use. It may grow in the scope of its coverage, it may grow in depth of its specialisation, or it may just grow, amoeba like, by means of pseudopodia in this case, a mixture of available funds and articulate personal preferences, whether from the librarian or the user". Collection development determines the quality of the service in building the resources of the university library. Library is expected to develop a core, qualitative and comprehensive collection so as to meet the requirement of the users. Thus collection development is necessary for each and every university library. The importance of the library collection is measured not only in terms of numbers but also in terms of their values and utilities to the clientele. Quality should not be scarified for quantity. Qualitative service of the optimum utilisation of the services cannot be performed without comprehensive and well balanced collection development in the library.

2. OBJECTIVES OF THE STUDY

The main objective of the study is to determine the strength and weakness of the collection of the university libraries in web scenario and to provide the necessary guidelines for improvement of the collections so as to make it more user responsive and effective. The important objectives are:

- To identify the strength and weakness of the existing collection;
- To know the book selection procedure of the libraries under study;
- To determine whether any collection development policy is followed by the libraries for the long term and short term needs for the users;
- To ascertain whether collection evaluation techniques are adopted to detect any short fall and limitations in developing a need based and live collection;
- To know the fund allocation methods for different departments in university libraries under study.

3. SCOPE OF THE STUDY

Presently there are eight universities, two technical and two deemed universities in the state of Odisha. These are:

- Utkal University, Vani Vihar, Bhubaneswar.
- Sambalpur University, Jyoti Vihar, Burla
- Berhampur University, Bhanja Vihar, Berhampur.
- Orissa University of Agriculture and Technology (OUAT), Bhubaneswar.
- Sri Jagannath Sanskrit Viswavidyalaya, Puri.

- North Orissa University, Baripada.
- Fakir Mohan University, Balasore.
- Utkal University of Culture, Bhubaneswar.
- Biju Patnaik University of Technology (BPUT), Rourkela.
- Central University, Koraput
- KIIT University, Bhubaneswar
- Sikshaya O Anushandhan University, Bhubaneswar

The study has covered only three major university libraries namely Utkal University, Sambalpur University and Berhampur University. Sri Jagannath Sanskrit Viswavidyalaya is excluded from the study due to the fact that this university is not coming under the category of general university. The reading materials, the mission and goal of the university are different as compared to other three universities. North Orissa University, Baripada, Fakir Mohan University, Balasore and Central University, Koraput are recently established as an affiliating and examining body with a small library thus excluded from the study. OUAT, Utkal University of Culture and BPUT, Rourkela, KIIT University, Bhubaneswar and Siksha O Anushandhan University are not coming under general universities thus excluded from the study. The universities under study have nearly similar curriculum, examination system and research on social science and science. Besides, the students of these three universities possess identical educational background for entering into the PG departments, which facilitate to form the same type of user community having nearly equal demands for documents. Thus the three university libraries are included in the study.

4. METHODOLOGY
The collections of three university libraries have been evaluated. Structured questionnaire and interview method have been followed for collection of data. The questionnaire has been divided into different facets and segments of collection development. The following tools are used for collection of data:
- Direct observation in the library;
- Structured questionnaire;
- Interview with the librarian and staff;
- Accession registers, budget files and other records of the three university libraries;
- Library and Information Science journals.

5. REVIEW OF LITERATURE
ALA [1977] had appointed the Collection Development Committee of the Resource Section, Resources and Technical Service Division for activities relating to collection development, and in particular to study the resources of American libraries and the coordination of collection development programmes, develop guidelines for the definition of selection policies, evaluate and selection tools for collection development and recommend qualifications and requisite training for selection personnel. The guidelines for the formulation of collection development policies were prepared by the committee members. Feng [1979] discussed that a written collection development policy facilitates a consistent, balanced growth of library resources and dynamic policy is one that evolves as the institution grows. Policy would be based on the understanding of the needs of the community it serves and seeks to define and delimit the goals and objectives of the institution. Srivastava and Verma [1980] provided the details of book collection in each Indian University Library. They have pointed out that "the condition of book resources in our country is not satisfactory. Our university libraries are very much ill- equipped as far as worthwhile book collections are concerned." Onadiran and Onadiran [1982] examined the library collections in university libraries in Nigeria. Selection policy, acquisition procedure and the relationship between book dealers and university libraries in Nigeria were investigated. Somnath Nair [1983] discussed the need for well defined collection development policy based on the results of a study conducted with regard to supply of books against specific orders in

three universities of Kerala. ILA [1985] organised its 13th annual conference on building library collections and national policy for library and information services. 35 papers dealing with various aspects of collection development in different type of libraries were discussed. The problems in the acquisition of different types of materials and resource sharing were discussed.

6. DATA ANALYSIS

Background Information: A survey or research case study present nature demands the background information about the libraries under information in order to provide a clear picture about their establishment, organization and services to users etc.

Table 1: University Libraries of Orissa

Sl. No.	University	Year of Establishment of University	Year of Establishment of Library
1.	Utkal University, Bhubaneshwar	1943	1962
2.	Sambalpur University, Burla, Sambalpur.	1967	1970
3.	Berhampur University, Berhampur	1967	1968
4.	Orissa University of Agriculture and Technology, Bhubaneshwar	1962	1964
5.	Sri Jagnnath Sanskrit Vishwavidyalaya, Puri	1981	1981
6.	North Orissa University, Baripada	1998	1998
7.	Fakir Mohan University, Balsore	1999	1999
8.	Utkal University of Culture, Bhubaneshwar	1999	1999
9.	Biju Patnaik University of Technology, Rourkela	2002	
10.	Central University, Koraput	2009	
10.	Siksha O Anushandhan University	1996	1996
11.	Kalinga Institute of Industrial Technology	1996	1996

Collection Development Policy: All the university libraries of Odisha i.e. UUL, SUL and BUL do not have written Collection Development Policy. However all the universities provide the importance of the users need, recommendation of users and suggestions found in the suggestion box are taken into account for development for short and long term programme for the users.

7. LIBRARY USERS

Table 2: Users in Different University Libraries

Year	UUL						SUL						BUL					
	PG	M Phil	Rs.	Teachers	Others	Total	PG	M Phil	Rs.	Teachers	Others	Total	PG	M.Phil.	Rs.	Teachers	Others	Total
08-09	2172	162	20	826	6	3186	1004	142	7	118	650	1921	1281	26	15	95	484	1901
09-10	2186	184	17	828	2	3215	1004	142	14	108	540	1808	1243	39	24	106	490	1902
10-11	2188	188	15	826	7	3224	974	127	13	98	510	1722	1201	121	13	106	492	1933
11-12	2184	179	20	828	5	3218	992	136	17	125	535	1805	1144	128	6	108	506	1892
12-13	2188	186	19	824	2	3208	1040	140	27	123	545	1875	1001	131	2	118	510	1762
Average No. of users in each year						3210	Average No. of users in each year					1826	Average No. of users in each year					1878

Table-2 indicates the users in different university libraries year wise. Users are very important component in collection management. Libraries must take into account the users need and collection management can be planned according to the requirement of the users. It has been found that SUL and BUL have average number of users 1826 and 1878 respectively. At UUL the average number of users in each year is 3210.

8. LIBRARY FINANCE

Table 3: Library Budget

Year	UUL		SUL		BUL	
	UGC Grants for Books	State Govt. Grants exclusively for periodicals	UGC Grants spent for books	State Govt. Grants exclusively for periodicals	UGC Grants spent for book	State Govt. Grants exclusively for periodicals
2002-03		No grant		No grant		No grant
2003-04		No grant		No grant		No grant
2004-05		No grant		No grant		No grant
2005-06		No grant		No grant		No grant
2006-07	13,00,000 for 10th plan		20,86,000 for 10th plan		21,15,000 for 10th plan	
2007-08						
2009-10						
2010-11						
2011-12						
2012-13						

The UGC provides grant to the libraries for purchase of books. During 10th plan, UUL received 13 lakhs, SUL received 20.86 lakhs and BUL received 21.15 lakhs. The university allocates the grant to departments for purchase of books in all the previous plans. In the Xth plan, the UGC allocates the grant department wise and the university library takes necessary action for recommendation by the faculty. It is very pathetic to observe that, the state govt. discontinued the grant to the university libraries meant for purchase of journals exclusively. As a result, there is a great deal of dissatisfaction among students, research scholars and faculty which ultimately brings a dead stop in research. To full fill the need and usefulness of the periodicals, so that adequate grant may be provided by the state govt. Also university libraries must take necessary action to purchase the core periodicals diverting the UGC grant.

Table 4: Criteria for Allocation of Grants

Criteria	UUL		SUL		BUL		Total Weightage
	Rank	Weight age	Rank	Weight age	Rank	Weight age	
Department wise (by subject)	1	5	1	5	1	5	15
Physical form of documents (Books)							
Newly establishment departments gets special grants			2	3			3
Strength of teachers, students, research scholars of the department			3	2			2

Table-4 indicates the criteria for allocation of grant in the university libraries. The ranks of the criteria 1, 2, 3 ranked by the university libraries are given weight age 5, 3, 2 respectively. It has been found that the allocation of grants in all the university libraries on the basis of "department wise" ranked '1' by all the university libraries and it got total weightage 15. The SUL also allocates grant on the basis of special grants to newly established departments and ranked '2'. Also the criteria on the basis of strength of teachers, students, and research scholars of the department have been ranked as '3' by SUL.

9. LIBRARY COLLECTION

Table 5: Growth of Books in University Libraries

Year	UUL				SUL				BUL			
2008-09	246142	3319	21.64	1.38	104260	3555	15.43	3.53	95230	8137	33.74	9.35
2009-10	244332	612	3.99	0.25	105365	1108	4.81	1.06	95230	0	0	0
2010-11	246754	0	0	0	108643	3278	14.23	3.11	99232	4002	16.55	4.20
2011-12	246754	0	0	0	110146	1503	6.52	1.38	99244	12	0.05	0.01
2012-13	258004	1562	10.19	0.64	110548	402	1.74	0.36	101499	2255	9.33	2.27
Total no. of books added from 1996-2006	15336				23040				24173			
Average increase of book/year	1534				2304				2417			

Table-5 provides the growth of percentage of books in the university libraries of Odisha. It has been observed from the table the maximum growth for SUL & BUL is in year 2010- 2011 i.e. 3.11% and 4.20% respectively, whereas for UUL maximum growth percentage is 4.56% in the year 2012–2013. There is also 0% growth for UUL in the year 2011-12 and 2009 – 2010 for BUL, due to lack of budget for books. For SUL the lowest growth is in the year 2012-2013 i.e.0.36%. The university libraries should procure latest books to update the collection.

Table 6: Selection of Periodicals

Person Responsible for Selection	UUL	SUL	BUL
Library committee	No	No	No
Head of the department	Yes	Yes	Yes
Teachers	No	Yes	No
Research scholars/students	No	No	No
Librarian	No	Yes	Yes

From the table-6, it is evident that the Head of the departments of the university libraries of UUL, SUL & BUL select periodicals. At SUL & BUL the librarian also select the periodicals which are of

general use to all the users. The teachers of SU can also select periodicals at SUL. Research scholars and students cannot select periodicals in three university libraries of Orissa.

Table 7: Recording of Periodicals

Methods	UUL	SUL	BUL
Register Method	Yes	No	No
Kardex	No	Yes	Yes
One card/two card/three	No	No	No
Computerized Periodical control system	No	No	No

Table-7 shows recording of periodicals in university libraries. It has been found that SUL and BUL libraries record their periodicals by Kardex method whereas; UUL still records it's periodicals by register method.

10. COLLECTION DEVELOPMENT POLICY

All the university libraries of Orissa i.e. UUL, SUL and BUL do not have written collection development policy. However all the universities provide the importance of the users need and recommendation of users and suggestions found in the suggestion box are taken into account for development of collection. The university libraries do not follow the collection development for short and long term programme for the users.

11. COLLECTION EVALUATION

Collection evaluation is a part of collection management in which existing collections are measured, analyzed and judged according to present criteria for size, relevance, quality and use.

Table 8: Method of Collection Evaluation

Criteria Used	UUL	SUL	BUL
User's survey	No	No	No
Direct method	No	No	No
Check List	No	No	No
Statistics	No	No	No
Formula / Standards	No	No	No

Table-8 describes the method of collection evaluation techniques in the university libraries of Odisha. It has been noticed that no collection evaluation technique used in the university libraries. Also it has been found that at UUL and SUL till date weeding out of books has not been done, where as 2206 number of books worth Rs. 29,576/- have been weeded out at BUL in the year 1998.

Table 9: Periodicity of Weeding Out

Frequency of Weeding Out	UUL	SUL	BUL
Yearly	No	No	No
When stock verification is done	No	No	No
Weeding out not done	No	No	No

Table-9 indicates the periodicity of weeding out of books in the university libraries of Orissa. It has been found that only BUL has weeded out books in the year 1998.

Table 10: Periodicity of Stock Verification

Frequency	UUL	SUL	BUL
Yearly	No	No	No
Once in two years	No	No	No
Once in five years	No	Yes	No

Table-10 cites the periodicity of stock verification in the university libraries of Orissa. It has been found that UUL & SUL have never verified their stock. Stock verification at BUL has been carried out in the year 1988.

Table 11: Status of Automation of Libraries

Status	UUL	SUL	BUL
Automation in progress	Yes	Yes	Yes
Partially automated	No	No	No
Fully automated	No	No	No

Table-11 indicates the status of library automation in the university libraries of Odisha. The libraries have already received the grants from the INFLIBNET Centre but the automation has not been completed. The other two university libraries i.e. SUL and BUL have separate computer sections and SOUL software of INFLIBNET is being used in the libraries. SUL is being providing Internet and UGC-INFONET Consortia service to the users. Due to shortage of fund, trained manpower and motivation to the existing staff may be the reason for delay of library automation.

Table 12: Technical Processing

Technical Process	UUL	SUL	BUL
AACR -I	Yes	No	Yes
AACR -II	No	Yes	No
DDC	No	Yes	No
UDC	No	No	No
CC	No	No	No

From the above table it is clearly shows UUL & BUL follows AACR –I, where as SUL follows AACR II.

Table 13: Access of Information through Network/Consortia

Networking	UUL	SUL	BUL
DELNET	Yes	Yes	Yes
INFLIBNET	No	Yes	No
ERNET	No	No	No
Others			

The above table shows that the UUL, SUL & BUL are the members of DELNET, Where as SUL is only the member of INFLIBNET.UUL, SUL & BUL are not members of any other Networking Association.

Table 14: Facilities and Services provided by University Libraries

Sl. No.	Facilities & Services	University		
		BUL	UUL	SUL
1	Circulation Services	Yes	Yes	Yes
2	Reference Services	Yes	Yes	Yes
3	Cubicles for research Scholar	No	Yes	No
4	Reprographic Services	Yes	Yes	Yes
5	Inter-Library Loan Facilities	No	No	No
6	Current Periodicals	Yes	Yes	Yes
7	Back Volumes of Periodicals	Yes	Yes	Yes
8	Bibliographic Services	Yes	Yes	Yes
9	CAS	Yes	Yes	Yes

10	SDI	No	No	No
11	Indexing & Abstracting Services	Yes	Yes	Yes
12	Translation Services	No	No	No
13	News Papers	Yes	Yes	Yes
14	Thesis/Dissertations	Yes	Yes	Yes
15	A/V facility	No	No	No

The above table shows UUL, SUL & BUL are providing Circulation Service, Reference Service where as Cubicles for research Scholar only offered by UUL.

Table 15: E-Resources and E-Services provided by the University Library

Sl. No.	E-Resources& E-Services	University		
		B.U.	U.U.	S.U.
1	E-Journals	Yes	Yes	Yes
2	E-Books	Yes	Yes	Yes
3	On-line Databases	Yes	Yes	Yes
4	Internet	Yes	Yes	Yes
5	Digital Library	No	No	No
6	OPAC/Web-OPAC	No	No	No
7	CD-ROM Databases	Yes	Yes	Yes
8	ETD	No	No	No
9	WWW	Yes	Yes	Yes
10	E-Newspapers	Yes	Yes	Yes

The above table shows UUL, SUL & BUL are providing E-Journals, E-books, On-line databases, Internet facilities where as , digital libraries has not set up by any library. OPAC/Web OPAC also not given by any university libraries.CD-ROM Databases accessible in all university libraries.ETD is not available in any libraries of the universities.WWW/E-Newspaper are offered in all universities.

12. LIBRARY STAFF

Table 16: Human Resources

Posts	UUL	SUL	BUL
Librarian	Vacant	1	Vacant
Asst. Librarian	3	1	3
Professional	12	8	8
Other supporting staff	26	13	10+8
Total	41	40	29

Library personnel are required in the libraries to handle and provide day-to-day activities of the libraries. The above table provides the details of the staff in the university libraries of Odisha. It is evident from the table that the post of librarian is vacant in two universities i.e. UUL & BUL. The post of the librarian is filled up but the two asst. librarian posts are laying vacant at SUL. It is clear that the senior posts are vacant in the university libraries of Orissa. The staffs are also inadequate in the university libraries of Odisha. It is pathetic and unfortunate that the UGC pay scale has not been implemented in the university libraries of Odisha.

13. FINDINGS & SUGGESTIONS

- The university libraries of Odisha do not get adequate financial assistance for purchase of books, journals and electronic resources. There should be specific budget for the procurement of new e-resources and renewal of existing resources such as CD-ROM, e-Journal and online

subscription etc.

- None of the university libraries of Odisha have written collection development policy. Collection Development Policy should be implemented in every University libraries and it should be reviewed at regular interval.
- Creation of "Union catalogue of books, periodicals and Ph.D. theses" for university libraries of Odisha.
- The UGC pay scale is not implemented in the university libraries of Orissa. The university libraries should also train their staff members and users to motivate to work in the automated environment.
- The university libraries of Odisha do not weed out their unused books periodically. Regular weeding out of books should be carried out in the university Libraries. Stock verification should be conducted in the university libraries and the most demanded lost books be replaced. The shelf list card may be used for this purpose.
- The university libraries of Odisha are in process of computerization. The university libraries should also train their staff members and users to motivate to work in the automated environment.

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COLLECTION DEVELOPMENT POLICY IN INDIAN UNIVERSITY LIBRARIES IN 21*st* CENTURY

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1. INTRODUCTION

Developing a qualitative and suitable information base is essential in each library. The library possesses adequate and well balanced collections based on user needs can only serve its users community. A university library plays a significant role in instructional program of an academic institution. The meaning of the term "collection development" has under gone considerable changes with the progress in the field of library and information science. The term "collection development", "selection" and "acquisition" are used interchangeable in library science literature but they are, by no means synonymous. They represent a hierarchy in which collection development being a planning function is placed at the highest level. Selection is the second level of decision making and acquisition the third level, is the process by which library acquires various materials implementing selection decisions and collection development policy. Collection development has to be constantly guided by the requirements of the institution. In this information age, it is not practically possible for any library to satisfy all the information needs of all the users all the time. The libraries are still predominately document oriented, and it is only in the recent years publications in electronic media have become available. It is important here, to note that many of the fundamental changes in libraries will occur more in the process than in the product.

2. COLLECTION DEVELOPMENT POLICY

The objectives of the library are to support the institutional goal for providing information and reference to the users. Also the services of library are also structured according to the need of the institution and the users. Collection development policy is to be drafted according to the need of the library and institution. According to Linda Ward[1], "a collection development policy is a statement indicating in what direction the collection is headed; it is not a description of an existing collection. Consequently the primary purpose of a collection development policy is to state the principal collection objectives of a library. It ensures that the collection is developed in a rational and systematic manner and that budget available for acquisitions is spent on materials most needed by the library users". Some of the functions of collection development policies are:

- Collection development policy is as an informational document which presents an overview of the library and its collection.
- Collection development policy is used in preparing the budget for acquisitions.
- Collection development policy is also used to justify the budget requested.
- Collection development policy is used as the justification for the rejection of requests for items to be acquired and for the presence of items already in the collection.
- Collection development policy must be recognized as a legitimate document itself. Consequently, it is essential that the policy be a joint document of the library and the faculty and that it is approved by both.

The purpose of such a policy statement is to assure stability not rigidity. It will provide a clear guideline with regard to fund allocation, the subjects need to be developed, determination of the potential needs of the users and assessing the areas where in the resource sharing can be practiced.

3. PURPOSE OF COLLECTION DEVELOPMENT POLICY

Donahue et al[2] outlines the purpose of CDP as:

- "To provide a public document which reflects the internal process of evaluation by which the university library determines collection objectives.
- To represent an objective process for establishing long and short-range priorities for collection intensity and depth.
- To facilitate consistency in planning and communicating priorities.
- To provide guidance for fund allocation and approval profile construction.
- To determine areas for co-operative sharing and development of resources.
- To provide guidance in withdrawal of materials from the collection".[5]

The purpose of such a policy statement is to assure stability, not rigidity. It provides a clear guideline with regard to fund allocation, the subject needs to be developed, determination of the potential need of users and assessing the areas where the resource sharing can be practiced.

4. UTILITY OF COLLECTION DEVELOPMENT POLICY

An effective and balanced collection can be developed if it is based on the concrete and solid structure of a collection development policy drafted considering the goal and mission of the library as well as of the institution. A collection development policy has a great impact on all the activities of the library, which brings good dividends. The utility of the policy can be discussed as mentioned below:

- It helps to develop a consistent and comprehensive collection;
- This is a policy, which is prepared according to the immediate and future needs of the users taking into consideration of the aim and objectives of the institution it serves;
- It can act as a tool by providing the required guidelines to carry out tasks involved in selection of library materials along with effective collection building;
- It explains the goal of the library and helps administrative authority in establishing priorities for fund allocation;
- It is a tool for justification of financial support for acquisition of various kinds of library materials;
- It can facilitate the library to have the optimum use of the resources by providing the right type of materials to be used by the right type of users at the right time for the appropriate purpose;
- It helps to evaluate the quality of the existing collections. In other words, it will reveal the strength and weakness of the existing library resources;
- It will make the library staff more cautious and careful in selecting library materials, meaningfully required by the current as well as potential users;
- In a university library, the faculty and students are the main focus and keeping in view their need, the collections are to be developed.
- Assessing and analyzing the trend of use of collections, it enables the librarian to predict future use; a prediction which must be the deciding factor in the formulation of collection development policy for the potential users.
- The application of sound professional judgment will be fundamental to the quality of policy; a policy statement should not be adopted hastily as in the midst of a crisis it may stand the test of time.
- It must be reviewed at regular intervals in accordance with the changes in teaching methodology, alteration in curriculum, changing budgetary situations and new research programs;
- The collection development policy is an official document, which gives formal recognition to the criteria to be followed by the library.

This recognition however is becoming more and more important in the age when university spending is receiving so much scrutiny. It is the basis for rational and systematic development of collection building, which ensures that the need and requirement of the library users are meet properly. On the whole, the collection development policy establishes the norms and rules for planning, budgeting

selecting and acquiring library materials for optimum utilization of both intellectual resources by the users to achieve the goals of the library and parent organization.

5. COLLECTION DEVELOPMENT POLICY FOR ELECTRONIC DOCUMENTS

ICT is changing the environment of libraries and information centers in India. The advent of INTERNET and subsequent services have revolutionized the concept of libraries and changed the way information processed, stored, transmitted retrieved and disseminated. It has large volumes of electronic information in almost all fields of human knowledge. Most of the libraries in India are providing traditional as well as ICT based services.   Collection development policies guide budgeting decision and the decision to acquire or access a single electronic resource having significant implications. Total cost may include hardware, access software, site preparation, technical support, costs, and maintenance and consequently, the potential financial risk of poor choice is often notably higher for electronic resources.

A policy makes clear the need to consider cost implications of the infrastructure necessary to access electronic information. Varalakshmi[3] defined the following elements for collection development policy. The general elements of collection development policy are common, though the specific elements many vary from library to library.

- Collection Development policy (CDP) should specify the short and long term objectives of the library.
- Users profile should be maintained to know the users need.
- Collection Development policy is a planning activity hence it needs carefully executed in three levels.
    o CDP decisions are made at the highest level.
    o Selection of resources is the second level of decision making and acquisition of materials.
    o The third level is the process by which library acquires various materials, implementing selection decision and collection development plan.
- Necessary statements regarding specific media such as print, optical and on-line databases have to be derived. In other words, a statement of selection criteria has to be made. The collections should support academic program and related aspects specified with their geographical and chronological coverage, language necessary duplication etc. They need to specify the core subject collections and those to be accessed from other sources.
- Statement must be made on the specific formats such as books, periodicals and other sources of information. One major issue here is the balance between print and electronic collections; local collections and remote access to materials. The emergence and adoption of full-text electronic resources brought in significant challenges. It is high time for libraries to find and appropriate answer as the situation is moving all the time.
- Another important issue is the acquisition procedures. The libraries have well defined acquisition procedures for print publications. However, the selection and acquisition process of e-resources is often more complex due to involving standards to market and require electronic resources. There are two important aspects that need attention in the policy statement:
    o Licensing/private agreement issues;
    o Multi-campus access to e-resources. These are the issues that necessitate developing an integrated policy decisions from publishers and libraries. These are issues of concern as the publisher charges more for multi-user access within the same building.
- A major technical issue with e-resources is security, authentication and authorization of collection. Hence there is a need to select universally acceptable data providers.
- The selection responsibility ultimately lies with the librarian and head of acquisition section that can get the policy a reality with the approval of library advisory committee. The next issue is to re-examine and redefine the role of selectors/acquisition library personnel suitable to the conventions of access in the new information environment, with ability to access shared virtual

resources.

- Another important issue is coordination of the library resources, with other available resources through agreements or understanding. Suitable means and methods have to be devised to achieve effective resource sharing.
- Policy revision has to be made on regular basis to keep up with changes.

Collection development policies protect libraries in legal and ethical matters for provision of guidelines for decision making. It will clarify who has responsibility for selecting electronic resources and who has authority for negotiating and signing to contracts. The purchase capacity of the university libraries have been decreasing day by day due to budget cut in one hand and on the other hand the increasing volume and variety of information. These forced the libraries to formulate collection development plan and program for providing effective service to the users. No matter how detailed collection development policy statement may be, individual judgment is still necessary. The elements described earlier must be taken into account while formulating a CDP for electronic resources. In the ever changing technology centric publishing industry, we cannot adhere with a fixed collection development policy for long time. There must be guidelines for collection development with possibility to amend them time to time to accommodate the new technological development i.e. new electronic resources.

6. SELECTION CRITERIA FOR E-RESOURCES

Electronic resources are changing the image of academic libraries. These resources have changed the principles of selection radically. The art of selection is undergoing profound change, the selection of materials is still crucial for libraries. The four basic criteria for selection – quality, library relevance, aesthetic and technical aspects and cost remain same in the electronic era of information. Selection decisions will have to be made, the cost will play a major role in what selectors choose to purchase. Selection criteria are required for library in making good decisions so that library purchases the best to satisfy its users. The following criteria are described by Natarajan[4].

- Selection of e-resources will be based on users' real need. This may be accessed through user's survey and user recommendation etc.
- E-resources generally available through Internet are to be located and try to minimize duplication of resources.
- E-resources of the existing collections should not be duplicated, but will link to sites with existing ones or web portals on specific subject areas.
- E-resources must be searchable through a variety of ways such as keyword, subject and name searching.
- Quality of retrieval and search engines must be taken into account while selecting e-resources.
- Quality of e-resources can be determined by collection weighing several factors, such as authority, content, currency and special attributes of the work.
- The costs of equipment and support requirements as well as licensing fees must be considered in addition to the purchase price of the product.
- Vendor support in terms of technical support must be evaluated.
- The authentication protocol for connecting to the resources must be evaluated.
- Licenses must be carefully reviewed to ensure that the library maintains fair use rights for its users and that the resource is easily accessible to all users with minimum monitoring.

The library's selection criteria are an integral part of a collection development policy. These are the attributes of information sources that selectors consider when making a selection or access decision. Every library will have its own variation of this set of criteria to be used in explaining how materials are selected or rejected.

7. PROBLEMS OF COLLECTION DEVELOPMENT IN UNIVERSITY LIBRARIES IN INDIA

The major problems for successful implementation of collection development program are no collection development policy, unavailability of materials, paucity of funds, shrinking of budget and change in user need. The following problems are also facing by the Indian libraries for successful collection development.

- Relentless price rise of books and journals year after year, outstrips the fixed shrinking library budget and fluctuation in the exchange rates of foreign currencies.
- Unfair trade practices by book sellers, distributors and publisher agents.
- Practice of quotation systems in purchase of books and other documents.
- Allocation of library grants at the far end of financial year.
- Non availability of current and adequate book selection tools.
- Rare and out of print books.
- Few suppliers of non book materials.
- Non availability of union catalogue.

Chowdhury and Chowdhury[5] discussed how collection development is a complex process and important in the electronic environment and remarked that "since many reference and information services are now available for free through the internet, it is now important for digital library managers to decide whether it is worth spending a large amount of money on building and maintaining a collection of reference sources which are by nature expensive to acquire and update. There are some risks to the sustainability of the free reference and information services is not ensured, their quality is not always high. Nevertheless, these developments have forced library managers to think carefully about the management of digital references, collections and services. This is a time when digital library researchers and managers should think of the best ways and means to make optimum use of the technology and of the experience and expertise of human intermediaries in improving digital libraries from mere access centres to information service providers."Thus in the Indian universities as electronic resources are new to their libraries, librarian should develop their collection of both types of resources i.e. traditional as well as electronic sources. Thus hybrid library concept will emerge in the present university library environment in India.

8. COLLECTION DEVELOPMENT POLICY IN INDIAN UNIVERSITY LIBRARIES

A survey was done in the university libraries of Orissa[6]and found that the university libraries do not have written collection development policy. It is also holds good for almost all the university libraries of India. It is high time to develop the CDP for each and every university library. UGC should take initiative for collection development policy for providing grants, weeding out policy, stock verification, writes off policy of documents.

Existing collection development guideline of NACC, AICT, Knowledge Commission and other Agencies guidelines may be taken into consideration while preparing the Collection development Policy. University Grants Commission may set up a committee to prepare broad guideline to frame Collection Development Plan for Indian University Libraries.

9. SUGGESTIONS TO DEVELOP COLLECTION DEVELOPMENT POLICY

It is very difficult to build the collection of university libraries. Hence, in each and every library written collection development policy is required so that collection can be well balanced and satisfy the user's needs of the library.

The success of the collection development policy depends on user's survey and should be oriented

towards supporting instruction and research, enabling the academic community to get all that is required to keep themselves up to date with the latest development in their respective fields. It is a matter of controversy throughout the world that who should select the documents. Teachers are the subject specialists and librarian is the literature specialist, if complete responsibility is given to faculty, he is most likely to build the collection of his narrow field of specialization without taking any interest in other fields. Hence faculty, librarian, library staff also the students and research scholars of the university should participate in selecting documents for the library. Bonn[7] has opined that finally it is the responsibility of the librarian to take absolute decision whether the library should purchase the best obtainable book for the library and the library can actually afford to buy it. Librarian should always see that basis for selection be positive and not negative. Also the selection must satisfy the long-range need of its users. The collection should be developed keeping in mind the teaching, research program and other aim and objectives of the university.

The university libraries need to organize a collection development division as one of the department in the library. The functions of the department are to identify the information resources development, maintenance and growth of the library. Also the department must draft and prepare collection development policy. The following points must be taken as guide line while framing the Collection Development Policy.

- Collection development policy should avoid personal bias and to arrive at a more functional collection satisfying the diverse interest of the users.
- Collection development policy should be reviewed at regular interval.
- Collection development policy should be flexible.
- Collection development policy should be implemented with the consultation with the faculty, librarian and the administration.
- UGC/INFLIBNET can take a lead role and prepare a model set of collection development policy that helps as guidelines to the individual library.

Now electronic resources are either digitally born or converted books, journals or other records. Electronic resources have edge over printed material in saving space and in easy access both online and off line. University libraries should join consortia for increasing the ability of the library to offer its users an opportunity to have access more documents for their users. INFLIBNET is providing UGC INFONET consortia for the university libraries. University libraries should take the benefit of the service. University libraries should develop their institutional repositories of all the publications, research articles, reports etc. published by the faculty and staff. Digitize their collection and make them available online.

10. CONCLUSION

University libraries are changing very fast in the information society to satisfy the ever changing and demanding users. The old concept of library as a store house of knowledge are changing fast, to concepts based on development of 'intermediary' roles in the hybrid environment in which the documents are either traditional document or electronic resources. The librarian should prepare collection development policy according to the need of the users and policy of the library. Resource sharing may be practiced; library consortia may be formed so that the users can access the documents.

University libraries should provide cost effective access to information to their users. The remote university libraries should also access the information, which remove the barriers of distance and time. Libraries are integral part of the academic mission of universities. Libraries can enhance a university's reputation by providing access to world-class information resources and services. Collection development in university library is not an easy job. This should be done carefully and should be based on policies and programmes chalked out of representatives of faculty members from various faculties in cooperation with librarian. The involvement of all staff members of the library is also essential for developing a balanced collection.

The library and information services of the 21st century are fast changing. The services of most of the libraries are not confined within four walls but are integrated into local, regional, national and even international networks. With the rapid development of E-resources libraries should acquire both printed and electronic sources of information because E-resources are the most nascent entity in libraries considering the long experiences had with print media. The E-resources are going to continuously increase day by day due to users demand and requirement. Libraries have to cope up with the latest ICT gadgets, E-resources as well as the knowledge of print media to serve the users need and requirement in the present era.

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COLLECTION DEVELOPMENT IN ELECTRONIC ENVIRONMENT : ISSUES AND CHALLENGES

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1. INTRODUCTION

The developments that are emerged during the present century have brought many opportunities and challenges for the libraries in general and library professionals in particular. The most important issues of realities are electronic publishing and networking of libraries, changing concepts from ownership to access and commercial availability of databases etc. These realities have a direct impact on libraries. Hence, LIS professionals must cope up with these realities to meet the challenges. Presently, "Economic forces and technological advances have combined together to create a new environment where access to collective scholarly resources that no library could be ever afford, supersedes the historic quest for the great comprehensive collection" (Harloe and Budd, 1994). Due to the ability to deliver information to remote users the library resources are different from the way they were ever before.

2. IMPACT OF E-PUBLISHING

According to Kovacs (1999) the advantages to libraries and their users in solving these problems and using the solutions in providing library services are:

- Access is increased for more users to more publications than individual libraries can acquire and store.
- Collection Development and co-operative collecting are simplified because libraries can share central storage and retrieval facilities.
- Preservation is made easier because of the relative ease of duplication and archiving of electronic publications.
- 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.

E-publishing refers to the use of information and communication technology in publishing or distributing information. The impact of 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 LIS services. The basic problems in managing e-publication for libraries and their uses include:

- Providing access that matches the technological capabilities of both library professionals and users.
- Providing access that satisfies the profit motive of commercial e-publications.
- Collection Development that require knowledge of the electronic delivery mechanisms, as well as the subject content of e-publications.

3. TRADITIONAL VS. ELECTRONIC ENVIRONMENT

The ways of accessing information and library operations have undergone metamorphic changes the libraries have not only to balance funds between serials and monographs but also between paper and electronic resources. A paradigm shift is observed in the overall information environment which is highlighted in the following table:

Traditional Environment	Electronic Environment
Reading	Browsing
Ordering, Billing, Invoicing	E-commerce
Writing	Web Publishing
Classification	Subject directories, subject gateways
Cataloguing	Metadata
Indexing system	Search strategies
Document delivery	E-prints, scanned images, attachments etc.
Card catalogue	OPAC/ Web OPAC
Interlibrary loan	Consortia
Literature search	CD-ROM, Web search etc.
Resource sharing	Networking

4. ADVANTAGES OF E-RESOURCES

According to Lee and Boyle (2004) the followings are the major advantages of e-resources:

- **Speed:** It takes little time to browse or search, to extract information, to integrate that information into other material.
- **Functionality:** an electronic version will allow the user to approach the publication and to analyze its content in new ways (e.g. with a dictionary one would no longer be restricted to searching under headwords).
- **Multi-user access:** Same copy of the article or page can be accessed by more than two users sitting on their desktops.
- **Content:** Electronic resources consist with the multimedia effect, i.e. images, video, audio, and animation, which could not be replicated in print.
- **Storage:** It is becoming very cheap to store data with the dramatic reduction in the costs of computer hardware.
- **Management:** Electronic resources can be managed effectively by appropriate software.
- Inter-operability: With the advent of such standards as Open URL, we are increasingly witnessing the linking together of systems so that one item within an electronic resource can directly link to another elsewhere.
- **Re-Use:** Electronic resources can be repackaged and re-used in such systems as Virtual Learning Environments, or resource/reading list tools.

5. COLLECTION DEVELOPMENT POLICY

A collection policy is a standard library practice for publicly declaring a library's intent for breadth and depth of the material it will collect within certain subject areas, genres, or physical formats. Such declarations are useful tools that scholars can use to determine the relative utility of a collection for their purposes, as well as to assist in cooperative collection development with other libraries. Typical collection development categories for print collections include such as:

- **Comprehensive:** A collection in which a library endeavors, so far as is reasonably possible, to include all significant works of recorded knowledge (publications, manuscripts, other forms), in all applicable languages, for a necessarily defined and limited field.
- **Research:** A collection, which includes the major published source materials required for dissertations and independent research, including materials containing research reporting, new findings, scientific experimental results, and other information useful to researchers. It also aims to include all important reference works and a wide selection of specialized monographs, as well

as a very extensive collection of journals and major indexing and abstracting services in the field.

- **Study:** A collection which is adequate to support undergraduate and most graduate course work; that is, which is adequate to maintain knowledge of a subject required for limited or generalized purposes, of less than research intensity.
- **Basic:** A highly selective collection which serves to introduce and define the subject and to indicate the varieties of information available elsewhere.
- Minimal - A subject in which few selections are made beyond very specific works.

6. ECONOMIC AND LICENSING ISSUES

Providers of electronic information resources (i.e. licensor) are employing licenses as a legal means of controlling the use of their products. In the electronic environment where the traditional print practice of ownership through purchase is being replaced by access through license, libraries need to be aware that licensing agreements may restrict their legal rights and those of their users.

- **Authorized Users:** persons who are authorized to use library's facilities and/or are affiliated with library as students, faculty or employees, or are physically present in the library.
- **Fair Use:** use of the product for non-commercial educational, instructional and research purposes by authorized users including viewing, downloading, copying, printing and emailing.
- **Access:** permanent use of the resource or access rights only for a defined period of time. Access provided through IP address or other mutually acceptable authentification and authorization methods.
- **Use:** searching, displaying, copying, saving data, reformatting data, interlibrary loan, course packs and electronic reserves by authorized users simultaneously as well as remotely.
- Intellectual property: Any trademarks, issued patents and patent applications, copyrights and copyright registrations and applications, rights in ideas, designs, works of authorship, derivative works, and all other intellectual property rights relating to the licensed resource.
- **Network:** a group of computers linked together to share information. Networks can consist of a number of linked computers in a single physical location, a Local Area Network (LAN) or they may consist of computers located at different physical sites linked together by means of phone lines and modems or other forms of long distance communications.

7. ISSUES RELATED TO COST

PEAK (Pricing Electronic Access to knowledge) is exploring several pricing dimensions, including different product bundle as well as nonlinear pricing opportunities offered by electronic access. While traditional journals have familiar bundling conventions, electronic access allows us to conceive of new types of bundles and pricing options for those bundles. Experts have suggested the three product and pricing options are as follows;

- **Per article** – unlimited access by individual users to specific articles purchased at a fixed price.
- **Subscription** – unlimited access by individuals and institutions to articles that relate to printed titles.
- **Generalized subscription** – unlimited access by institutions to bundles of 120 articles used subsequently by users.

One interesting aspect of the first and third options is that access to articles is for the life of the project. In other words once an article is purchased, it is available at no extra charge to all authorized users within the institution.

According to Mackie-Mason and Jankovich (1997), Elsevier Science intends to consider the following differentials in future electronic pricing models.

- Value of Functionality
- Number of Users
- Frequency of use

Mackie-Mason and Riveros (1997) concluded that electronic access provides considerable 'space' for product bundling and pricing structures. New pricing structures with greater flexibility for different market sectors should result. Otherwise publishers are at risk of starving themselves out of business, as evidential by the continued stream of paper journal cancellations that have taken place across the world in recent years.

8. CHALLENGES BEFORE LIS PROFESSIONALS

Due to the advances in science and technology and latest developments in information and communication technology have great impact on every aspect of LIS services and operations. The traditional resources are shifting towards electronic resources. The electronic medium has given a scope for more efficient means of storage, organize and quick access from remote places. As a result it forces libraries to develop and provide electronic resources. Keeping in view all these changes the LIS professionals have to accept and adapt the phenomena of change. Thus, few major challenges before LIS professionals summarized by Zhou (1994) and Branin (1994) as follows:

- Information professionals should have expertise in total management of information.
- Collection development librarians have to be more proactive by becoming familiar with the environmental changes so that they could adapt better as the changes unfold.
- Librarians need to rethink their approaches to marketing when it comes to online resources, details that were incidental to marketing print resources may be crucial to how well an online product is received by users.
- It is important for library professionals to focus on the capabilities enabled by the networked environment rather than the complications brought forth by the complexity of network based information resources and services.
- The information professional needs specific training to understand the implications of the new working conditions.
- Information professionals require becoming knowledge managers rather than collection mangers in order to manage the intersection of the print and the electronic information systems by applying the skills of collection planning, selection, analysis and co-operation.
- Mind-set of the library professionals has to be changed in order to enter into the electronic era by revising professional methods, techniques and tools.

9. CONCLUSION

The collection development and preservation environment of a library is the aspect of library structure that is likely to be most affected by the recent development in ICT. In such an environment it is probably best implemented within a distributed object framework. The LIS professional or Librarian must act as an information officer or knowledge manager, applying the skills right from collection, planning, selection analysis and cooperation in order to manage the intersection of both print and electronic resources. In this changed environment the duty of a LIS professional is to expand the range of resources for the benefit of users especially to include those available in electronic format, such as web-based or electronic accessible information resources. The LIS professionals must not only to identify and facilitate access to electronic resources but also to educate the users about how to access them and when to use them.

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COLLECTION DEVELOPMENT POLICIES FOR ELECTRONIC RESOURCES : AN OVERVIEW

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1. INTRODUCTION

Today we are living in the age of information. The information is a dynamic and unending resource that affects all disciplines and walks of life. Over last decade, electronic resources have become increasingly substantial components of academic library collection. This is due to the continuous development of Information Technology and its impact on library collection development policies due to changing demand of users for the pin pointed and exhaustive information within a short time. With the growing popularity of e-resources, the traditional libraries are gradually migrating from print documents to e-resources where providing access to information is considered more important than owning it. This has compelled libraries to rethink about their collection development functioning. Applications of ICT in libraries have provided enough opportunities for e-resource development and disseminate it in the manner that their users preferred. Among e-resources, e-journals and e-books are mostly in demand by the users.

Electronic resources represent an increasingly important component of the collection building activities of libraries. The aim of the Libraries is to provide an effective combination of print, non-print and electronic resources, and the integration of the use of these resources in support of teaching, learning and research. Collection development at the Institutional/University Libraries is a process of selecting, acquiring, and providing access to traditional and electronic resources supporting the information and scholarly needs of students and faculty. Due to the high cost of electronic resources subscriptions, the library committee member (in consultation with appropriate chief executive) is charged with making cost-effective and balanced purchase decisions based on institutional needs. At the same time, a major goal of acquiring electronic resources is the provision of access both on and off campus in the most affordable manner possible. The Library will pursue partnerships in cooperative acquisitions and cost-sharing both within and outside of institute through consortia. For this purpose the communication between the library committee members and faculties to identify collection needs, formulation of library policies, budget distribution, collection assessment, planning and coordinating selection and acquisitions activities, preservation and weeding are fundamental to the collection development process (Nahak, 2011). There has been great diversification in the range of electronic formats available due to emergence of new technologies, CD-ROMS, e-journals; e-books and World Wide Web are relatively the recent developments .Electronic advancements are happing so quickly that determining which format to buy, which tools is most cost effective in the future can be daunting task (Singh, 2004).

2. SCOPE

"Electronic resources" refer to those materials that require computer access, whether through microcomputer, mainframe, or other types of computers, and that may either be locally mounted or accessed remotely via the Internet. This policy covers both free Internet resources and electronic resources purchased or licensed by the Libraries from a commercial source or any other-sources.

3. FORMATS

Except for those formats excluded in the Collection Development Policy, any type of electronic resources may be considered for inclusion. Some of the common types are:

- Indexing and abstracting databases
- Full-text databases
- E-journals
- E-books
- Reference databases (directories, dictionaries, encyclopedias, etc.)
- Statistical databases etc.
- Graphics and multimedia files

4. SELECTION CRITERIA

In this part it provides some guidelines for the selection and acquisition of electronic resources. All policies and guidelines in the Collection Development Policy, including the General Selection Criteria and Duplication Policy, will also apply to electronic resources.

5. COURSE AND CONTENT BASED

- Electronic information must support the curricular and research needs of the University and there should be an expected level of use.
- All electronic resources should be relevant and appropriate to the Libraries' user community and reflect current academic needs and the University's mission. Consideration should be given to electronic resources that provide coverage of underrepresented or high-priority subject areas.
- The content should come from an authoritative author and or publisher on the subject. Other indicators of quality include positive peer and professional reviews.
- Accuracy and completeness as compared with print format, if available. This means that the electronic resource should have all the articles, illustrations, graphs and tables as they appear in the print counterpart.
- The search and retrieval software must be powerful and flexible.
- The system should support multiple export options (email, printing, and downloading.)
- The product should be "user-friendly," that is, provide ease of use and guidance for the user via appropriate menus, help screens, or tutorials.
- The product should equal or improve the quality of library resources.
- The Libraries' cooperative/consortia arrangements may influence the outcome of the criteria.
- In addition to the cost of the product, if any, the following hidden costs need to be considered: licensing fees, hardware, software, staff training and continuing education, duplicating support materials, updates, maintenance, cost of additional simultaneous users, and any other costs.

6. ACCESS

Electronic Resources must meet the following criteria:

- Delivery via the web
- The electronic resource should be available for remote access.
- Authentication by IP address (rather than passwords or logins)
- Compatibility with the Library's existing proxy server and software.\
- Both IP address and login password.

7. USER-FRIENDLINESS

Electronic resources should adhere to conventional user expectations such as:

- Availability of on-screen help and/or tutorials
- Basic and guided/advanced searching

- Helpful error messages (i.e., error message indicates specific problem(s) and provides possible alternatives)
- Ability to print, save, and email results and/or articles

8. VENDOR CONSIDERATIONS

- Provides responsive customer service and technical support that is available during library working hours.
- The electronic resource should be available for trial. Preferably, the vendor will provide product demonstrations if needed.
- If needed, the vendor should provide initial and, preferably, ongoing product training.
- Customer and technical support should be timely, accurate and professional.
- The vendor should be prepared to respond to the Libraries' requests for customization.
- The vendor should provide advance notifications for content and platform changes.
- Documentation is thorough and clear.

9. COST CONSIDERATIONS

- The vendor should offer a choice of pricing models from which the Libraries may select. These models could be based on various criteria, including the number of simultaneous users and user population.
- The cost of the electronic resource should not exceed that of the print counterpart
- Ability to sustain cost for the foreseeable future.
- Potential usage and/or uniqueness of information justify cost.
- The Libraries should not be required to purchase both the print and electronic versions of a resource.

10. TECHNICAL CONSIDERATIONS

- Meets usual and customary technical standards in the industry
- Allows for local customizations via system administration access for the Library
- Product is compatible with the Library's existing and/or future hardware
- Product is compatible with standard web browsers if accessible via the web
- Usage statistics are readily available in a user-friendly format.
- Availability, e.g., remote access, stand-alone access.
- Authentication, e.g., IP [Internet Protocol] filtering or login password.
- Storage and maintenance, e.g., remote hosting v. local hosting.
- Platforms which facilitate access to e-resources.

11. LICENSING CONSIDERATION

- 'Authorized Users' should be defined as broadly as possible. Bona fide faculty members, students, researchers, any employees of the University as well as on-site users of the University should be included as authorized users.
- "Authorized Sites' should be defined as broadly as possible. Authorized users should be permitted to access the electronic resource from anywhere via the campus network.
- The license should permit fair use of all information for non-commercial, educational, instructional, and research purposes by the Libraries and authorized users. These include viewing, downloading, and printing.
- Period of agreement
- Compliance with the governing laws of the library's or consortiums legal jurisdiction.
- Vendor should define a standard period of agreement that describes the rights of the Libraries in easy-to-understand.

- The library purchases access to or data from publishers who require signed license agreements.
- When negotiating license agreements, the library keeps the interests of the user in mind and refrains from purchasing products where use restrictions would seriously impede research or be impossible to enforce.
- The acquisition in-charche/librarian coordinates the review of license agreements and submits the signed license agreement as part of the ordering procedure.
- The library will consult with library committee/library chairman to amend vendor license agreements on a case-by-case basis to ensure use is granted to the fullest extent possible.

12. DECISION MAKING PROCESS

Requesting New Subscriptions: All new electronic resources must be requested through the librarian in consultation with faculty the library committee will consider whether or not the product meets the selection criteria outlined in the Electronic Resources Collection Development Policy.

- The librarian will request pricing for the product and investigate consortia purchase options
- The librarian will request a trial of the product. All trials should be coordinated through the librarian. This will ensure that the trial is appropriately timed and publicized when necessary.
- In consultation with faculty, the librarian will solicit feedback and evaluate the product based on the trial.
- The librarian will consult other subscribers to the product.
- The librarian will consult reviews of the product.

Based on cost, perceived need, usage, and the degree to which the electronic resource meets the selection criteria, the committee will: 1) decide whether or not to acquire and 2) if a decision to acquire is made, prioritize its purchase in relation to other electronic resources requested within budgetary constraints.

13. REVIEW OF ELECTRONIC RESOURCES FOR CANCELLATION

A subscription to a product may be cancelled if:

- Usage statistics are consistently low over a significant period of time.
- The content provided is no longer meeting the needs of users.
- The vendor fails to hold up their end of the agreement and/or provides poor service.
- A product's price inflates such that it no longer is considered affordable.
- The product's content is found to duplicate content in another database.
- A new vendor can deliver a superior product, including a more user-friendly search interface, providing greater and more reliable access at a reasonable cost, or meet other key criteria not being met by current database provider.
- The product is no longer cost-effective
- A competitive or better product becomes available (http://www.lib.colum.edu/about/ecollectiondevelopment.php)

14. GUIDELINES ON SELECTION OF FREE IN INTERNET RESOURCES

Free Internet resources may come in a variety of formats and document types, such as web pages, listservs, Usenet news, FTP sites, and full-text online versions of books, journals, and government documents. To supplement the breadth and depth of the libraries' collections, free internet resources which are deemed of value to the research and teaching of the university will be indentified and cataloged. While selection criteria from the general and subject policies prevail, the following specific

selection guidelines should be adopted. Links to those websites will be provided in the libraries' OPAC.

a. Selection Guidelines Specific to Internet Resources

- Information provided or created by an authority or reputable or reliable sources on the subject.
- Website is favourably reviewed by a reputable source.
- Site is accessible freely with browser/software and compatible with existing networked environment.
- Site is stable with infrequent down times.
- Policy of periodic review and update of content, with a date of revision statement for websites. E-books, journals, and other documents should have dates of publication or posting.
- Good design with visual appeal and easy navigation of contents within the site, e.g. site index or search engine.

b. Exclusions

- Commercial sites which are mainly advertisement or promotion of services or products.
- Other university/institute Electronic-Resources pages.
- Web sites or web pages of institutions, corporations, government agencies, and/or professional societies which contain largely promotional or newsletter type materials about the activities of the organization. Institutional websites/pages should only be included if there is a substantial amount of full text documents useful for the university's/institution's research and learning purposes.
- Websites deemed out of scope to our curriculum or level.
- Sites that require a user fee, or access to the content within the required fee.
- Portals which are merely links to hosts of other links but lack of organization and /or substantial annotations, as opposed to an organized and annotated series links which may be deemed useful as a subject bibliography.

c. De-selection Guidelines

- The resources are no longer available or maintained.
- Overlaps other resources which offer more comprehensive coverage or treatment of subject.
- No longer current, reliable or relevant.

d. Duplication

Internet resources which are duplicates an existing print resource is deemed acceptable if no fee is incurred and its inclusion provides greater access and convenience than the single point of access which a print resources provides. The web format is preferred generally, and print duplication is usually discouraged due to space and processing costs. The librarian will duplicate print resource with existing free internet resource when:

- One format is useable and retention is expected.
- The print format is needed for archival purpose due to its significant historical.
- Multiple formats meet the needs of different users.

e. Copyright for Internet Resources

In order to protect the libraries and its users from copyright infringement in establishing hyperlinks to internet resources, the following policy should be observed:

- Effort will be made to identify and acknowledge the owner/creator of the Internet Resources.
- Hyperlink to the material content will not be setup in such a way that the remote webpage or resource be brought within a frame under htt://lib.hku.hk, thus implying HKUL has created the resources.
- A disclaimer is placed on the Electronic Resources webpage, announcing who may link to our information, and to remove any of the hyperlinks made to remote webpage/resource if the copyright owner requests.

15. IMPORTANCE OF COLLECTION POLICIES FOR ELECTRONIC RESOURCES

Collection policy is a communication tool for management, librarians, and users. Policy means a set of guidelines designed and developed for a specific purpose. Policy is formulated with an organization's mission statement and strategic plan in mind. Good policy can ensure consistency of approach among staff and serve as a planning tool for managers. Librarians have entered the electronic era and need to devise a global access policy for information (Johnson, 1997).

All libraries have limitations in terms of money, space, staff and the same can lead to the frustration of library users. So, aspects like information explosion, literature cater, rising prices, technological evolution and inelastic budgets are the major hurdles in the way of electronic collection development and hence have given rise to collection development (Vohra, 1999).

The electronic resources are different from traditional library resources that a different kind of attention is needed from selectors. These are delivered in new and rapidly changing format. The technology and skills necessary to understand and use electronic information resources are different from traditional resources. Libraries need to policies to guide decisions about:

- Funding the infrastructure and about technical feasibility
- Negotiating licenses & price structures
- Selection of vendor, & its support and reliability
- Cataloguing and processing of electronic resources
- Intellectual access of electronic resources

Policy for electronic resources will specify who should be consulted and who has authority and responsibility for decisions. It provides a communication vehicle and provides institutional consistency. The different ranges of electronic formats are available due to the emergence of new technologies. CD-ROMs, Online databases, e-journals, e-books and the World Wide Web are relatively the recent developments.

16. CHALLENGES IN ELECTRONIC COLLECTION BUILDING

The following major challenges are face today in electronic collection building:

- Complicated procurement and preservation system
- Technological obsolescence
- Decentralization of library services
- Access related problems
- Intellectual Property Rights(IPR)
- Reliability and Authenticity

17. TRENDS IN ELECTRONIC COLLECTION DEVELOPMENT POLICY

The concept of what constitutes collection development Policy has changed and perhaps we should look for a new definition of the role of a librarian. We have moved from a time of huge resources to a time of largely static budgets with many more demands on these funds .This has shifted the focus of collection development from local collection building to more co-operative ventures and towards a heavier reliance on resource sharing (Jakubs, 1999). Main changes or the new trends, which have come on the forefront during the recent years, are detailed below:

- To attain efficiency there has been a move towards the use of approval plans as a means of acquiring current publications. It has changed the job of a selector. In fact most approval plans require a great deal of monitoring from the initial profile design to regular reviews of materials.
- In print environment, major publicity strategy of the publishers is providing complimentary copies to the teachers or libraries. This trend has changed in case of digital documents. In digital

environment to publicize the products, publishers generally give trial or complimentary access for a particular period to the institutions. The same is generally activated on the institute servers to be accessible to all through the LAN. Decision for purchase is generally taken after watching the document during the trial period.

- Net decrease in funding has led to reduced acquisition and has also required more careful selection of materials. After all, it is easier to spend a large budget than a small one. This has further added to the job of librarians, as has the need in recent years to conduct a large-scale serial cancellation. Redirecting a very significant portion of serial budget towards electronic access paid on an annual basis is another dominating trend in libraries.

- It has reduced the flexibility in our material budgets as a higher percentage of our budget is directed each year towards ongoing commitments or to continue the existing subscriptions.

- The collection development and collection management embraces two information systems i.e. print and digital. In the libraries of some reputed institution like IITs, information and communication technology was adopted at an early stage and has adopted separate techniques suitable for development of both print and electronic collection.

- Establishment of institutional repositories in a number of internationally reputed institutions like IITs, IIMs, DRTC, and INSA etc. is another positive trend in the electronic collection development in India.

- Change in the role of librarian: The very important role that emerges from our librarians is a redefinition of their role as information mediators. To make these role even more important, librarians need to add value to the information as it moves through this chain.

18. COLLABORATIVE COLLECTION DEVELOPMENT

Laxman Rao (2006) has appropriately depicted the need for consortia- "Library consortia have been formed to deal collectively with the problems of purchasing online products, to benefit from the best possible volume pricing, and to secure the best terms of agreement from online publishers". Collaboration in library collection development is becoming indispensable medium to serve the needs of users with a view to:

- To avoid unnecessary duplication of materials;
- To acquire library materials purposively within the constraints of a limited budget;
- To facilitate accountability to external agencies;
- To develop specializations locally; and
- In response to the fragmented and uncoordinated acquisition of library materials the need for collaborative collection development is increasing day by day. In India one after the other consortia is taking place like INDEST consortia, UGC-Infonet etc. Outsourcing and Electronic Data Interchange (EDI) is gaining importance and has been suggested as a solution to shrinking financial and human resources by many experts in this field. In almost all libraries people are opting outsourcing for in-house activities of the libraries.

19. CONCLUSION

Libraries are still essentially information providers. In order to continue to provide relevant collections at the time of need, library personnel need a shared frame of reference regarding the criteria determining how we make decisions about resources, who informs decision-making, how those decisions are implemented, and what we expect from vendors. Although the library profession is well aware of the changes that electronic resources bring to libraries, there is not a lot of research on how collection development policies should guide electronic resource management. In the library collection, e-resources has become the buzz word, which on one hand and the development and impact of the technologies on libraries where as on the other hand, pose new challenges for library professionals to manage the electronic information resources properly. University, the top most higher education institute also changing their collection from print media to e-resources very rapidly to fulfill the requirement of their user community. In today's electronic environment, the librarian must act as a

knowledge manager, applying the skills of collection planning, selection, analysis and cooperation in order to manage the intersection of print and e-resources. They need to think about the availability and accessibility of multiple electronic formats in order to deliver the best information to all users in the least possible time.

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COLLECTION DEVELOPMENT OF ELECTRONIC JOURNALS AND ITS IMPACT ON RESEARCH PUBLICATIONS : AN OVERVIEW OF THE UNIVERSITY LIBRARIES OF ODISHA

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1. INTRODUCTION

Electronic resources are documents in electronic form or that can be accessed via electronic transmission and include books, journals, newspapers, magazines, archives, theses, conference papers, examination papers, government papers, research reports, scripts and monographs. These resources have become critical part of the learning environment, particularly in the higher education, and bring tremendous benefits to organizations and individuals to perform their work more effectively and efficiently. The benefits of electronic journals have been well documented.

Electronic journals are the periodical publications where the end products are made available in electronic formats available online. Most of the academic and research libraries have changed their traditional outlooks towards the functions and services they have rendered. The atmosphere is rapidly shifting to the electronic one and the use of electronic journals is the most accepted resource for research. With the increasing of electronic journals, high rise cost in print journals, and the reducing budget of libraries by the funding parent organization forced the libraries to form an alternative model of resource sharing where a multiple access of the electronic journals are possible with no geographical boundary in a few seconds via the internet.

2. DEFINITION

A good starting point for any study is to find a definition to work with for the remainder of this study; however, the electronic journal, or e-journal, as it is becoming popularly known, proves indefinable in the major reference dictionaries. Definition offered by the Colorado Alliance of Research Libraries: "Electronic serials may be defined very broadly as any journal, magazine, e-zine, webzine, newsletter, or type of electronic serial publication which is available over the Internet. Within this broad definition, the titles can be electronically accessed using different technologies such as the World Wide Web (WWW), gopher, ftp, telnet, email, or listserv."

A bibliographic database is a 'database of bibliographic records, an organized digital collection of references to the published literature, including journal and newspaper articles, conference proceedings, reports, government and legal publications, patents, books, etc. In contrast to library catalogue entries, a large proportion of the bibliographic records in bibliographic databases describe articles, conference papers, etc., rather than complete monographs, and they generally contain very rich subject descriptions in the form of keywords, subject classification terms or abstracts" (Wikipedia, n. d.).

3. SCOPE AND LIMITATIONS OF THE STUDY

The present study confines to only three oldest general universities, namely Berhampur University (BU), Sambalpur University (SU) and Utkal University (UU) which have the facility of Electronic journals under UGC-Infonet programme in the year 2005. However, the study does not cover other universities of Odisha. Impact of the Electronic Journals on Research Publications for the period 2005 to 2010 has been analysed using the SCOPUS bibliographic database.

4. GROWTH OF ELECTRONIC JOURNALS

There was an unprecedented growth in the number of electronic journals in the current preceding years. The 7th edition ARL (Association of Research Libraries)' Directory of Electronic Journals, Newsletters and Academic Discussion Lists shows that in 1991 the total number of electronic journals were 110+, in 1995 it goes up to 675+ and it further increased to 3414+ by the year 1997. Up to the year 2008, there were 250,000+ electronic journals available globally in the field of science, technology and medicines. It also includes the humanities, social sciences and management. According to Wikipedia today the estimated scholarly electronic journals available for usage is around 3,36,000+ or more number of volumes (Mogge, 1999).

The growth of electronic journals is shown in the table:

Table 3.1 Growth of Electronic Journals

Year	No of Electronic-Journals
1991	110+
1995	675+
1997	3414+
2008	250000+
2013	336000+

5. TYPES OF ELECTRONIC JOURNALS

There are various types of journals, available electronically. Electronic journals are primarily divided under two broad groups: Full-text and non full-text. The full-text may be either e-version of print journal or e-only journal. Non full-text journals may be of three types such as partial text, index or table of content. So the electronic journals are primarily of two types, first one is journal which is also available in print and the other one is the journal available only electronically in digital form. These electronic only journals are solely available via the Internet Online as well as through CD-ROM.

- *Online journals*: These journals are available pay per access and through subscription (i.e. yearly or long term subscription).
- Some journals or e-databases published and distributed through CD-ROM/ DVD-ROM/ Dongle etc. via internet with regular updates from time to time which have some inbuilt search retrieval mechanism.

6. ADVANTAGES OF ELECTRONIC JOURNALS

Some of the important advantages of the electronic journals are:

- **Speed:** Electronic journals allow more speed in the scientific communication process. Electronic of current journals are published early on the internet than their printed counterparts many times as much as weeks ahead.
- **Multiple Accesses:** It is possible to add experimental data, software and even multimedia extension link simulation.
- **Shelving Space:** Electronic journals do not need any physical space and shelving or it cannot be stolen from the library.
- **Availability:** Electronic journals are available 24X7 hours.
- **Merging:** Electronic journals can be easily merged with alerting services.

- **Maintenance:** Economy in maintenance.
- **Delivery:** E- Journal can be delivered directly from publisher to the user's desktop.
- **Distribution:** The major benefit of electronic journals is their global distribution, their hypertext links and ability to search.
- **Retrieval:** Most of the publishers of electronic journals are providing key words, author search, thus reducing the role of additional indexing and abstracting.
- **Downloading:** Electronic journals provide the facilities of downloading the appropriate articles at the end users workstations.
- **Printing:** Articles can be printed directly from systems as it is very simpler, cheaper and gives better results.
- **Direct Access:** The user need not go to the library and make copies from electronic journals. They can get the access of the full text article from their desktop from anywhere.
- **No Physical Boundary:** Access to full text articles can be made at any time and any place
- Quick retrieval: Searching and retrieval of electronic journals are much faster as compared to printed one.
- **Remote Access:** Users can access the subscribed electronic journals off campus anywhere in the world through authentic remote login system.

7. DISADVANTAGES OF ELECTRONIC JOURNALS

- The main disadvantage of electronic journals is that, it needs a special device to read i.e. a Computer monitor.
- In case of printed journals, printing text remains unchanged, thus finding them again is easy. However, in case of electronic journals, websites or URLs are kept on changing frequently.
- With regards to printed journals, the subscriber pays for a copy of an issue, receives it, can store it or lend it when required, while in case of electronic journals, subscribers pay for access, as soon as the subscription expires, accessing it online is not possible. However, if permissible, one can print copies of articles or down load them for archiving.
- Electronic journals are searched for a specific requirement and therefore tend to be more targeted.
- Use of electronic journals can lead to the decrease in the foot fall of users to the library.
- It is found that in some cases electronic resources hampers the social and physical interaction with the colleagues.
- Scientists feel that the Internet has severe restrictions, since information may not be consistent, supply is irregular, and electronic resources are more constrained compared to print.
- There is a lack of sufficient training, learning and safeguarding; slow network speed; incompatibility between formats, lack of infrastructure; poor facilities for viewing or printing good quality articles.
- For accessing electronic journals high speed internet service is essential.

8. ACCESS MODE

Currently the electronic journals are mostly accessible online through authenticated IP based model. Also available are the user ID and Password based but it should be the second choice only. There are various other technology available such as the remote access where the subscribed resources can be accessed remotely anywhere in the world through IP based or by user login ID and password. Also the Offline databases in CD-ROM/DVD-ROM (one time installation required) or using Dongle authentication for accessing in dedicated systems. As regards to the access of online journals, various subscription models available such as current only subscription, where only the current year subscribed resources are accessible. Current subscriptions with back access of 10 to 15 years (varies with the publishers), and perpetual access where the access will be made available for the period of subscription even after the discontinuity of the resources.

However, these all points need to be mentioned in the license agreements signed between the

publishers and universities. Archival access is available for back issues with different bundles of 10ys, 20yrs, 30yrs….. and complete package etc. Archival databases are paid onetime payment only. However, the archival access does not cover the period between the current subscription and the back access of 10 to 15 years depending on the publishers.

9. SELECTION AND ACQUISITION

The responsibility of the selection of electronic journals rests upon the librarian and the faculty members with the guidance of the Library Committee and the Vice-Chancellor. The recommendations of subject experts in appropriate disciplines are considered according to established selection procedures. The process of selection of electronic journals resembles that of other periodicals. Some special considerations unique to electronic journals those should be concentrated on by the libraries are: subscription method, ordering practice, standards, and usefulness of search engines, access authentication, and the software & hardware compatibility. The selection policy should include: technical feasibility like access (remote or within campus), authentication (IP based or user ID & password based), hardware and software compatibility & availability; functionality and reliability such as, retrieval, downloading, exporting, and printing; vendor support such as training, tutorials, customization; supply and delivery such as purchase models, access options, archiving etc.

10. COLLECTION DEVELOPMENT OF ELECTRONIC JOURNALS IN UNIVERSITY LIBRARIES OF ODISHA

UGC-Infonet Electronic Journals Consortium: The UGC- Infonet Digital Library Consortium which was launched in 2003 as specified in details at chapter one so far providing service to the 195 universities comes under the purview of UGC, have provided with differential access to the subscribed e-resources in almost all disciplines except the technology and engineering. The success of the UGC-Infonet has led to a demand for extension of the consortium resources other than the UGC supported institutes on 'Associate membership scheme' in 2009 with an aim to extend access to e-resources subscribed for private institutes as well as research funded institutes. In this associate member scheme, so far 204 institutes have enrolled and are subscribing to UGC-Infonet e-resources. The programme is funded by the UGC for universities under its purview and monitored by the INFLIBNET (Information and Library Network) Centre, Gandhinagar and is finally the project is closed on 31st March 2012.

Berhampur University, Sambalpur University and Utkal University were one of the 50 universities identified in the Phase II by the INFLIBNET Centre for providing access to scholarly Electronic journals through UGC-Infonet Electronic journals Consortium. Though the Electronic journals access to universities is intended to be provided from 1st January 2004, the universities started receiving electronic journals from January 2005. At present, the university research community is able to access over 6000 electronic journals in their respective University Campuses with the total number of e-resources products in Berhampur University (12), Sambalpur University (19) and Utkal University (19) respectively. Internet connectivity and IP based access to electronic journals have been provided initially to these universities under the UGC-Infonet programme through VSAT provided by ERNET at a bandwidth of 256Kbps. Formally in 2010, the VSAT have been replaced and upgraded with an increasing bandwidth of 10 Mbps through BSNL leased line to facilitate the e-resources services intending a faster and effective utilization.

11. E-RESOURCES AVAILABLE UNDER UGC-INFONET AND ACCESS PROVIDED TO UNIVERSITY LIBRARIES OF ODISHA

Full-text e-resources and bibliographic databases available through UGC-Infonet Consortium are mentioned as under:

Table 3.2: E-Resources available under UGC-Infonet and University Libraries of Odisha (INFIBNET, n.d.)

Sl. No	Electronic Resources/ URL Address	No. of journals	No. of Univ.	Odisha University		
				BU	SU	UU
1	American Chemical Society http://www.pubs.acs.org	37	103	Y	Y	Y
2	American Institute of Physics http://www.aip.org	18	105	Y	Y	Y
3	American Institute of Physics Archive http://www.aip.org/digital_archive.html	NA	NA	NA	NA	Y
4	American Physical Society http://www.aps.org	10	105	Y	Y	Y
5	Annual Reviews http://arjournals.annualreviews.org	33	103	Y	Y	Y
7	Cambridge University Press http://journals.cambridge.org	224	115	Y	Y	Y
9	Economic & Political Weekly http://epw.in	1	All	Y	Y	Y
10	Emerald Lib. Sci. http://www.emeraldinsight.com	29	67	NA	Y	Y
11	Hein Online http://home.heinonline.org					
12	Institute of Physics http://www.iop.org/EJ	46	113	Y	Y	Y
13	JSTOR http://www.jstor.org	1401	106	NA	Y	Y
14	Nature http://www.nature.com	1	56	NA	NA	NA
15	Nature Archive (1987-1996) http://www.nature.com	NA	NA	NA	NA	NA
16	Oxford University Press http://www.oxfordjournals.org	206	118	Y	Y	Y
17	Oxford University Press Archive http://www.oxfordjournals.org	NA	NA	NA	NA	NA
18	Portland Press http://www.portlandpress.com	8	57	NA	NA	NA
19	Project Euclid http://projecteuclid.org	22	57	NA	NA	NA
20	Project Muse http://muse.jhu.edu/journals	411	101	NA	Y	Y
21	Royal Society of Chemistry (RSC) http://www.rsc.org/Publishing/Journals	29	104	Y	Y	Y
22	Royal Society of Chemistry (RSC) Archive http://pubs.rsc.org/en/journals?key=title&value=archive	NA	NA	NA	NA	NA
23	Science Direct (10 subject collection) http://www.sciencedirect.com/	1036	60	NA	Y	NA
24	Science Direct Archive (Basic Sc Collection) http://www.sciencedirect.com/	NA	NA	NA	NA	NA
25	SIAM Journals http://epubs.siam.org	14	50	NA	NA	NA
26	SIAM Locus Archive http://locus.siam.org					

27	Springer Link http://www.springerlink.com	1389	171	Y	Y	Y
28	Taylor & Francis Bibliographic databases http://www.informaworld.com	1365	124	Y	Y	Y
29	Westlaw India http://www.westlawindia.com	NA	NA	NA	NA	NA
	Wiley-Blackwell http://www3.interscience.wiley.com/	908	102	NA	Y	Y
Bibliographic Database						
30	ISID http;//isid.org.in		NA	Y	Y	Y
31	JCCC http://jccc-infonet.informindia.co.in		All	Y	Y	Y
32	MathSciNet http://www.ams.org/mathscinet		57	NA	NA	NA
33	SciFinderScholar http://www.cas.org/SCIFINDER/SCHOLAR/index.html		23	NA	NA	NA
34	RSC Databases (6 Databases) http://www.rsc.org		104	NA	NA	NA
35	Web of Science http://apps.isiknowledge.com/		NA	NA	Y	Y

12. IMPACT OF ACCESS TO ELECTRONIC JOURNALS ON RESEARCH PUBLICATIONS

An assessment has been made from the data indexed and reflected in SCOPUS database and is presented in the table 4.28 in blocks of five years starting from 1994 to 2013 of the three universities namely Berhampur University, Sambalpur University and Utkal University. The data shown are the overall contribution of the research articles/papers from all the disciplines by the researchers of the respective university on a five year block. It is found that in the first block of five years i.e. 1994-98, the contributions from Utkal University (UU) were 326 numbers, followed by Berhampur University (BU) 123 numbers and Sambalpur University (SU) is 114 numbers. During the period 1999-2003, the total contributed articles were UU (334), BU (151) and SU (130). For the period of 2004-08, contributions from the universities were UU (321), SU (155) and BU (138). In the last block of five years i.e. 2009-13, data uploaded in SCOPUS revealed that UU, BU and SU have 463, 320, and 296 numbers respectively. In all these years it is found that Utkal University ranked first with 1444 papers, followed by Berhampur University with 732 papers placed in 2nd position and Sambalpur University with 695 papers took the 3rd position. However in the block year 2004-08, Sambalpur University contributions were slightly better with 155 papers and placed at 2nd position. From the figure 4.12, it is observed that there is a sharp increase in the number of publications after the implementation of UGC-Infonet in 2004.

Table 4.28: Impact of UGC-Infonet on publication using SCOPUS

Year	BU	SU	UU	Cumulative Total	Cumulative Difference
1994-98	123	114	326	563	
1999-2003	151	130	334	1178	615
2004-08	138	155	321	1792	614
2009-13	320	296	463	2871	1079
Total	732	695	1444		
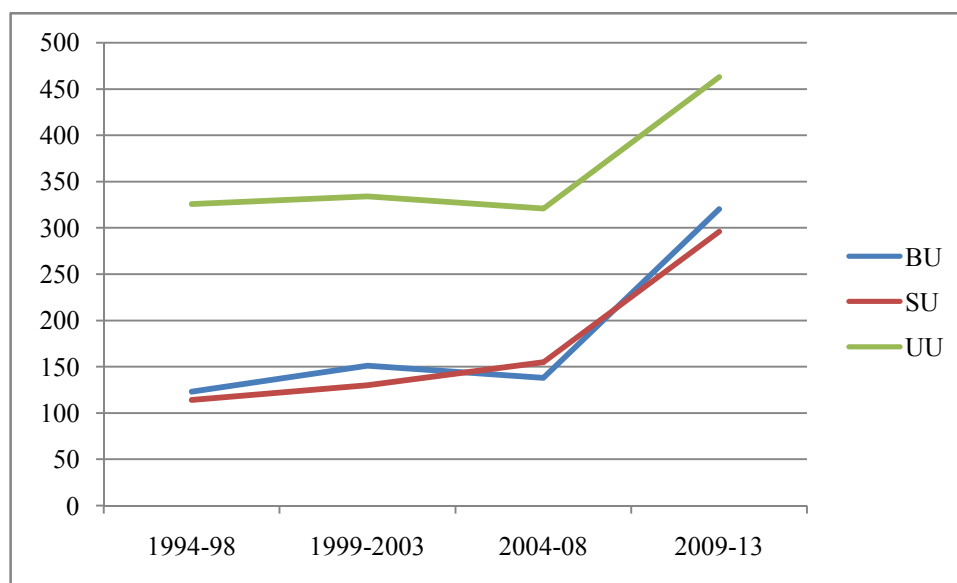
Fig. 4.13: Impact of UGC-Infonet on publication using SCOPUS

13. CONCLUSION

The sprouting telecommunication infrastructure and information technology can provide better access to the internet and electronic journals among the academic community of the institutions. Growth of the internet and electronic journals are two side of a same coin and hence both cannot be separated with each other. In the advent of the newer technologies, exponential growths of electronic journals have been seen globally. University Libraries of India which are funded by MHRD Govt. of India and managed by the INFLIBNET Centre Gandhinagar, Gujarat are the core category of users accessing the electronic journals. The real problem lies with the rural institutes, state universities and poorly funded institutes where the digital divide and inequitable access still exists. Especially a state like Odisha has yet to adopt a policy of providing universal and equitable access to the internet and electronic journals for the University Library. The electronic journals bring in many exhilarating openings and potentials for the scholars in the academic libraries. Use of electronic journals has many advantages as well as disadvantages. The paper also discussed major issues like types, access mode, selection and acquisition of electronic journals. Also enlighten on the collection development and growth of electronic journals in Universities Libraries of Odisha. This paper provides an introductory aspect about full text electronic journals and bibliographic databases. It is observed that there is a sharp increase in the number of publications after the implementation of UGC-Infonet and availability of electronic resources to the Universities Libraries of Odisha.

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COLLECTION, DEVELOPMENT AND CONTENT MANAGEMENT IN AN INFORMATION TECHNOLOGY BASED ENVIRONMENT : CURRENT INITIATIVES AND ISSUES

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1. INTRODUCTION

The emergence of information and communication technologies (ICTs) has made dynamic changes in the structure and functioning of the library and information centres in the present day information environment. Traditional library system has been transformed into e-learning and virtual learning system. In order to ensure utmost use of information resources for remote users, there is a dire necessity of digitizing those resources and making them available through the web.

The most striking feature of such a digitization procedure is to create digital contents because without creating contents in digital forms, libraries will not be able to provide services in electronic formats. There is no doubt, that some advance libraries have started to provide contents in digital formats and taking steps as to how the contents are converted into digital formats and made available on the network, CD-ROM and other services where hypertext format is of utmost use.

2. DIGITIZATION OF SCIENCE AND TECHNOLOGY INFORMATION

Digital technologies and online information resources have brought fundamental changes in how the research is done. The most important component of digital library, however, is its digital collection. The information content of a digital resource includes virtually any kind of electronic media (text, image, graphics, video etc.), licensed database of journals, articles and abstracts. Before developing a digitized system, it is pertinent on the part of the information specialist to determine the target users groups and their needs. For example, Agricultural information users are agricultural scientists, faculty, researchers, students, extension workers, farmers, policy makers, administrators and industrialists. Another important aspect is the users' competency of using digitized information. The information specialist has to fully ensure that those users coming under ambit must be aware of such digitized information use so as to help develop a successful digital library. Digitization is the answer to high cost involvement in the duplication of resources in all the libraries. It facilitates live and interactive access to wide variety of content online. It is an ideal solution for budget constraints, staff crunch and space limitation for growth. Valuable archives owned by libraries are required to digitize so as to allow online access to researchers, teachers and students to which they would not otherwise have easy access. DRDO is a premier science and technology organization, committed to indigenous development of various products for Services. The information needs of scientists are vast and encompass various disciplines. A short preview of information management is presented here.

3. JOURNAL SEARCH

Defence Science Library subscribes to a good number of journals in the field of Science and Technology. The current journal search option allows searching journal details subscribed during the

current subscription period and back issues. The back volume search option allows searching back volumes of periodicals available at Defence Science Library in bound form.

4. ONLINE E-BOOKS REQUISITION

An electronic book (e-book, digital book, or even e-edition) is a book-length publication in digital form, consisting of text, images, or both, and produced on, published through, and readable on computers or other electronic devices. E-books are usually read on dedicated e-book readers or tablets using e-reader applications. Personal computers and many mobile phones (smart phones) can also be used to read e-books.

5. ONLINE REPOSITORY

DRDO has developed a DRDO Knowledge Repository (KR). The knowledge repository aims to act as a central online repository of DRDO technical reports. This is an online tool which enables DRDO scientists and professionals to have easy and seamless access to the vital information contained in the technical reports brought out by the various labs/estts. of DRDO over the years.

6. NEWS PAPER CLIPPING SERVICES

To keep the top management abreast of latest developments that have relevance to Defence R&D, Information Services Division provides a daily newspaper clipping service. This service includes the scanning of 17 Indian (English and Hindi) newspapers. Clippings are selected, marked and arranged on the following topics of interest: Ministry of Defence, DRDO, National security and Defence policy, Science & technology, International news, other news items on Defence science and technology. Newspaper clipping database is updated daily online.

7. RESEARCH PUBLICATIONS

DRDO has a bibliographic database of research papers published by DRDO scientist in various national and international journals/magazines or presented in seminars/ Conferences etc by full text wherever available.

8. IEE/IEEE CONTENT INDEX

As a subject of current contents it covers contents of about 130 periodicals published by IEE/IEEE. These can be accessed on intranet.

9. CURRENT LITERATURE IN DEFENCE SCIENCE & TECHNOLOGY (CLDST)

CLDST is current awareness service brought out by Library every month since 2001. It provides subject wise bibliographic details of the articles pertaining to new scientific research technology, product reviews and editorials published in leading scientific, technical and military science journals subscribed by Library.

The service is meant to keep the DRDO scientist abreast with the latest development taking place in Defence S & T areas. The service keeps adding full text to some of the interesting articles for reference from current issues as well as from archives.

10. TRANSLATION DATABASE

It is bibliographic database of S&T translation done at Library from foreign languages like Chinese, French, German, Russian, Hungarian, and Swedish etc. into English. The database can be searched by title, subject, author, keywords, source publication etc. Copies of the translations can be supplied on

demand also.

11. COLLECTION MANAGEMENT FUNCTIONS

- Planning and policy making a formal Collection Management Policy statement and preparation of an actual Collection Management Plan according to the statement.
- Collection analysis strengths and weaknesses according to objective measures using some tools.
- Selecting materials according to Collection Management Planning.
- Making decisions on which to materials to preserve, weed, replace, and store in order to serve the current and future needs.
- Active participation in acquiring a materials budget and allocating it effectively.
- Interaction with all types of library users and formal study of library users and their patterns.
- Establishing cooperation and communicate on with other local, national, and international libraries for resource sharing.
- Evaluating collection management plans, policies, procedures, and personal by use and user studies to revise plans and policy documents for collection management.

12. ROLE OF LIBRARIES AND LIBRARIANS

In present changing scenario, libraries and librarians will continue to play an important role in handling traditional/conventional and electronic resources. Libraries must be quick to recognize and realize the advantages of IT and must try to adopt it for their operation. IT is a crucial consideration as it has an impact not only on the organizational structure, but also on the library purpose and service.

13. CONCLUSION

The modern library systems and services have developed the mechanisms of content creation and management in digital formats, which would be available in the networked environment. A consortium of e-resources in DRDO has already been working successfully. It is because digital content creation has become the necessity of today's information dissemination process. Libraries have to develop the necessary infrastructure for content creation and management, develop metadata harvesting and adopt content management operations.

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COLLECTION DEVELOPMENT AND MANAGEMENT OF E-RESOURCES : ISSUES AND CHALLENGES FOR LIBRARIANS IN DIGITAL ENVIRONMENT

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1. INTRODUCTION

The publication of human intellect in recorded form and its availability and use in a common platform like library accelerates the users' knowledge. The library since the dawn of its civilization has been recognized as a viable platform to disseminate the same to its patrons through collection of such literature. The growth and development of the university and society thereby, solely depends upon the collections which however, are accumulated through purchase, gratis, donations, self contribution of personal belongings, institutional records etc. Collection Development in the library happens to be one of the pragmatic activities of the library under certain guiding principles. The strength and weakness of a library is judged through its collections as it reflects on the users. The central universities are one among the other elite institutions in India who strengthen the libraries with need based collections both in traditional and electronic forms to fulfill readers' requirements. Though print forms of documents have its own identity, e-resources also substantially add mammoth value in research especially in Information and Communication Technology (ICT) environment and the libraries in such a scenario add value oriented collections of e-resources which are the most preferred sources of information. In other words, it can be reckoned that, there has been a radical change in the policy involved in the collection development of the library due to the availability of new media of communication other than print on paper for storage, communication and transmission of information. It goes without saying that, Information and Communication Technology opened new multiple vistas for the library to conglomerate intellectual wealth both in tacit and explicit form so as to extend wide range of services to the patrons. This also has become imminent on the part of the libraries due to growth of literature and awareness among the users. Adaptability of Information Technology in Libraries altered the complexion of present library scenario. Library has no longer been regarded as a store house of knowledge but become an effective platform to disseminate information in electronic form. With the development of automation and computing and a knowledge society, libraries have evolved to become information generator and provider as well rather than an information accumulator. Added to this, the Internet technology added new and admirable features for the library to provide electronic information to the users. World Wide Web (WWW) and emersion of elevated web browsers have provided viable platform for interface between the system and the users for retrieving mammoth data irrespective of the areas and subjects. This not only added value for the users for teaching, learning and research but also substantially incorporated sufficient input in collection development with regard to e-resources in the library and its management through database for retrieval and preservation The development of e-collections is to maintain the ability for storage, retrieve and use information in the face of rapidly changing technological and organizational infrastructures.

2. IMPORTANCE OF COLLECTION DEVELOPMENT POLICY

Collection Development especially in academic libraries requires certain guidelines and principles as it accentuates the inequalities of the collections and brings about the strength and form the basis of confidence among the professionals to provide the services to its patrons. The collection development, being central for various academic departments in the library, however rests on the recommendations of the faculties who prepare an authentic and constructive list of reading materials pertaining to curriculum and to support the teaching, learning and research and submit the list to the librarian who exercises his intellect in determining the duplicate. The acquisition section of the library in addition to the recommended list of the faculties also take into cognizance the suggestions of the students and on the basis of the budget, finally constitute the list for onward action in the matter.

It may be mentioned that for a sustainable and healthy documents collection, a consistent collection development policy is impediment as it provides the ground realities for framing a constructive planning, utilization of the budget, selecting qualitative documents for maximum utilization etc. It also provides a basic framework for coordinated collection development programme in the university library (P. Olatunji Olaojo, and M. A. Akewukereke; 2006). According to Eguavon and Ochai, a collection development is a planned, systematic development of a collection based on the objectives of the library (P. Olatunji Olaojo, and M. A. Akewukereke; 2006). In this perspective, it is viewed that, a sound and consistence collection development policy not only act a guiding principles for accumulating the user centric resources but also helps the other libraries to take same stand in developing their resources. Moreover, it also performs as an indicator of strength and weakness of the resource collection of the library. Even if, there is a universal practice for the academic libraries in collection development it however, differs to some extend in the academic libraries of developed countries. While tracing the collection development policy in University of Texas) it can be discussed that, the university library amasses materials in all formats to suit to the need of the patrons with special emphasis on teaching and research. Further, importance is bestowed upon acquiring current materials, with a special emphasis on increasing access to online scholarly resources (http://www.lib.utexas.edu/admin/cird/cird.html so as to provide the same to its patrons online.

Likewise, the University of Georgia Libraries (http://www.libs.uga.edu/colldev/cdpolicy.html) in its mission statement regarding collection policy adverted that, the university library primarily focuses on services in support of the instructions, research and hence, develop collections both print and electronic form in a wide range of formats not only to the patrons but also to the public. Similarly, IFLA (http://www.ifla.org/files/assets/acquisition-collection-development/publications /gcdp-en.pdf) in its collection development policy also equally emphasized on electronic journals other than print provided that,

- Access to the electronic resources is equal to the print resources;
- Access to the patrons are provided through adequate terminals; and
- No additional information cost to the patron.

In this way, most of the university libraries in the international scenario have their own collection development policies. However, the universities in the developed countries have given emphasis on electronic sources and accordingly have developed sound collection policy on e-resources. Mention may be made that, Florida Gulf Coast University Library equally has collection development policy where, the Library adopts the latest acquisition technologies, the expertise of academic faculty, and the education and experience for collection of resources of professional librarians to assure materials collected meet programming requirements (http://library.fgcu.edu/CSD/Policies/collection%20development%20policy%20rev%202014_0201.pdf). A list of such universities having the sound collection development policy has been provided in Appendix-1.

Further, the National Knowledge Commission (NKC) in 2007 also has categorically mentioned about the collection development to meet the users' demand. The NKC apart from other recommendations stresses on (a) Maintaining of a well-rounded core collection, including reference material to satisfy

the regular needs of its user community, (b) Developing of networks, and e-resources, to achieve better qualitative and quantitative standards, and (c) Acquiring of dynamic resources to ensure that the collection remains relevant to the user communities (http://knowledgecommission.gov.in/downloads/documents/NKC_Library.pdf)

3. SELECTION CRITERIA -PRINCIPLES

It is the onous of the concerned library to develop a healthy and sound collection which include both traditional and electronic. While selecting the traditional documents, invariably the publishers' catalogue available in print and e-form are looked up to determine the latest publication in the subject where the faculties play a crucial role in determining the useful materials based on curriculum and the librarian in consultation with the members of the library committee or the members empowered by the committee finalize the list subject to available budget. During finalization process, the students' representative gives a nod to the selection who takes the responsibility to protect the students' interest. However, electronic resources, the need of the hour requires certain sound guidelines while finalizing the list of resources as they are not available in print form and such resources can be accessed through direct link from the publishers' database or through consortia, CD form etc.

E-resources have become imminent in the present environment in all academic libraries and R&D libraries as electronic resources are gaining momentum among the faculties, researchers and the students as well. The e-resources are having equal importance in the collection development in libraries due to its update; instant, wide coverage etc. and prosperous collection of e-resources regardless of media reflect the academic priorities (http://www.lib.umd.edu/collections/policies/electronic-resources) in the higher education level resulting to a high productive value in teaching and research. Like traditional collection development policy, many university libraries in the developed countries have also adopted the policy in accumulating e-resources. It could be visualized from the University of Maryland, US that, it has got the constructive and dynamic collection development policy of e-resources where, the libraries are committed to take leadership in providing qualitative e-resources support to support teaching and research. While selecting the e-resources, the library gives attention to the review and approval process, addresses issues concerned with licensing, access vs. ownership, developing industry standards, and physical location of resources http://www.lib.umd.edu/collections/policies/electronic-resources). The collection of e-resources comprises CD-ROM, interactive multi-media, machine readable bibliographic, non-bibliographic and full text databases, software, E-journals, and other materials accessible on the Internet and elsewhere. According to Gorman (1997) the cost effectiveness of library collections concerned in the 1970s, the budgetary crunches concerned in the 1980s, and the understanding of electronic library materials began in the 1990s (Paul, 2011).

4. E-RESOURCE SELECTIONS- PARAMETERS

Change is inevitable in every walk of life and changes in the library services are no exception to it. The library in the present era witnessed dynamic changes in its services due to adaption information and communication technology and this is supplemented with the changes of information requirements of the users who insisted upon the e-resources. All electronic materials must be pertinent and suitable to a significant segment of the patrons of the library and suit to the changing academic needs leading thereby, to fulfill the objectives of the organization. Moreover, extraordinary concentration to the procurement of electronic resources must be initiated for the high-priority subject areas apart from the other subjects for sustainable research. Hence, to satisfy the ultimate need of the users, the library requires adopting certain parameters while considering procurement of e-resources.

Allocation of Budget: It is one of the indispensable components of the library to earmark the finance against the procurement of e-resources which include e-journals, e-books, database etc. Priority in the event of users' need for e-resources must be dispensed along with necessary infrastructures.

Technology Support: This component is crucial as e-resources can only be accessed with computers

along with necessary hardware and software which may include both proprietary and open source. Other essential infrastructures to support the access of e-resources also equally must be acquired to help the users for uninterrupted access of e-resources.

Information Literacy: Information literacy forms the basis for lifelong learning which is common to all disciplines, to all learning environments, and to all levels of education (Mishra & Mishra, 2010, 48-54). It has a practical implication among the library professionals including the users which however, later is concerned with access while former is concerned with selection, acquiring, expertise in management, creation of database, analysis and other technical processing of the resources for instant delivery of information. The library professionals are generally tuned to the users need and conversant with the technology including information sources that can better assess the mechanism for acquiring the e-resources along with legal implications. According to Doyle (1992), information literate person in 21st century need to,

- Recognize the need for information;
- Locate required information;
- Formulate questions based on information needs;
- Identify potential sources of information;
- Develop successful search strategies;
- Access sources of information including computer-based and other technologies
- Evaluate information no matter what the source;
- Organize information for practical application;
- Integrate new information into an existing body of knowledge;
- Use information in critical thinking and problem solving; and
- Use information ethically and legally.

Hence, in the light of above discussions, the library professionals requires developing competencies and skills for sound collection of e-resources including its proper management for use by the patrons and preservation. Further, the library professionals need to gain the other dimensions of information literacy such as, Network Literacy, Media Literacy, Digital Literacy, Scientific Literacy, Visual Literacy, Critical Literacy etc. for effective functioning of e-resources in the library.

Training and Orientation: Regular training among the library professionals increase the efficiency in managing the e-resources and it is essential to tune to the new technology including change of software. Equally orientation program is also impediment for the users so as to make the best use of e-resources uninterruptedly.

Varying Format: The publishers in view of the rising cost in publication, manpower, stationeries, transportation changed the modalities for delivery of print documents to electronic means through e-journals, e-books etc. Moreover along with the print documents, the publishers or aggregators promote the e-book service through CD-ROM. Further, the library due to multiple reasons as discussed above, accumulate the e-journals directly through publishers, consortia, aggregators, organizational and commercial websites, open source etc. But, with regard to e-books even there are websites who deliver free service are not adequate to meet the demands of the users and hence, compelled to acquire e-books for the patrons. In such cases, the library in a hybrid system acquires both traditional and e-books but in a digital library system, the library prefers the e-books only which may or may not satisfy all categories of the users. Hence, before adopting the principle for e-book procurements against the print documents, the library needs adjudicating the matter to keep away from any inauspicious incidents.

Licensing: It is one of the pragmatic components in accessing the digital materials. Licensing agreements between the information creator and information provider has become a vital issue in view of the upcoming of electronic information where, the publishers act as an information creator and libraries as information provider or disseminator. With the introduction of electronic information

a wide range of conflicts between publishers and libraries have started to occur which resulted the librarian to face with challenging assignments like, signing the licensing agreements, where the information generator (via a secure network) and the information purchaser come close together to make arrangement, deal-by-deal, resource-by-resource. However, the task of negotiating licenses is becoming more complicated with diverse nature in delivery modes, access possibilities, and spiraling pricing practices (concessions) to electronic resources by the publisher/vendors. Therefore, the type of agreement between information provider and library consortia and between the library consortia and consortia members can have a major impact on the consortium's effectiveness. Haavisto (1999) identified the minimum contents of a library consortium agreement (between the 'Consortia and Members') are, partners, purpose, acquired resources, usage rights, share costs, legal practices, responsibilities, unexpected situations, terms and termination, etc. This consortium would provide strength to its members, to negotiate with electronic publishers for the best possible price and rights. Agreements should be made to provide access the licensed resources either directly through publisher's site or through the mirror site created by the consortium, depending on the cost, communications, connection speed, geographical locations and number of constituent members, etc. Consortia members may have to form 'sub-consortia', to pay the subscription fee (obviously discounted) or as per their requirement. In view of the best terms and conditions of License Negotiation (between the Information provider and Consortia), the PLACON-Board of Directors and Management Committee would take care of the following issues such as, subscription period, price protection, payment methods (pat/full), licensed materials (format, delivery, updates, interfaces), access method, domain names, network speed and security, archiving options, usages, statistics, untimely the reputation of the information provider. Other general terms and conditions should also be considered as usual.

Promotion Initiatives: This is equally pragmatic since the library alters its service from one domain to other. Basically, it is meant for the users who need access in multiple channels. The library in this perspective requires developing website of its own and highlights the e-book option as one of the components with others in service segment. The other issues relating to the promotions are as follows where the library with the skilled professional must ensure in providing the same. These include (Madhusudhan and Rani, 2013, 86-101),

- Links to the database from library home page to the registered users;
- Channeling information literacy programs for the users both through off-line and on-line   to make the best use of e-resources including e-book, e-journals etc;
- Transmitting information through e-mail, social networking sites such as blogs etc;
- Providing guidelines, on-line tutorials to use the e-resources
- Rendering facilities for downloading the software used by the library while developing e-resources. In this perspective it may be mentioned that the library provides links to   multiple sites to download   e-resources developed by the publishers. Likewise, the   library   while generating e-resources especially for the institutional repositories using   any   open   source software like GSDL, Koha, E-prints, D-Space or any other   software   also   must   provide   the facility to the users for downloading the same for   seamless access to the e-resources.
- Conduct of seminars/workshops in frequent intervals so as to get abreast with the change   in services by the library including on-line interaction with the librarian;
- Feedback   and   inviting   suggestions   through   both   on-line   and   off-line   to   make amendments/modification in the library service.

5. COLLECTION EVALUATION AND ASSESSMENT

In principle, the collection evaluation and assessment are indispensable in spite of all impediments to ascertain the attitude of the readers in changing reading habits, use of the library resources, and adjudicate the crucial reading materials etc. It implies the strength and weakness of the library with regarding to the collection development along with the users' interest in library resources. Further, this is an adjudication process of the library irrespective of its types whether, academic, public or

special which initiate changing policies of the library whether collection development, library services etc. The Washoe Country Library (http://www.washoe.lib.nv.us/) while pointing the issue has categorically stated that, the evaluation not only determines the quality of resources but also ensures that, the library attends to its mission while providing reading materials in a timely manner to the patrons' interests and needs. Further incessant evaluation of the library transforms the collection of resources and its availability to the patrons. This is, however, applicable for both traditional and e-resources. There are multiple ways to determine the issue such as questionnaire, interview, circulation statistics etc. in a traditional way. Electronically, this also can be accessed through the visit of the users through website; number of hits on a document, number of downloads of a file or document including the place from where the user is assessing the site. The process not only strengthens the library with adequate resources but also reveals the weeding out of the documents from the active shelf of the library. The library also needs to promote the use of e-journals, e-book and other e-resources through new arrivals in the website.

Hence, it has become concern for the librarian in the changing and competitive environment to drag the users by providing the new services such as, digital repositories, database, e-book, content management etc. to sustain the value of the library in true sense of the term.

6. WEEDING OUT POLICY

Weeding out is equally important in any library setup. This mechanism ensures for withdrawal of resources from the library which, however, requires keeping in the passive shelf in a traditional environment. With regard to electronic collections, backup devise like, CD-ROM, External Hard disk can be employed for storing of the information so as to be used if situation warrants. The National Knowledge Commission in 2007 has recommended for a continuous process of weeding out of the books except in the case of national repositories (http://knowledgecommission.gov.in/downloads/documents/NKC_Library.pdf). Therefore to act upon this mechanism, each library requires evolving a weeding out policy duly approved by the competent authority. It may be mentioned that, the Washington and Lee University (http://library.wlu.edu/UniversityLibraryWeedingPolicy.pdf) in its weeding out policy the following guidelines.

- Retaining or withdrawal of the old edition of a document is finalized by the authority on availability of new edition;
- The Head of the Technical Service or the authority concerned determines the withdrawal of any serials and replaces with new serials.
- Dilapidated documents are replaced or withdrawn by the authority.

However, with regard to the Government Document Collection Development Policies, the Yale Law School (http://library.law.yale.edu/government-document-policies) has significantly discussed the weeding out of e-resources as follows that,

- Weeding out of the collection, being one of the ongoing process due to space constraints,   the outdated titles both in tangible and e-formats need to be withdrawn;
- While weeding out, the notes are recorded in the bibliographic record for the titles in which the current editions are maintained;
- Microfiche documents are retained for 5 years.

Belinda Boon in 1995 in his book on 'The CREW Method; Expanded Guidelines for Collection Evaluation and Weeding for Small and Medium-Sized Public Libraries (Austin, Texas: The Texas State Library) has discussed about the application of CREW Method in weeding out of documents in the library (http://lili.org/forlibs/ce/able/course4/05criteria.htm). The acronym of CREW stands for Continuous Review, Evaluation and Weeding. According to him, this method can be applied for smaller libraries where research emphases are less. However, basing on the norms and principles, the academic libraries especially in the college and university level may be adopted with other evaluation technique to ascertain the value of resources, retaining and discarding of resources etc. to make the

library resourceful oriented collections.

Weeding out of books not only is confined to the academic libraries but also is applied in the public library system. This could be visualized from Boulder Public Library (http://bcn.boulder.co.us/library/bpl/general/select.html) that stipulated the weeding out policies as discussed below which, however, rests on the decision of the competent authority.

- Materials which are worn, obsolete, damaged or lost;
- Replacement with other format of the item other than the available form;
- Support of the new format should follow with adequate reasons;
- Other networking agencies better facilitate the service.

Hence from the above discussions it could be inferred that, weeding out is imperative for both traditional and electronic in all types of libraries to provide effective services in the electronic environment.

7. ISSUES AND CHALLENGES AMONG THE LIBRARIANS

The varying attitude of the users in information seeking behaviour in the domain of emerging technologies, availability of e-resources in multifarious forms, changing dimensions of collection development from traditional to electronic resources, scientific management of e-resources etc. precipitated to many foremost issues among the librarians especially in the academic and special libraries which require complying dashingly with confidence. The issues pointed by Harish Chandra (2012) as discussed below vividly expose the concern over the management of e-resources. It becomes prerogative of the librarian to get implemented the new technology based services to keep the face value of the library in future even if it is tough.

- Recognition of appropriate source for e-resources;
- Developing adequate infrastructure to support e-resource services;
- Creating trained manpower to manage the e-resources;
- Exploring measures to initiate content management service instead of document management service;
- Facilitating the users as Technology educator by accepting technology commutes and emulations and impart training to the users to optimize the use of library resources;
- Providing qualitative library service in the ICT horizon;
- Convincing the authority for e-collections in the library;
- Motivating the library professionals to join hands in the new venture;
- Orienting the professionals with the technology.
- Generating the new products from the resources using the technology for the users; and
- Marketing the library products and services.

Therefore, the future librarianship is much challenging in view of the above discussions and also is going to witness the profession more challenging as multiple factors as discussed below are associated with the librarianship which affects the profession resulting thereby, obligatorily accommodate and accept the challenges for their survival in new millennium.

- Emergence of digital libraries,
- Information explosion,
- Changing information need of the patrons,
- Need based collection development,
- Multidisciplinary research,
- Shrinking Library Budget,
- Capacity building,
- Professional skilled personnel,
- Assurance of Quality Services,
- Emergence of social networks,

- Availability of abundant e-resources in multiple formats,
- Setting up Institutional of digital repositories,
- Developing skills among the patrons to access the information,
- Allowing the library access on internet etc.

8. CONCLUSION

The availability of electronic resources opened new vistas in collection development in the libraries. Although acquiring materials in digital form and organizing them for use are both costly and challenging because of the infrastructures, licensed software etc., the libraries still give priority for its acquisition to allow the users for its timely, update, convenient and uninterrupted use and wider access. Now it is evident that electronic resources have become critical elements for any academic, special and R&D libraries as they offer significant added-value such as uniqueness of information, ease of use, wider accessibility and cost-effectiveness in long-term. The organization and management of authentic and evaluated e-resources equally plays a predominant role in dissemination of information to the users at the right time. E-resources are indispensable in libraries because of the following reasons such as,

- Instant access of information 24x7x365days;
- Global accessibility of information without any geographical limitations;
- Speedy delivery of information;
- Enhancement of Research and Development.

Thus, it is the time for the libraries to adopt the principles of accumulating e-resources inspite of all hurdles to meet the multifarious requirements of the patrons and support for a sustainable quality teaching and research in the academic arena.

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INFORMATION RESOURCES IN THE MINORITY GOVERNED LIBRARIES IN WEST BENGAL

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1. INTRODUCTION

'Collection development'—the term denotes many things to many people. The plethora of exciting and interesting collections revealed through this term, bring into limelight a host of important hidden treasures in a library. These treasures may have been unearthed till date, or may have been exposed, and often are being explored by the common people, book lovers, bibliomaniacs, philanthropists and the other persons concerned with books. Collection development in a library means above all, fortifying the library with rich treasures, building up step by step the collections therein, thereby making the library a citadel of hitherto unexplored house of knowledge.

2. MINORITY GOVERNED LIBRARIES IN WEST BENGAL : AN OVERVIEW

A special group of public libraries have been mapped out in some districts of West Bengal, and these are exclusively governed by the Minority Communities. The Minority Communities in India form a very important group, and according to the Census of 2001, these are six in numbers. In West Bengal there are six minority groups exclusively. There are Muslims, Christians, Buddhists, Sikhs, Jains and Parsees.

A database of the libraries governed by the minority communities in West Bengal is still lacking. Research into this area has brought into limelight that there are 121 libraries in total, governed by these communities in 13 districts of southern part of West Bengal. These libraries are mostly in deplorable conditions, apart from a few, well funded by some NGOs or private concerns. The characteristic features of these libraries are noteworthy, as these are the houses of some exciting, rare, and very valuable jewels of documents. These libraries are the brainchild of some enthusiastic book lovers, social activists, and local organizations, not to mention others. They have not depended on the Government or on other sources often; and have themselves raised their libraries mainly for the benefit of the societies. Many interesting facts are revealed, if we delve into the depth of these libraries. The oldest of these libraries is the large library and Research centre in Hooghly district. The Muslim minority governed libraries are maximum in number, as revealed in this study. Just on the opposite hand, we find that the libraries governed by the Parsee community are inconspicuous. Though the Sikh communities are very less in number, yet there are some libraries which are governed by these, and people from Sikh communities throng here. Regarding users and use studies, many interesting features come into the limelight. Very less known, yet these libraries often cater to the local communities in a very reasonable and friendly manner. They help them cater their daily want, cherish their recreational needs, and supplement their need of information in one way or the other. In the remote and remotest corners of the villages, in the tinsel towns, the libraries are there, giving special information to the local inhabitants --the barriers of time and distance are overcome by the presence of these locally.

3. COLLECTION OF RESOURCES IN THE MINORITY GOVERNED LIBRARIES

The collections pave their way to understand the need of the community as a whole. District wise, if studied, it is found that Hooghly district has a rich collection, the earliest one being in Carey Library and Research Centre with the oldest book dating as back as 1800. Birbhum district also houses rare scriptures of Buddhist religion, which attracts a lot of people from Buddhist community. The presence of very old books on Muslim religion is another attraction for Furfura Jafria Library, where we find a lot of foreigners coming each year to avail the information. The Zend Avesta, the Holy Book of the Parsees, very rare in type, is found in The Late, Ervad D.B. Mehta's Zoroastrian Anjuman Atash Adarn Parsee Library, which is the only one present in Kolkata. Many of the researchers are unaware of this information.

A large number of books on Islam are the characteristic feature of the libraries of Murshidabad district. This district, though not literally not much advanced, yet has a total collection of 79,179 books in the various 24 libraries, just in the second position after the much literally developed Kolkata. Hooghly has 16 libraries, where the collections amount to a total 74,326 books, and 147 periodicals. The pitiful condition of these types of libraries is found in Bankura, Nadia, Purulia and West Midnapore district, where there are only 2 libraries in each, with the last one housing a single library. It is very sad to note that East Midnapore does not house a single library of this type, and the two libraries which were running before have been closed down at present.

The following tables show the collection of resources in the various libraries of the various districts of West Bengal: The symbol in the parentheses denotes the particular community by which the library in managed-Muslim(M), Christian(C), Buddhist (B), Jain (J), Sikhs(s) and Parsees(P).

Table 1: Bankura District

Sl. No.	Name of the Library	Total Books	Periodicals	Maps	Rare & Historical Books	Special Collection	Oldest Acquisition
1	Punisol Ajimia Gramin Grahnthagar (M)	4325	03	05	--	--	1979
2.	Giridharipur Mujaffar Ahamed Gramin Pathagar (M)	3733	06	03	--	--	1960
		8058	09	08			

This district is not much developed socioeconomically, is revealed by the fact that there are only two libraries run by the minorities in this district. This picture is rather gloomy compared to the other districts.

Table 2: Bardhaman District

Sl. No.	Name of the Library	Total Books	Periodicals	Maps	Rare & Historical Books	Special Collection	Oldest Acquisition
1	Abdul Bari Competitive Library (M)	300	13	01	--	--	1980
2	Allama Iqbal Library (M)	1175	05	--	--	--	--
3	Allama Iqbal Reading Room (M)	700	05	03	--	--	--

4	Allama Iqbal Urdu Library (M)	2255	19	--	--	--	1966
5	Economical Social Industrial Institution Library (C)	3500	03	06	110	--	--
6	Kahkashan Club and Library (M)	257	03	02	--	--	--
7	Maulana Abul Kalam Azad Urdu Library (M)	2500	04	02	--	--	--
8	Maulana Md. Ali Jauhar Urdu Library (M)	2000	63	03	--	--	--
9	Shantigriha Library Diocese of Durgapur (C)	623	04	--	--	--	--
10	Sir Syed Mission Competitive Library (M)	1000	03	04	--	--	--
		14310	122	21	110		

Most of the libraries in this district are run by the Muslim community, and not many rare and historical books are found in the libraries of this district.

Table 3: Birbhum District

Sl. No.	Name of the Library	Total Books	Periodicals	Maps	Rare & Historical Books	Special Collection	Oldest Acquisition
1	Abdul Halim Smriti Pathagar (M)	3800	06	02	--	--	--
2	Atish Dipankar Library (B)	2000	--	03	120	--	2000
3	Dokhalbati Rural Library (M)	3951	04	--	--	--	1980
4	Dholtikuri Rural Library (M)	3840	04	04	05	--	1980
5	Gopalchak Janakalyan Samity Rural Library (M)	5200	01	--	--	--	1972
6	Kaitha Y.M.A. Rural Library (M)	5587	05	01	--	--	--
7	Margram Bandhab Samity Library (M)	3855	03	--	--	--	1980
8	Rasulpur Gramin Granthagar (M)	4763	04	01	--	--	1981
9	Samsuzzoha Zakia Public Library (M)	6029	08	03	03	--	1938
10	Ujirpur Sobuj Mahal Pathagar (M)	3119	02	--	--	--	1981
	Total	42144			--		

A Buddhist run library is the characteristic feature here. The libraries are comparatively new, which is depicted mainly by the age of the resources.

Table 4: Hooghly District

Sl. No.	Name of the Library	Total Books	Periodicals	Maps	Rare & Historical Books	Special Collection	Oldest Acquisition
1	Allama Ibne Taimiyah Central Library (M)	10000	10	01	01	--	1965
2	Al-Mustafa Library (M)	290	02	01	02	--	2011
3	Amgram Mahasin Pathagar (M)	3000	04	03	--	02	--
4	Arambag Millatul Islam Library (M)	200	03	02	--	--	2003
5	Carey Library and Research Centre (C)	12000	02	03	04	03	1800
6	Dr. Ambedkar Library (B)	1000	02	01	03	--	--
7	Furfura Jafria Library	3800	05	10	120	03	--
8	Furfura Youngmen's Public Library (M)	1706	--	--	--	--	--
9	Hanifia Dini Library (M)	400	02	02	01	--	1970
10	Islahul Muslemin Library (M)	3000	02	02	01	--	--
11	Konnagar Hanafi Library (M)	4800	--	--	--	--	--
12	Mojaddeya library (M)	550	--	--	--	--	--
13	Rautara Islamic Library (M)	360	02	01	--	--	1980
14	Suratsingpur Islamia Pathagar (M)	700	--	--	--	--	--
15	Telenipara Hamdard Linbrary (M)	2520	03	--	--	--	--
16	Theology Library (C)	30000	110	--	02	--	1818
		74326	147	26	134	8	

A very significant feature of the libraries of this libraries of this district that this library has a rich collection, the earliest one being Carey Library and Research Centre, with the oldest book dating back as 1800, and also the Theology Library has a book as old as 1818.

Table 5: Howrah District

Sl. No.	Name of the Library	Total Books	Periodicals	Maps	Rare & Historical Books	Special Collection	Oldest Acquisition
1	Ananda Mitra Memorial Library (B)	2000	--	--	01	01	--
2	Anjuman Sitria-E-Islam Library (M)	200	02	--	--	--	--
3	Gusuri Azad Hind Library (M)	1500	05	--	--	--	1966

4	Howrah Urdu Hindi Library (M)	2073	02	01	--	--	2008
5	India Muslim Library	500	03	--	--	--	1963
6	Mushtaque Ahmed educational Foundation (M)	200	03	--	--	--	--
7	Sibpur Anjuman Library (M)	5000	04	--	50	--	--
8	Sir Syed Social Welfare Organisation (M)	200	02	--	--	--	--
9	Tathagata Library (B)	250	--	--	10	--	--
		11923	21	01	61	01	

Howrah district houses some very famous libraries. Though collection strength varies, yet some famous libraries house rich collection, e.g. Shibpur Anjuman Library.

Table 6: Kolkata District

Sl. No.	Name of the Library	Total Books	Periodicals	Maps	Rare & Historical Books	Special Collection	Oldest Acquisition
1	Arabindha Barua Library (B)	10000	12	02	02	02	--
2	Belgachia Muslim Library (M)	3853	01	--	02	--	1930
3	Bidarshan Siksha Kendra (B)	4000	300	02	01	01	--
4	Central Urdu Library of West Bengal Urdu Academy (M)	45000	10	03	02	03	--
5	Dharmadhar Grantha Prakasani (B)	4000	15	--	03	03	--
6	Dilkusha Library (M)	10000	35	--	02	--	--
7	Gariya Boudha Sanskriti Samsad Library (B)	3000	02	--	02	--	--
8	Gulab Kumari Library (J)	4000	10	--	100	08	--
9	Gunalamkar Library (B)	2100	05	--	02	02	--
10	Gurmat Library (S)	2000	06	--	02	--	1920
11	Hazi Abdulla Library (M)	2000	05	--	03	02	1882
12	Hanifa Public Urdu Primary Library (M)	4614	15	05	02	03	--
13	Hindustani Library (M)	14000	--	--	--	--	--
14	Iran Society (M)	15000	08	07	12000	18	--
15	Islamia Library (M)	5000	05	--	05	04	--

16	Islamia Library (M)	2600	06	--	02	--	1925
17	Jain Bhaban (J)	10000	03	--	3000	05	1950
18	Mashraqui Calcutta Library (M)	3005	04	02	--	--	1974
19	Maulana Azad Educational Library (M)	5083	88	03	10	05	--
20	Mohammed Ali Library (M)	16500	26	05	500	1900	1930
21	Mohabir Pustakalaya (J)	800	07	--	--	--	1959
22	Motijheel Public Urdu Library	3113	16	02	--	--	1980
23	Moulana Haali Academy (M)	4300	18	01	01	--	1978
24	Qaumi Library (M)	1600	03	02	--	--	1930
25	Sir Syed Library (M)	2188	05	--	50	--	1987
26	Syed Ameer Ali Library (M)	6222	39	08	05	--	1929
27	Tanti Bagh Educational Library (M)	3327	25	--	23	03	1962
28	The Late Ervad D.B. Metha's Zoroastrian Anjuman Atash Adaran (P)	231	03	02	02	02	--
29	The Muslim Institute Library (M)	12000	65	05	105	--	1932
30	The Sikh Cultural Library (S)	1000	15	--	05	04	--
31	The Tiljala library (M)	4611	18	01	90	--	1932
32	The Young Movement Society (M)	1300	02	--	--	--	2001
33	United Friends Library (M)	3216	25	--	--	--	1975
		209663	797	50	15921	1965	

This district has a high collection level of information resources with a total 209663 books, 797 periodicals, 50 maps, 15921 rare and historical books and 1965 special collections, The number of libraries is maximum -33 in this district only.

Table 7: Murshidabad District

Sl. No.	Name of the Library	Total Books	Periodicals	Maps	Rare & Historical Books	Special Collection	Oldest Acquisition
1	Achhra S.S. Athletic Club and Library (M)	2850	04	02	02	--	--
2	Anjuman Hemayetul Islam Granthalaya (M)	605	--	--	--	--	--

3	Benadaha Siraj Smrity Pathagar	3637	03	--	--	--	1970
4	Bhandara Polli Unnayan Yuth Sangha Pathagar (M)	3956	509	04	--	--	1968
5	Bilaspur Janakalyan Pathagar (M)	3835	--	06	--	--	1972
6	D.F.D.Pallimangal Club and Pathagar (M)	5036	10	--	--	--	--
7	Gangadhari Mission Library (M)	1400	17	02	--	--	--
8	Hasanpur Milani Pathagar (M)	5534	568	04	--	--	1953
9	Ismail Smriti Pathagar (M)	3020	02	--	--	--	--
10	Jibanti Rural Welfare Mission (M)	325	04	01	--	--	--
11	Jain Library (J)	7000	03	02	02	02	--
12	Jyoti Public Library (M)	500	03	02	--	--	--
13	Kazisaha Nazrul Library (M)	3500	02	02	01	--	--
14	Laxminarayanpur Sadhana Club Pathagar (M)	3498	490	--	--	--	1963
15	Pamaipur Janakalyan Samity Rural Library (M)	3700	250	08	--	--	1975
16	Ramnagar D.N. Club Rural Library (M)	3236	02	02	--	--	1972
17	Sahajadpur Milan Sangha Rural Library (M)	3043	02	02	--	--	--
18	Samaj Unnayan Samity Rural Library (M)	4623	12	03	--	--	1960
19	Sekhpara Pragati Club Gramin Granthagar (M)	3965	05	--	--	--	1962
20	Sekherpara Nowjowan Club Rural Library (M)	3384	04	02	03	--	--
21	Shibpur Pally Unnayan Samity Rural Library (M)	2364	03	--	--	--	1950
22	Subarnamrigi Mitali Sangha Rural Library (M)	2500	09	--	--	--	--
23	Tarun Sangha Rural Library (M)	4379	05	02	02	--	--
24	Trimohini Progressive	3289	01	--	--	--	--

	Union Gramin Pathagar (M)						
		79179	1908	44	10	02	

It is very interesting to note that though Murshidabad district is socioeconomically not so strong, yet the rich cultural heritage is very well depicted through the 24 libraries flourishing here. These libraries are mainly run by Muslim communities, and they house a good number of information resources.

Table 8: Nadia District

Sl. No.	Name of the Library	Total Books	Periodicals	Maps	Rare & Historical Books	Special Collection	Oldest Acquisition
1	Barkat Ullaha Pathagar (M)	5000	02	03	10	--	--
2	Prerona Library (C)	2000	12	03	07	--	--
		7000	14	06	17		

Nadia district has only two minority governed libraries, but both of these have rare and historical books, as well as periodicals and maps.

Table 9: North 24 Paraganas District

Sl. No.	Name of the Library	Total Books	Periodicals	Maps	Rare & Historical Books	Special Collection	Oldest Acquisition
1	Alambazar Urdu Library (M)	3000	15	--	--	--	--
2	Islami Library and Free Reading Room (M)	3000	07	04	--	--	--
3	Jagatdal Educational and Cultural Society (M)	300	10	--	--	--	--
4	Kamarhati Academic Library (M)	5000	05	--	--	--	--
5	Kamarhati Students Academic Library (M)	800	--	--	--	--	2000
6	Students Library (M)	9675	06	--	200	--	1920
7	Tathagata Bihar Library (B)	3000	02	03	--	--	--
		24775					

This district is quite large in area, but the ratio of the number of these libraries to the area of the district is not worth mentioning. There ought to be much larger number of libraries in this district.

Table 10: Purulia District

Sl. No.	Name of the Library	Total Books	Periodicals	Maps	Rare & Historical Books	Special Collection	Oldest Acquisition
1	Gosner Evengalical Lutharian Church Library (C)	300	--	--	--	--	--
2	Muslim Library (M)	3000	04	--	--	--	--
		3300					

Purulia district is an economically backward district and therefore the very insignificant number of libraries here counts for this reason.

Table 11: South 24 Paraganas District

Sl. No.	Name of the Library	Total Books	Periodicals	Maps	Rare & Historical Books	Special Collection	Oldest Acquisition
1	Battala Muslem Library (M)	11500	03	02	02	03	--
2	Dhola Tarun Sangha Pathagar (M)	2773	12	--	--	--	--
3	Dr. Goffaruddin smriti Sadharan Pathagar(M)	4362	01	--	--	--	--
4	Reverend Krishna Mohan Bandhapadhy Smriti Sadhan Pathagar (M)	4100	04	--	--	--	--
		22735					

All four libraries here are run by the Muslim communities, and the four libraries contain quite a good number of books as well as periodicals.

Table 12: West Midnapore District

Sl. No.	Name of the Library	Total Books	Periodicals	Maps	Rare & Historical Books	Special Collection	Oldest Acquisition
1	Tamralipta Pathagar (B)	2000	04	07	--	--	--

It is very heartening to note that West Midnapore district houses only one Minority governed library, and that is run by the Buddhist community. The gloomy picture of this district does not match with the scenario of the other districts of West Bengal.

4. DISCUSSION

It is revealed from the above tables that 12 districts of South Bengal have the maximum number of 119 Minority community libraries. Kolkata and Murshidabad top this list with 33 and 24 respectively. Muslim governed libraries are 97, Buddhist governed libraries are 11, Christian governed libraries are 06, Jain governed libraries are 04, Sikh governed libraries are 02 and Parsee governed libraries is 1. West Midnapore, Purulia and Bankura districts present a gloomy picture, with the number of libraries

not up to the mark, as compared with the area of these libraries. Comparatively, Kolkata and Murshidabad are in a better position, with a rich repository, and housing ancient and rare collection. Since the cultural status of a district is very much dependent on the libraries, i.e. the users, their reading habits, the type of collection the library houses, therefore it is the need of the hour to establish sufficient number of libraries, so that the people of the district may be benefitted, and may inculcate a reading habit, and be literally and culturally enriched.

5. CONCLUSION

The step by step building up the collection, keeping in background the characters of the information seeking community, consisting of both the proactive and passive users, the actual and potential users is a huge and difficult task. A local community may consist of members from all the groups of minority communities, and selection of books in these libraries, which are in fact, public libraries, poses a real problem. It is to be kept in mind that the members of all the community groups are to be relinquished with their information, and all documents pertaining to their information need are to be met with. So the Trustee Board, Wakf Board, or the Governing Bodies have an uphill task to perform. In this connection, whole hearted cooperation from all sectors of government, NGOs, Philanthropic Organisation, Societies are needed, and proper advice from appropriate human source is also sought for a step by step, properly planned, scientific approach to collection development.

6. ACKNOWLEDGEMENT

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COLLECTION DEVELOPMENT PRINCIPLES AND EVALUATION

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1. INTRODUCTION

The selection policies and procurement of collection form the content of the collection development process. The collection development is a dynamic and continuum activity of every library. In this process of collection development; the user community, library staff and the subject experts, are the main components for selection of documents for the library. In an academic library, the user community may be students, teachers, researchers and administrators etc. Among the students there may be undergraduates, post- graduates and Research Scholars. Since the academic library has to support the teaching, training research and extension programmes of its parent organization. And the standard collections and services are; meant to meet the curricular, co-curricular and extra-curricular and research needs of its clientele. The library collections i.e. text books reference books, periodicals and other materials are extensively used by the students, scholars and teachers, and the extensive use of background materials will balance the development and management of the library collections, and to satisfy the user needs. The collection development involves selection tools for books; like bibliographies; catalogues; book sellers' catalogue and National Bibliographies & Subject Bibliographies etc., now the online book shops bibliographies, catalogues and trade catalogues will help to grow the standard collections in the library without any delay.

2. OBJECTIVES OF THE STUDY

- Whether Library Professionals have any Knowledge about the principles and practices of Collection Development;
- To evaluate the importance of these Collection Development principles and its application in the Libraries

3. METHODOLOGY

The present study reviewed the related literature on the collection development parameters to find out the various practices and principles of collection development this study is based on the principles and parameters of collection development, propounded by the experts in Library Science Subject. To give insight into this subject area to improve and implement the collection development strategies in the libraries. The conceptual presentations on the basis of the expressed views of the experts, the researcher made an attempt to draw the importance of the implementation of collection development polces and principles in the Libraries.

4. ANALYSIS OF THE STUDY

Steps in Collection Development:
- Information needs of the users,
- Type and Nature of the library,
- Acquisition Programmes to build- up a Collection Development
- Impact of Resource sharing
- Collection Evaluation.

- Stock verification of weeding out porgrammes will help effectiveness of collection development

Collection Development Principles: Collection development is based on library committee and every library must be based on some principles for document selection. The well established Six Collection Development Principles are as follows:
- Drury's principles
- Dewey's principles
- McColvns demand theory:
- Five law's of Dr. S.R. Ranganathan
- Haines principles
- Grorge S.Boon's questions

Drury's Principle: Duruy in 1930 enunciates "To provide right book to the right reader at the right time". In his opinion, the reader is the centre point in selection of a document based on these principles, i.e. the selection of documents based on user's requirement to meet the user needs and demand.

Dewey's Principle: Melville Dewey believe that "The best reading materials for the largest Number of users at the least cost". According to this principle, large number of readers within the financial resources the library provides information/ documents to large number of users to meet the user satisfaction. Our selection of documents should be within the limitation of financial sources, and more number of the readers must be satisfied.

Mc Clovens Demand Theory: In 1925 he propounded "Demand and Supply Theory" this is more close to book selection, related to demand, the greater is the resultant of possible service. The term supply attributes availability of the reading material. Demand is exhibited the needs of the users. This theory advocates the selection of only those documents which are demanded by the users according to their information needs.

Five Law's of Library Science: According to Ranganthan's Five Laws are helpful in the selection of documents. First Law, Second Law and Third Law help in book selection. First Law emphasis users; Second Law stressed on the Books, and the Third law recommended on reader's point of view. The first two laws are supporting in mind, selection of document and collection development which will help in providing the right book to right user at right time.

Haines' Principle: Haines designed two principles for document selection; he developed balanced and unbiased principles
- Each library should be built up according to a definite plan on a broad general foundation. Its development must be flexible, but constant attention must be paid to the maintaining of just proportions as a whole, so that certain classes will not be over emphasized and others may be neglected. The needs of the library exist and should be met, as well as the need of the reader.
- The second principle the selection of documents be positive not negative.
- The other principles of Haines, be positive not negative policy; Gorge Boon's principles are most suitable for the users and are described as follows.

Grorge S. Boon's Questions: Boon suggests the following questions which should be answered before arriving at a decision to select a document:
- What books or periodicals are being published,
- Of all these which ones are in fact obtainable,
- Of all those that are obtainable which one are really worthwhile,
- Among those that are worthwhile, which ones are most suitable for the kind of library or the kind of user community under, consideration,
- Among the most suitable ones, which are definitely best for the needs of the particular library or the particular reader involved,

- Then the best obtainable for the library, which can that library actually afford to buy,

The published document which are still available and is worthwhile for the library and its most suitable for the user. Even these selected documents can only be procured and made available to the user community if the library can afford to buy it. The selection as such is also regulated by the resources available.

5. OBSERVATIONS OF THE STUDY

The researcher observed the essences of various principals' are meant for document selection, and the documents will meet the information needs of the user community, with the provision of best reading materials in the library. The five law's of Library Science i.e. Documents are for use and every user his document; these laws will encourage to select and promote the use of those documents which are not in demand presently but are likely to be on demand in future because of their inherent value. The selection of such documents would make the collection rich, as well as useful for the coming generations.

Further the readers felt that the McColvin's demand theory is not considered as a sound basis for document selection and it is believed that the library can never expect to have a well-balanced collection; if the demand theory is strictly followed. Because it stand as one of the basis to express and create demand from the user. Communities Along with demand, the other relevant factors are also to be considered. The great works of literature and the books are of permanent value and lasting influence, i.e. the classics, etc., are also to be selected whether the demand exists or not. Otherwise instead of developing a worthwhile collection as the best reading materials, a worthless collection may be result due to change of user demand and choice. Hence some flexibility is thus needed in selecting what are the required items and which are not demanded. As far as possible all reasonable demands of the users should be met and the efforts should also be made to serve and satisfy as many users as possible within the resources available.

6. EVALUATION OF COLLECTION DEVELOPMENT

There are a number of approaches to evaluate the collection development practices. The present study made an attempt to present few standards and practices for evaluation of the collection development

- One or more individuals or some type of listed documents
- Evaluation against a standard list

A less subjective external standard is the list of documents prepared by some authoritative organizations and several types of list of books or periodicals recommendation for libraries of recommended titles have been prepared for this purpose.

Ranked Lists: A particularly, a useful kind of list is one; that is ranked to reflect some order of priority or importance. Ranking can be done on the basis of the items asked for by the users of libraries or items most cited by writers in the field.

Creating One's Own List: Of course standard list will not exist for all forms of collection evaluation. It is always possible, however, to create one's own list. Such a list can be compiled by taking a representative sample of books or articles recently written on a particular subject and using the sources cited in the works as a test set to assess the adequacy of a document collection in this subject field.

Use Studies: A study of the use actually made of a document collection can also be undertaken. Many studies of this kind have been carried out in the different libraries on book collections of academic libraries. The major purpose of such studies are the identification of the proportion of collection that are most used and those that are least used, so that the most used portions may be stored in the most accessible locations and the less used portions are stored at less accessible and less expensive storage

areas. There are basically two possible approaches to the conduct of a use study of this type: i.e. 1) use of collection sample and 2) use of circulation sample.

7. CONCLUSION

The application of the selection principles are not an easy task. The nature of the library, the standard and taste of the users depends on the availability of documents in the subject or language or form desired by the users. The resources, existing collection, the extent of resource sharing practiced, by the organization etc. have their own role to play in document selection. The functions of the library should determine the character of the book collection. The document should be selected in view of the use interests, and for enlightenment of all the people. The application of selection of principles should result into a need-based, balanced and up-to-date collection which is useful not only for the present but also for the posterity. The selection documents of all types are for building –up; effective library collection, for which some established principles of documents selection are to be followed. Those enunciated by Duruy, Dewey, McColvin provide due guidance and are quite helpful followed by S.R. Rangnahan's Five Laws of Library Science.

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DIGITAL COLLECTION MANAGEMENT : AN EMERGING ISSUE

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1. INTRODUCTION

In this 21st century, people are tremendously moving towards digital environment whether in case of library professionals or stockholders such as entrepreneurs, industries, exporters, policy making bodies, scholarly communities, Government etc. This dominating digital era make the life easy to make them more informatics in one hand, whereas on the other hand it is challenges to manage digital documents. In case of libraries, due to influx of various types of digital collections, it is an important issue both for library professional as well as content providers for managing the digital resources. This is because when both were found that Integrated Library Management Software (ILM) and Digital Libraries Software are not adequate to manage digital resources. In this paper, authors made an attempt to describe the type of digital collection, tools and technology to manage digital collection, challenges in managing digital collection and future direction on digital collection management.

2. TYPES OF DIGITAL COLLECTION

A digital collection comprises of digital materials that are selected, procured, organized, managed and stored to facilitate their discovery, retrieval, access, and use. The various types of digital collections are described below:

E-databases: An E-database is a structured collection of data about a particular area or multi-disciplinary subject areas. The data of an e-database can be searched and retrieved electronically. These are distributed online as well as through CDROM. It provides flexible and thorough searching on different access points such as journal title, article title, author, abstract, year, industry information, company data, statistical data etc. An e-database contains journal articles, newspaper articles, book reviews and conference proceedings, data about industry, company, statistical data etc. The following are different types of e-databases:

CD ROM Databases: CDROM stands for 'Compact Disc-Read-Only Memory'. This is a type of optical disk having the capacity to store large amounts of data. Databases stored on CD-ROM are known as CD-ROM databases. The users search their queries through different search features. Some of the popular CD ROM Databases are: AGRIS, CAB Abstracts, ULRICH'S Periodicals Directory, Social Sciences Index, LISA, Indian Standards, Science Citation Index, Indian Science Abstracts, etc.

Online Databases: An online database is a database which is accessible from a local area network as well as from the Internet. These are normally delivered via a web browser and are subscribed on an annual basis. EBSCO databases, Capitaline, CRISIL Research, Indiastat are example of online databases.

Bibliographic Databases: A bibliographic database comprises of bibliographic records. These are structured digital compilation of references to books, journal and newspaper articles, reports, conference proceedings, government and legal publications, standards, patents etc. It contains subject descriptions in the form of keywords, subject classification terms, abstracts, etc. A bibliographic

database contains bibliographic information about various types of publications and formats (print, video, audio, software, etc.). Books in Print, Chemical Abstracts Service, Library and Information Science Abstracts, MEDLINE are some of the bibliographic databases.

Full Text Databases: A full text database includes the complete text of books, periodicals, dissertations, journals, newspapers etc. These documents are available for online viewing, printing, and downloading. In the full text databases apart from text documents, images in the form of graphs, maps, photos, and diagrams are often included. A full-text database is searchable by keyword, phrase, author, publisher, etc. JSTOR, ProQuest Dissertations and Theses, Econlit with full text; Wiley Online Library, eBrary, etc are example of full text databases.

Citation Databases: Citation databases are databases of bibliographic information about publications such as scholarly journals, conference proceedings and books. Citation databases also store the references (citations) that authors include in the reference list of their publication and so can be used to search for publications that cite a known author or work. The most widely used multidisciplinary citation databases are Web of Science and Scopus.

E-journals: E-journals are also known as electronic journals, e-journals, online journals and electronic serials. These are scholarly journals available in full text in electronic form. Electronic journals are accessed via electronic transmission, usually published on the web. Some e-journals are online-only, whereas others are online versions of printed journals. Most e-journals are published in HTML and/or PDF formats, but some are available in only one of the two formats. Though most commercial e-journals are subscription-based, an increasing number of e-journals are also available as open access journals, requiring no subscription and offering free full-text articles to all. Directory of Open Access Journals (DOAJ) is an online directory which provides access to open access journals. EBSCO's Business Source Complete, ProQuest's ABI/INFORMS Complete and JSTOR are aggregators of e-journals.

E-books: Electronic books are generally known as e-books. An e-book is the electronic version of a printed book which covers the full contents of the book such as text, tables, diagrams, illustrations, etc. An e-book collection is usually set up in an e-database, which supports full-text searching within and across titles, advanced search and bookmark functions. Users can view full text of e-books in HTML or PDF format online. Ebrary and Net Library are examples of e-book databases.

E-Reference Sources: The various e-reference sources are as follows:
Theses and dissertations: Electronic Theses and Dissertations (ETDs) are theses or dissertations prepared as text-based PDF files. ETDs can contain non-text elements such as multimedia, sound, video, and hypertext links. NDLTD is an international organization dedicated to promoting the adoption, creation, use, dissemination, and preservation of electronic theses and dissertations (ETDs). ProQuest Dissertations and Theses is a commercial database.

Encyclopedias and Handbooks: Various publishers are digitizing the encyclopedias and handbooks into electronic form. Encyclopedia Britannica has brought the online edition. Sage publications and Oxford University Press has published the electronic version of encyclopedias and handbooks.

Newspapers: Most of the newspapers are now available online and are known as e-paper. Newspaper Direct (Press Display) is a database which contains the full content of newspapers and magazines from various countries. LexisNexis Academic Universe also provides access to newspapers.

Emerging Types of E-Resources: Following are the emerging types of e-resources which offer innovative approaches to information handling and have considerable potential for libraries too. These are:

BLOGS: A blog is a discussion or informational site published on the World Wide Web and comprises of posts which are displayed in reverse chronological order (the most recent post appears

first). Most of the blogs are interactive. They allow visitors to give comments. Blogging can be seen as a form of social networking service. Blogs function as more personal online diaries.

WIKIS: A wiki is a web application allowing people to add, modify and delete content in association with others. Wikis are a useful tool for facilitating online education, or for the creation and delivery of user-generated documentation.

RSS FEEDS: RSS is known as Rich Site Summary or Really Simple Syndication. It uses a web feed to publish frequently updated information: blog entries, news headlines, audio, and video. Library can use RSS feeds as an easy means of publicizing activities and library news. An RSS document called as feed or web feed includes full or summarized text, and metadata. RSS can be used to disseminate news, events or summary information on a particular topic. RSS feeds enable publishers to syndicate data automatically. A standard XML file format ensures compatibility with many different machines/programs. RSS feeds also benefit users who want to receive timely updates from favorite websites or to aggregate data from many sites.

3. TOOLS & TECHNOLOGIES TO MANAGE DIGITAL COLLECTION

The various tools and technology are described below:

Institutional Repository (IR): An Institutional Repository (IR) is a digital archive where an academic institutions' intellectual work is preserved and made accessible. The scholarly materials published by the faculty members and research staff are made accessible and available to users through web-based searchable databases through intranet and internet as well. IR includes student's thesis and project reports; faculty's publications, lecture notes and presentation etc. The popular software to manage IR is: DSpace, Greenstone and e-Prints.

Access Management/Authentication: Once e-resources are procured access has to be given to the user's community. There are various methods that can be used for both authentication and authorization of licensed e-resources. These are:

Username and Password-Based Access: User name and password are the most common mechanism for giving access to the users. The users can access to the subscribed content of the library by using the login credential provided the e-resources providers from anywhere. The method for accessing e-resources via UserID / Password has less security as it is not easy to keep the password secret for long period.

IP (Internet Protocol) Based Authentication: To overcome the misuse or security issues with user id and password system of accessing the e-resources, IP authenticated access method become more popular and commonly used in the library. The benefit of this method is the user need not to remember/worry about the User ID and Password. In this mechanism library provides a range of IP address to the content provider. IP based access authentication has a suitable and an appropriate function for access e-resources for the on-campus, but the e-resources can't be accessed from off campus.

Remote Access: Remote access mechanism is required if the users want to access the e-resources outside the designated IP range. The user's first need to login to a proxy server. A proxy server allows users with log-in credentials to log in to the proxy server. The campus network allows remote access to authorized users by passing them through a proxy server. EZproxy is a remote authentication system that helps users with remote access to Web-based licensed content subscribed by the libraries. It authenticates library users against local authentication systems and provides remote access to licensed content based on the user's authorization.

A to Z Service: It provides access to e-resources with an A to Z list through library portal which

contain links to all e-resources. It allows the users to find the e-resources easily. It provides access to all of library's resources, including e-journals, titles in full-text databases, titles in publisher packages and e-books.

Federated Search: Library subscribes to several e-resources. It is very time consuming if the users search all the resources separately. In the federated search facility, instead of searching the e-resource one by one in different platform, it allows users to real-time search of multiple e-resources simultaneously at a time through single search query wherein users can get the result in a single integrated list. The popular federated search services are: 360 search from Serials Solutions, MetaLib from Ex Libris, and EBSCOhost Integrated Search from EBSCO.

Discovery Service: Discovery service pre-indexes the metadata and also the full text documents, where as federated search applications do search live sources. Hence discovery search is much faster than the federated search. Discovery service provides a single search interface to multiple resources. Discovery service facilitates the users to search multiple full-text and bibliographic databases subscribed by the library as well as open access e-resources, library OPAC, and IRs through a single search box. The most used discovery services are EBSCO's Discovery Service, ProQuest's Summon, Ex. Libris's Primo Central.

Link Resolver: It allows users to find out the availability of scholarly full text information resources such as e-books, e-journals, e-theses etc that the library have and redirects the users to those resources. It is a service that redirects users from an online link to the subscribed content that the user can access.

Challenges in Managing Digital Collections: There is a tremendous increase of digital collections in the library. It is found that the whole process of managing these collections such as acquisition, access control, administration, support system, and evaluation monitor are very difficult to manage with the existing Integrated Library Management Systems (ILMS). Therefore, it is a great task both for librarians and content providers to address this issue. A study made by Jewell in 2001 stated that many libraries had started in developing local software to beat these pitfalls. The workshop held in May 2002 in Chicago co-sponsored by NISO (National Information Standards Organization) and DLF discussed on standards related issues of Electronic Resource Management System (ERMS). This caused to formation of the DLF's Electronic Resource Management Initiative (ERMI) in October 2002 and published a report knows as ERMI Report in August 2004 (Jewell, 2004).

The report asserted the need for "comprehensive ERMs", and follow a review of several locally-developed ERMS, identified the following set of goals for the initiative:
- Design and develop universal tools and specifications to manage the license agreements, internal administrative processes which are associated with the licensed electronic resources;
- Depict architectures required for the e-resource management;
- Promote the development of systems.

Emerging thoughts on new dynamics of Digital Collection Management: As digital collections dominated into a today's modern libraries collections, a new kind of software called the electronic resource management system (ERMS) emerged. The ERMS software is developed to manage all the issues such as acquisition, access control, administration, support system, evaluation monitor, licensing etc. It is a one-stop solution for 'managing' and 'accessing' of digital collection both for librarians and end-users.

Several companies/vendors/institutions have developed ERM products. Some of the commercial, open-source and locally developed products are mentioned as follows:

Commercial Products:
- ERM, SwetsWise, Swets Information Services B.V

- ERM, Innovation Interfaces, Inc.
- ERMS - SirsiDynix, Serial Solutions
- Meridian, Endeavor (now owned by Ex Libris)
- Verde, Ex Libris
- EASY, Square Information Systems
- Gold Rush, Colorado Alliance of Research Libraries
- True Serials, Nylink

Open-source Products:
- CUFTS, Simon Fraser University
- ERMes, University of Wisconsin-La Crosse
- FreERMS, by Touro College
- HERMES (Hopkins Electronic Resources Management System), Johns Hopkins University
- SMDB, SemperTool

Locally Develop Product:
- VERA, MIT
- Harvard ERM, Harvard University
- ERMdb, Boston College

4. CONCLUSION

Proper management of digital collection is an important function of any academic library. In conclusion, this paper would be a capsule for the library professionals who are generically facing in managing their digital collection. Types of digital collections, tools, technologies and ERMS mentioned in this paper for managing digital collection would be a great help in understanding this new concept which is an emerging issues in this digital environment.

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DESELECTION : AN INDESPENSIBLE TOOL FOR ENGINEERING COLLEGE LIBRARIES

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"...Deselection out requires more knowledge, forethought and power of discrimination than is ordinarily brought to bear in the selection of books."

✍ **Thomas Aldred, Book Selection and Rejection (March 1901)**

1. INTRODUCTION

Library work is an intricate mixture of programs, services, and materials. It is important to recognize that Deselection is one integral of the collection development process, which has been overlooked in most of the cases. The library's collection is the most important part of any library's service. The library collection should be continually evaluated keeping in view the institutional requirements for the purpose of both adding new titles and identifying for withdrawal those titles which have completed their life cycle. No title should be retained for which a clear purpose is not indicated in terms of academic or non academic programs.

Collection development is considered as the process of adding new materials to the library to benefit the member community. Deselection (or de-selection) of materials in the collection is another component of collection development process and serves to maximize the utility of the library collection.; Deselecting the collection provides space for newer materials and increases the worth of the collection by removing outdated/unwanted material or items in pitiable condition.

Deselection is fast becoming an integral part for libraries everywhere. Engineering College Libraries are no exception. Deselection is one of the important tasks in managing diverse library collections. The process is a common routine practice in developed countries irrespective of the type of the library, public, special or academic. The studies have disclosed that Deselection practice in libraries are with several problems and need urgent attention. This issue has to be addressed at national level to build up a national de-selection framework with space to address individual as well as institutional requirements. The practice of Deselection provides shelf space for new arrivals - and the users are facilitated for easy access to the required material in the library, thus avoiding confusions. Deselection or de-acquisition comes under collection development policy of any institute. A well documented Deselection out policy is a must for an Engineering College library to maintain its collection at its best level. The practice of Deselection is a time consuming and laborious activity which needs expertise in every single item Deselected, since the judgment itself sometimes becomes controversial. Deselection is a must at any library, and when it comes to the higher level, it is more important as the library users there are always in need of accurate and up-to-date information. Systematic evaluation and Deselection is always necessary in order to keep the collection receptive to customers' needs, to insure the collection's life and usefulness to the community, and to make space for new materials. Deselection is selection process in reverse.

2. REVIEW

According to Kay Mahoney, small library collections should address the use of circulation statistics

when Deselection. She suggests the time frame of three to five years without circulation as an indicator for Deselection (1982). Additionally, Mahoney discusses the importance of removing books that have become out-dated. In their criteria for Deselection, the Education Media Team of the Calgary Board of Education gives five years as the shelf life of career materials; this is due to "qualification discrepancies in materials dealing with career preparation" (1984). Expert opinion, while a highly regarded component of a librarian's skill set, can often be found outside of the library staff. Richard Hulser writes that subject specialists can provide input on the Deselection of materials that are "strong candidates for Deselection" (1986).

The practice of discarding or transferring (to storage) superfluous copies and rarely used books and material no longer of use is called Deselection (Parmar and Bhuta 1992). Deselection which is also called deselecting, de-acquisition or book withdrawal is one of the most important tasks in collection management. In a well organized library, Deselection is a compulsory routine to which the librarian pays greater attention and should have the expertise to fulfill the requirement. When a library is not paying much attention to Deselection, its collection becomes more obsolete and unglamorous (Slots 1997). Though the Deselection process is a difficult task, it is encouraged due to the tremendous benefits and advantages to the collection. Because accumulation of new materials to a library collection will not take much longer time and in return the collection becomes out of date in equal rapidity (Ranganathan 1989). The library materials that are in poor physical condition discourage users and detract them from the general appearance of the collection. Further, outdated materials can obstruct and frustrate the users who are in search of information. Having nothing on a subject is considered better than having materials that are misleading, inaccurate and out of date (Dilevkeo and Gottlieb 2003).Deselection is a must at any library and it has tremendous benefits to the collection. De-acquisition should be a routine practice and should be practiced according to the institute's requirements. The books come under the capital assets of a university and any decision upon it should have followed proper guidelines. It is pathetic to know that only very few universities have documented Deselection policy to support the procedure. A documented Deselection policy will maintain the uniformity of the activity and safeguard the librarians from any future questioning on Deselection activities (Johnson 2004).

3. WHY WEED?

To put it more concisely, there are a number of reasons for Deselection of an Engineering Collection.

- It makes the collection more attractive since it removes older, damaged materials.
- It makes the collection more useful, since it removes materials that are obsolete, and therefore no longer accurate.
- It makes the collection easier to use, because useful materials are no longer "concealed" among materials that are not useful.
- It makes room for newer and more useful materials.
- It helps the staff know their collection better.
- It can serve as a collection assessment technique since it requires the staff to really look at the collection, which can lead them to know better the collection's strengths and weaknesses.
- It helps to maintain the related Engineering collection
- When libraries do not deselect regularly or consistently, members have trouble discovering interesting and relevant materials.
- Removing outdated or worn-out items makes the collection more attractive and more inviting to users.
- Members trust the library to supply information that is easy to find and current.
- It saves space and time in consonance with S R Ranganathan s five Laws of Library science.
- It can make the collection more appealing to users
- It enhances the Engineering College Library's reputation for reliability.
- It helps to locate books that need care and maintenance.
- It helps to gain constant feedback on the strengths and weaknesses of the Engineering collection.

4. OBJECTIVES OF DESELECTION

- To make the most effective use of shelf space: Shelving of library materials is inherently expensive and some areas of the collection may become overcrowded.
- Deselection may be necessary to remove materials that are not needed and provide space for new arrivals
- To increase the relevance of the existing Engineering collections to current curricular needs
- Removing outdated or irrelevant titles from the shelves facilitates browsing by students and faculty.
- To maintain the collections in an acceptable physical condition.

Factors to be considered during the Deselection process: These factors include:
- The Engineering College Library's selected service responses and resultant goals
- The needs and demands of the library's user's community
- The availability of more suitable material
- The ability of the budget to provide funds to purchase more satisfactory library materials
- The relationship of a particular item to others on that subject
- Cooperative agreements with other libraries and the ability for users to use other libraries in the area
- The degree to which the Engineering College Library serves as an archive
- The possible future usefulness of a particular Library material
- The availability of more current information on the Internet in comparison to the materials be not to be deselected
- The ability of the Engineering College Library to borrow the item through interlibrary loan

Criteria Used for Deselection:

Content:
- Outdated and obsolete information (especially on subjects that change quickly or require current information, such as computers, health and medicine, technology, etc)
- Less popular subject matter, including topics those are no longer of interest or that were dealt with due to their popularity at a specific point in time,
- Old writing style, especially material that was written quickly to meet popular interest that has passed
- Inaccurate information, including outdated information and sources that have been overcome by new titles or latest editions
- Unused sets of books (although you may keep sample volumes if they meet local needs and can be used in future for reference)
- Repetition series, especially series that are no longer popular or that were published to meet a popular demand that no longer exists
- Older editions (in general, it is unnecessary to keep more than one previous edition, discarding as new editions are added)
- Resources that are not on standard reference lists or that were never reviewed in standard reviewing sources
- Material that contains biased, racist, or sexist views
- Duplicates, especially if they are worn or tattered
- Self-published or small printed materials that are not circulating, especially if they were added as gratis

Poor Appearance:
- Worn out items
- Poorly bound or poorly printed editions
- Rebound editions that are worn out Items that are shabby, warped, pest infested, or otherwise

marked up too much, mutilated, or 'edited' by patrons
- Books with very small print or have poor quality pictures
- Scratched CDs or DVDs, or video films which have turned brittle or magnetic tape and audiocassettes)
- Media that has broken or missing parts
- Books with torn, taped, or missing pages

Nonused Materials:
- Items that have not circulated within the past 3-5 years and not actually used for reference or in-house research
- Periodicals and technical journals that are not indexed
- Periodicals and technical journals those are available in full-text databases
- Unused volumes of reference sources in sets or series
- Unneeded titles in related subject areas that are less frequently used
- Materials on the 'hot topics' that were popular more than five years ago but now very rarely used
- Formats that are no longer popular in your community, especially if the technology needed to use the format is no longer owned by people in the community for example floppies, microfische etc.
- Material that is no longer important to the collection because of changes in local variations
- Materials with old syllabus

Four key points to address in designing the Deselection system: These are
- circulation/use,
- obsolescence,
- expert opinion,
- availability outside of the collection

Guidelines for Deselection: The following guidelines have to be considered for Deselection of Engineering College Library materials:

Physical Condition:
- Brittle paper or binding of the Library material
- Unrepairable damage to the extent that the item can no longer be used
- Part of the item or pages are missing (such as an accompanying CD ROM), making the material unsuitable for use)

Collection Development and Management:
- Unused multiple copies
- Currency, comprehensiveness, accuracy, and suitability of the material
- Incomplete set of a series
- Items purchased to support programs no longer offered by the Engineering College and for which no current demand exists and are unlikely to be of scholarly interest in the future of the Engineering College.
- Lack of compatibility with collection development policies

Usage Pattern:
- Older works which are not classic, which make no contribution to the literature of a given field and which have not been used in the past ten years, as shown by the circulation statistics.
- Periodicals and technical journals which receive low use by members in the most recent two-year period and are not included in standard indexes or abstracts.

Benefits of Deselection: Studies show that regularly Deselected library collections can produce higher circulation statistics. Materials are easier to search, locate and maintain. Quality is assured in a properly Deselected collection.

The major benefits of Deselection of the collection are enumerated as under:

Save Space: For accommodating more books. A well-maintained Engineering College Library collection saves the space and also the cost of maintenance of books that are no longer in use. Members face difficulty finding needed items. The library staff will not need to over shelve or pile books on top of the racks, and the library will look attractive and will be easier to use. Best practice says that racks should never be more than 85% full (and 75% is even better). In addition, without Deselection, unused material takes up shelf space that could be used to display other recent items. The OPAC uses more database space which in turn calls for more computer memory. Not having to add more racks may even allow the library to provide, more reading space or for additional computers for browsing. Deselection allows us to maintain the open, friendly appearance that is the hallmark of a good library.

Save Time: Of members and best of all, ourselves. Being in line with Dr. S R Ranganathan's Five Laws. Racks with Deteriorated books with illegible markings eat time. Members looking for a particular document have to browse through items that are of no use. Staffs trying to shelve returned items have to go on rearranging books to make space. Excess of searches from the online catalog can lead to outdated or unusable materials thus slowing the searching and frustrating the users. Library housekeeping is made more tedious by these books and other materials.

Make The Collection More Appealing: By replacing old rebinds with attractive new books. Even all time favorites and classics benefit from being replaced by getting cleaner copies with updated covers. Circulation and library usage can be increased by simply making the shelves look more attractive and user-friendly, even if there are fewer books. It is better to have clean air and empty space on the shelves than to have smelling old books that discourages Engineering College Library usage.

Enhance Your Library's Reputation: For reliability and currency. Engineering College Library Members expect that library materials selected by experts have the up-to-date and reliable information. For many users, especially younger generation, the mere fact that a book exists in the library adds authority to it. A student will be discouraged for writing a paper based on research performed with library materials that provided obsolete information. The members believe the library provides accurate information. Members will soon conclude quickly that the library has 'nothing' of value if they search through a lot of outdated material.

Will Keep Up With Collection Needs: Because Deselection is such a strong tool that looks into the need for binding, alerts the library staff of lost or stolen items, warns about the books in need of replacement, and guarantees a more accurate book count. This process also allows for both on-going Deselection, items can be removed almost without effort, and scheduled Deselection where you look at specific areas of the collection at regular intervals. Library staffs that are involved in Deselection continuously will surely have greater knowledge of the collection.

Have Constant Feedback On The Collection's Strengths And Weaknesses: This information can be helpful when accepting gratis and making decisions about book procurements. For example, knowing that the Some Computer science books are out dated, the librarian can approach an organized group or an individual and request specific assistance in building an area of special interest and utility to them. Deselection keeps the present shape of the collection clearly in mind and helps in planning future directions for it. Deselection helps the librarian to see that every task performed in the library and the purpose of every task in relation to the users and the collection.

DESELECTION: SOME ISSUES

Decision upon Deselection: The decision upon Deselection is a crucial factor and the decision for this procedure has to be examined. In most of the cases the librarian, the library committee, or an expert panel, or a committee constituted for the purpose was found to be the vital decision maker for Deselection.

Approval for Deselection: The decision should be a collaborative effort of the Librarian, Library committee and the Management for the betterment of the Library. Or in the case of the Private Engineering College Library, it is much better to obtain the approval of Management.

Valuation of the Deselected Items: Valuation of the Deselected items was a tedious process especially when records are not properly maintained, but now with automation taking the stride value can be calculated easily, but still ambiguity remains in terms of the foreign books to be deselected where dollar conversion rates are a crucial factor

Future of the Deselected items: Deselected items should be removed from the library and it is another step to be performed in Deselection practice. Majority of the Engineering College libraries dispose the Deselected items or Sell or donate them to the needy colleges.

Items to be Retained: Items of historic value and of relevance to the Institute itself, and to the local community, items essential to the research activities of the Institute are to be retained; Final responsibility however for the de-selection of book stock rests with the Librarian.

Deselection Responsibility: One frequently asked question is: Should Deselection is done only by the head librarian? A good rule of thumb is if staff takes part in selection of materials - then they should also be involved in final Deselection decision.

5. A DESELECTION MODEL FOR ENGINEERING COLLECTIONS
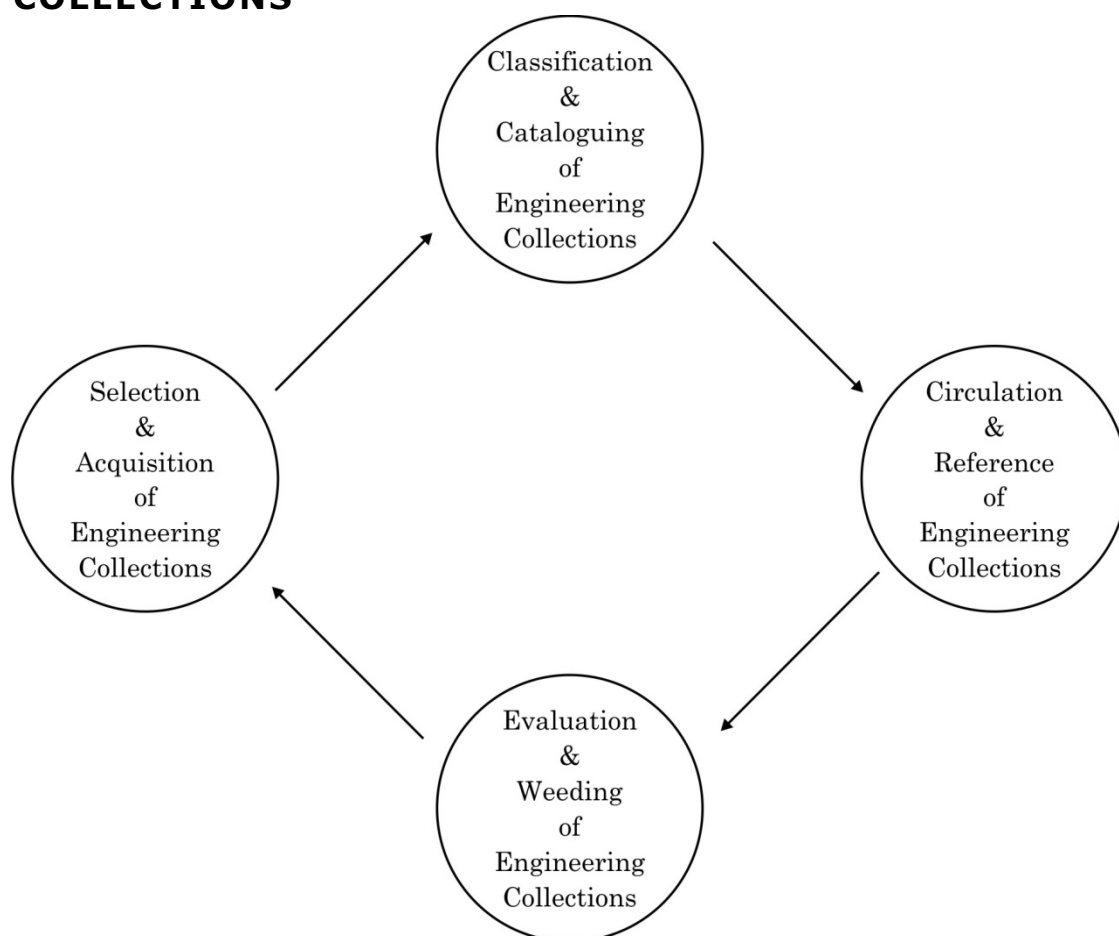
What to do with Deselected Books: Types of Disposal

Sell it: to the public, either at a large annual sale or from a continuous sale rack; or to a used book dealer or pulp dealer, usually in large lots, or through online sales.

Donate it: donate books to a neighboring Library, hospital, and nursing home, adult or jails, charitable institution, schools, or to a small library struggling toward system membership.

Trade it: with another library, or with a used book dealer, for a book your library can use.

Recycle it: by using a local contractor, perhaps in cooperation with local government agencies.

Destroy it: by burning in an incinerator or by tossing it into the trash. If the latter method is used, be sure the books won't be seen by someone passing by. Citizens might misunderstand the reasons for destroying 'valuable' books.

Transfer it: they will be sent to an academic department if so requested;

Offer it: they will be offered to other state agencies or libraries if deemed appropriate by the librarian who deselected or the Collection Development/ Electronic Resources Librarian;

Reasons for Not Deselection: The reasons for not practicing Deselection in the Engineering College Library may be as below:
- Lack of well trained staff
- Non-availability of a documented Deselection policy
- A relatively new collection
- Time bound restrictions
- Emphasis on numbers by various regulatory bodies
- Professional work pressure
- Displeasure of the community to be served
- Sacredness of the collection
- Perception that it is subjective
- Conflicting criteria

6. CONCLUSION

The paper discusses the necessity and the objectives of Deselection, along with the criteria needed to consider a book for weeding and lists the advantages of weeding in an Engineering College library. It throws light on issues we may have to face while deselecting, and also proposes a model for deselecting books in an engineering college Library and suggests methods for disposal of the deselected material

It is very important to have a national level policy on de-selection at the regulatory body level like AICTE. However, it is clear that the reasons for Deselection vary with individual Engineering College. As such there should be provisions for the College to formulate its own policies with a stipulated broader framework. A kind of flexibility should also be there to cater to specific requirements of individual institutes. As this is the ground level requirement for Deselection practice, it is a must to formulate a policy framework that can cater to the requirements of rapidly changing digital formats too. Updating the collection is the most important benefit from Deselection. So a need for national level Deselection policy for Engineering Colleges at the regulatory level is felt to be a must.

Don't delay—start Deselection today!

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COLLECTION DEVELOPMENT OF E-BOOKS IN ACADEMIC LIBRARIES : A STUDY

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ABSTRACT

Over the past few years, a new type of e-resources in the form of e-books have entered into the library collection and occupied a sizable portion of library collection and budget due to its multidimensional advantages over print books. This paper gives a brief idea on concept of e-books. Describes about the various sources form which e-books can be obtained. Discusses the various steps involved in collection development of e-book. Examines the important issues related to e-book collection development. Concludes with the remarks that academic libraries cannot side line the demands of users for e-books for more time, if they want to exist as a service institution. Hence the LIS professionals and authorities need to be open minded towards collection development of e-books in academic libraries and take it positively for their successful existence.

Key words: E-books, Collection Development, Academic Libraries.

1. INTRODUCTION

Over the past few years, a new type of e-resources in the form of e-books have entered into the library collection and occupied a sizable portion of library collection and budget due to its multidimensional advantages over print books. The main reason for this is due to publication and availability of large numbers of e-books in every subject. It is surprising to note that almost all reputed publishers ,including some Indian publishers are publishing e-books (both reference and text books).Also due to its popularity and worse market condition of print books ,some publishers have adopted a policy to publish print books on demand only. Another reason is that the Information Technology(IT) have effected all walks of life and people so also library users, who are becoming more and more IT savvy day-by-day. Accordingly library users of today are more comfortable to use e-books than its print counterparts and also are using various IT tools such as computers, laptop, tablet, mobile phones to use these e-books of the library at their convenience. The various advantages of e-books are easy to carry, easy to use, convenience, saving money and time, save in storage space, etc. Accordingly demand for e-books has increased remarkably among library users. Further, most of the libraries are running with storing space problems. Hence to cater with the changing trends and demand of users, to overcome space problems in libraries, to avoid procurement of multiple copies of books etc, libraries, more libraries particularly academic libraries of higher learning institutions have started developing their e-books collections in addition to print resources.

2. E-BOOKS: CONCEPT AND DEFINITIONS

"In 1945, Vannevar Bush for the first time mentioned about the concept of e-book in his seminal article '*As we may think*' published in *The Atlantic Monthly.* In that article, Bush described about the 'memex' a conceptual mechanical device used to store, retrieve, and display personal books, records, and documents. Taking this idea, Andries van Dam, a computer science professor at Brown University, has developed several models and interfaces for the e-books during the last three decades. Almost at the same time, Alan Kay developed the Dynabook, which is similar to today's laptop computer. Under Project Gutenberg project, on 4 July 1971, Michael Hart first time created

'Declaration of Independence' a digital book and sent it to many people over a network."[1]

E-books are electronic form of books where information are organized in a particular order similar to the print book .Although in the initial stage of e-book development ,CD-ROM version of e-books were available where as now almost all e-books are available Online. E-books form an emerging and rapidly changing scholarly platform and are becoming popular day by day. These are similar to print books but are in digital form to be accessed through computer via Internet or down able on a hardware device. According to Lee, "an e-book is a term used to describe a text analogous to a book that is in digital form to be displayed on a computer" [2]. The e-books can be read with the help of computers and e-book reader software, which enables to display the e-books on the PCs. According to Rao, "e-books are of following three types such as Web books, Palm books and Electronic ink e-Books. The web books are accessed through the web with the help of Internet and necessary e-book reader software. The three Musketeers by Alexandre Dumas is the example of a web book released by web publishing recommended by the International Digital Publishing Forum. Palm book are more portable, don not necessarily require Internet connection and can be read by handheld, battery powered computer such as Palm top. The rocket e-book sold by Nuvo media is an example of Palm book. Electronic ink e-books are currently in development stage in which electronic ink is used to display the content. The ink could be magnetized to show customized content and then reformatted for the next use"[3].

The e-books are marketed directly by publishers and also through vendors and aggregator. Some e-books are also freely available in the Internet. One can purchase e-books by pick and choose method from a large number of collections or can purchase bundles of e-books in packages defined by the publishers. The e-books are now available on one time purchase mode and also on yearly subscription mode. These e-books have occupied a remarkable portion of library collection in academic libraries more particularly in University and central Government funded libraries such as IITs and NITs libraries.

3. SOURCES OF E-BOOKS

E-books can be available through various sources as follows:

* Directly through the publisher: Now a day's almost all leading publishers are publishing books in e-books in addition to print form. Rather some publishers are publishing books in e-book form only and are publishing print books on demand only. Some of the leading e-book publishers are Elsevier, Springer, Emerald, Wiley, Taylor and Francis, McGraw Hill, Pearson and also some society publishers like ASCE, ASME, MIT press etc. These publishers directly market their e-books in libraries.
* Through the vendors: Some publishers like IEEE does not market their e-books directly. Also e-books of some society publications do not market their products directly. The e-books are marketed through vendors. Besides some publishers market their products both directly and through vendors. Some leading vendors of e-books are GIST, Gurgaon, Allied publisher subscription agency, New Delhi, Globe publications etc.
* Through aggregator: Some e-books are made available through aggregator, who takes absolute right of the e-books from various publishers and make available to libraries as their own products. Some leading aggregators of e-books are ProQuest Ebsco, Informatics (India) Limited.
* E-books through open source: Now a day's e-books are also available as open source e-books, which can be freely access and download through Internet.

4. COLLECTION DEVELOPMENT OF E-BOOKS: STEPS

Before planning to procure e-books by libraries, several aspects need to be considered such as type of users, need of users, library budget, and infrastructure facilities available to access e-books etc. Some basic steps involved in collection development of e-books are discussed below.

Study on users' need and behavioral pattern: Study on users' information need, their information seeking behavior is very much important to make an analysis on the actual need of e-books in libraries. It helps to take a decision on various aspects such as inclination of users towards print or e-books, type of e-books (whether text or reference books) are to be procured, budget to be allocated for procurement of e-books etc.

Identification and Location: The next step is to identify and locate the e-books. Identification and location of the required e-books is the job of the LIS professionals who identifies and locates the required e-books to meets the information needs of their clientele. The professionals have to collect various information such as bibliographical details, access and download facilities, license agreement, price, platform fees, training provision etc.

Trail Access or Demonstration: Before acquisition of e-books, it needs to be tested/examined properly to know its merits, demerits and relevance and thereby help professionals to take a decision about its procurement. Hence a demonstration or trial access is required before the procurement of e-books, which helps to identify the respective users and obtains feedback.

Selection, Negotiation and Acquisition: After the trial/demonstration and evaluation of e-books, the next step is to select the required e-books and negotiate with the publishers/vendor/aggregator on the aspects such as price, payment mode, availability (single or bundle), access provision, platform fees, usage reports etc. The acquisition process is same as the acquisition process of print documents involving steps like ordering, receiving (activation of e-book access), payment etc but with certain additional level of works such as signing license agreement etc.

Access Facilities: Access to e-books can be made either through institute IPs or through user IDs and password provided by the publishers. In e-book collection development process, it is highly essential to ensure the access facilities to users through adequate infrastructure facilities like availability of computer, high speed Internet connectivity, Wi-Fi connection etc, and otherwise procurement of e-books does not serve any purpose. Also LIS professionals should facilitates optimum use of e-books by giving direct links in institute/library website, making A-Z list of e-books, making available in OPAC, discovery services etc. Besides training programs for users to use e-books need to arrange by the library on regular basis.

Renewal or New Addition: Normally e-books are procured through one time purchase mode. But keeping pace with the market conditions and demands, some aggregators provide e-books on yearly subscription mode also. Besides e-books collections of publishers need to procure every year to build a proper collection of e-books. Hence for renewal of e-book subscription or addition of new collections of publishers, the usage report need to be analyzed at regular interval and there by users need for a particular collection, e-books of a particular publishers etc can be properly ascertain.

5. ISSUES ASSOCIATED WITH COLLECTION DEVELOPMENT

Collection development of e-books is a complicated process, which involves various issues related to selection, procurement, access and retention in the library. These issues need to be properly addressed by the libraries .The basic issues associated with the collection development of e-books are discussed below.

Identification and Selection of e-books: The identification and selection of e-books is becoming a complicated task day by day for the LIS professionals due to tremendous increase in numbers and types of e-books in almost every field of knowledge. Further lack of detail information and proper documentation, shortage of library staff to go through each and every e-book in details, limitation of time period for trial access, ever changing demand of users, limitation of library budget etc make the e-books selection process more complicated.

License Agreement: License agreement is a major and new issue in e-books collection development

process for almost all libraries. The main problem is that there is no standard e-book license agreement of all e-book publishers; rather every publisher has different license agreement. Again the license agreement are made by the publishers and there is no or limited scope to prepare the agreement by the consent of both publishers and libraries. Besides, lack of knowledge on legal issues of license agreement by the LIS professionals adds new problems to the problem.

Unfair marketing policy of the e-resource publishers/aggregators: It has been a common phenomenon for most e-book publishers and vendors to market their products in bundles with various pricing model by which they compel libraries to subscribe/procure numbers of useless e-books along with limited useful resources. It has created problems for libraries to satisfy the need of users although libraries subscribes to a large number of e-books. Besides most of the publishers market their products directly and also through vendor/aggregators which creates confusion on pricing structure, embargo factors etc and creates problems for LIS professionals to convenience the authorities. Also various lucrative offers such as provision of complimentary access subscribe one and get one/two or freer etc to market the less used products by the publishers/vendors/aggregators creates problems in subscribing right decision in selection and procurement of e-resources

No role of Library consortia: It is quite good to note that large numbers library consortia such as AICTE consortium, NDEST-AICTE consortium, UGC-Infonet consortium, IIM consortium, etc have been formed to look in to the matter related e-resources by the libraries. But none of the library consortia deals with e-books limiting their role to e-journals only. Hence in the absence of a standard policy, price and license agreement, individual libraries suffers a lot.

Poor Infrastructure facilities of libraries to access e-books: Most of the academic libraries run with poor infrastructure facilities i.e. in terms of configuration and numbers of computers and other peripheral devices to provide e-book access facilities satisfactorily to users. Such situations create problems for LIS professionals in meeting the demands of the users satisfactorily and consequently creates adverse environment for e-books collection development. 5.6.Lack of autonomy in decision making process: it is a common practice in almost every academic libraries that libraries are headed by a Professor In-charge or Chairman ,Library committee (a non LIS professional) who dictates the Librarian leaving no or very limited autonomy for Library managers to take decisions in the interest of libraries. Also it is very common in most academic libraries that all recommendations for procurement for library resources including e-books are made by the Head of the various departments and not by the Librarian. Very often it leads to biased and unwanted recommendations for e-resources, where LIS professionals have no other option but to compromise with the situation and accordingly a major portion of library budget are wasted unnecessarily.

Poor learning provision for Library & Information Science (LIS) professionals: It is a fact that with the changing library environment, the LIS schools of Indian Universities have brought remarkable changes in their course curriculum with the introduction of subjects on ICT and its applications in libraries, but most of the syllabi lacks courses on e-resource procurement process, license agreement and legal issues associated with this etc. Also very few training programs are organized on these aspects of LIS. Thus the working LIS professionals and also LIS students, who are the future librarians feels helpless in their work environment, leading to a confusing situation.

6. CONCLUSION

Although the concept of e-books in academic libraries is not very common and old, still it is gaining popularity day by day among library users .In spite of manifold advantages of e-books over its print counterparts, some sections of LIS professionals and library authorities feel e-books as useless resources and think its procurement as wastage of library budget. They consider e-books as a status symbol for library. But such negative thought prove to be wrong since more and more academic libraries are developing e-book collection and users inclination towards e-books has increased tremendously in academic libraries.

The academic libraries environment are gradually becoming more IT oriented with changes in library collection, organization, services and users inclination towards IT based tools and services. Keeping pace with the changing trends of users towards e-resources, academic libraries need to develop their e-books collection most judiciously and selectively. In this context a well define collection development policy for e-books should be framed by the libraries taking into consideration its various aspects such as type of e-books to be procured, procurement mode of e-books, license agreement, download facilities, copyright issues, amount of budget to be allotted from library main budget, infrastructure facilities to be developed, access provision to be made for e-books etc. It is fact that the academic libraries cannot side line the demands of users for e-books for more time, if they want to exist as a service institution. Hence the LIS professionals and authorities need to be opening minded towards collection development of e-books in academic libraries and take it positively for their successful existence.

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Section II
ICT AND CONTENT MANAGEMENT

EXPERT SYSTEM : AN ELECTRONIC TOOL FOR MANAGING DIGITISED INFORMATION

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1. INTRODUCTION

There are varieties of electronic tools for managing the digitalised information. Expert system is one of them. An expert system is software, made up of computer programmes designed and developed to handle expert knowledge that provides expert information when the concerned expert is not available. Expert system is one of the important application oriented branches of Artificial Intelligence. In other words Expert systems technology derives from the research discipline of Artificial Intelligence, a branch of Computer Science concerned with the design and implementation of programs, which are capable of emulating human cognitive skills such as problem solving, visual perception and language understanding. Based on literature reviews, Lancaster and Warner report expert systems (ES) as the most-applied library use of Artificial Intelligence. One of the largest areas of applications of artificial intelligence is in expert systems, or knowledge based systems as they are often known. In the past decade, a great deal of expert systems had been developed and applied to many fields such as office automation, science, and medicine.

2. DEFINITION AND MEANING

If basic definitions from some introductory texts on expert systems are examined then it is found that only two elements are consistently cited:

- An expert system embodies some representation of knowledge about a given task domain.
- The expert system emulates the capabilities of a human within the given task domain at a level of performance equivalent to an 'expert' (Dubey, 1996). "... a computer program that behaves like a human expert in some useful ways." (Winston & Prendergast, 1984, p.6).

 Whitaker and Ostbergs (1988) have observed that these requirements presuppose that the task domain is of such a nature that consistent facts about it can be derived, i.e., there is knowledge about the domain and that there is differential distribution of said knowledge among some population. Such presumptions address the character of the task domain into which an expert system is inserted. In contrast, much of the literature emphasise on the expert system's structure. Most commonly the discussion on an expert system's structure concentrates on two discrete components-a knowledge base, and an inference engine.

An Expert System is a computer programme that represents and reasons with knowledge of some specialised subject for solving problems or giving advice. In other words, an Expert System is a programme that manifests some combinations of concepts, procedures, and techniques allow people to design and develop computer systems that use knowledge and inference technique to analyse and solve problems. Expert Systems are computer based system which can replace human experts to an extent by helping the users to take decisions. An expert system is a computer program, with a set of rules encapsulating knowledge about a particular problem domain (i.e., medicine, chemistry, finance, flight, et cetera). These rules prescribe actions to take when certain conditions hold, and define the effect of the action on deductions or data. The expert system, seemingly, uses reasoning capabilities to reach conclusions or to perform analytical tasks. Expert systems that record the

knowledge needed to solve a problem as a collection of rules stored in a knowledge-base are called rule-based systems.

3. COMPONENTS OF AN EXPERT SYSTEM

There are five components of an expert system, viz. Expert Editor, Knowledge base, Inference engine, User interface, Solution and advice.

- *Expert Editor* is the component that allows the creator of the programme or the 'Human Expert' to input information into the knowledge base. The information has to be fed into the system in a specified format.
- *Knowledge Base* is the brain of an Expert System. It is here where information has been gathered on all facts and knowledge that a human expert can provide. The knowledge base consists of a certain objects and the relationship that exists among the objects. A knowledge base contains the information acquired by interviewing experts, and logic rules that govern how that information is applied. The knowledge base of expert systems contains both factual and heuristic knowledge. Factual knowledge is that knowledge of the task domain that is widely shared, typically found in textbooks or journals, and commonly agreed upon by those knowledgeable in the particular field.

Heuristic knowledge is the less rigorous, more experiential, more judgmental knowledge of performance. In contrast to factual knowledge, heuristic knowledge is rarely discussed, and is largely individualistic. It is the knowledge of good practice, good judgment, and plausible reasoning in the field. It is the knowledge that underlies the "art of good guessing."

- *Inference Engine* contains the logical programming to examine the information provided by the user as well as the facts and rules specified within the knowledge base. It evaluates the current problem. The inference engine (software) is that the part of the programme containing reasoning capability. It interacts with a knowledge base which contains information about how to solve problems within the problems domain. Juxtaposed to this the global memory where the knowledge based system records information relating to a specific problem that it is trying to solve.
- *User Interface* component is the programme which facilitates a two-way interaction between the user and the system. User interface is the component which enables the user to communicate with the expert system. Interface that allows the user to express the problem in a human language such as English. Most expert systems are interactive; they need 'users to input information about a particular situation before they can offer advice. A good user interface is an expert system that will allow the user':
    - o to ask question, such as why an advice has been given, how a conclusion has been reached or why certain information is needed
    - o to volunteer information before being asked
    - o to change a previous answer
    - o to ask for context-sensitive help on demand
    - o to examine the state of reasoning at any time
    - o to save a session in disk for later perusal, and
    - o To resume a session previously abandoned mid-way (Forsyth, R. (Ed.) (1984).
- *Solution and Advice* is the final component of an expert system where a result has been generated from the knowledge base and the solution will be provided to the user with the help of user interface.

4. CHARACTERISTICS OF ES

According to Forsyth (1984), the expert systems have the following characteristics:

- Limited to a specific domain of expertise.
- Able to reason with uncertain data.

- Able to explain itself in a sensible way.
- Delivering advice as output.
- Designed to grow incrementally.
- Having a clear separation of knowledge and inference mechanism.
- Typically (not necessarily) rule-based.
- Always restricted to a narrow domain of expertise.
- The expertise is acquired and codified during lengthy' interviews with one or .more experts in the relevant domain.
- The expertise is codified as a collection of facts and rules, which together constitutes the knowledge base.
- The rules may be held as discrete production rules, or as a semantic network, or occasionally in some other way.

5. EXPERT SYSTEM VS CONVENTIONAL COMPUTER PROGRAMMES

Expert System are computer programmes that are different from conventional computer programmes as they solve problems by mimicking human reasoning processes, relying on the logic, belief and experiences. The most commonly known type of knowledge based system is the rule based expert system in which the experience and knowledge of a human expert is captured in the form of IF-THEN rules and facts which are used to solve problems. In general terms their objective is to generate expert advice for use by a decision maker. In conventional computer programs, problem-solving knowledge is encoded in program logic and program-resident data structures. Expert systems differ from conventional programs both in the way problem knowledge is stored and used.

Why Should We Start An Expert System?
- capture the experience from the experts available;
- make better distribution of human resources;
- help in making better decisions (thus saving time and money);
- free the experts from routine tasks;
- ensure continuous operation in the absence of the experts; and
- Improve the quality of library operations.

6. TYPES OF EXPERT SYSTEM

The capabilities of Expert System can be broadly categorised under two groups namely **Autonomous and Knowledge based.**

Autonomous Expert System operates automatically without any human intervention and makes decision on its own. But this type of Expert System is rarely used. Majority of Expert system is knowledge based.

Knowledge based expert system contains a set of assertions that explains certain facts such as TRUE or FALSE and IF and THEN conditions.

Further, expert system can be also categorised as follows:
- *Interpretative*   To infer situation description from data
- *Diagnostic*   To analyse system performance so as to high light malfunctions of people, system or organizational performance
- *Design*   To design objects
- *Planning*   To propose courses of action under different scenarios
- *Monitoring*   To compare and evaluate actual observation against plan
- *Education & Training*   To design self-learning tool

- ***Control***   To diagnose, debug, repair and monitor system behaviours

7. APPLICATION AREAS OF EXPERT SYSTEM

Expert System has been applied in various fields of knowledge for a variety of purpose. Few examples have been discussed below:

- Expert System is very popular in the field of medicine. MYCIN is one of the pioneer ES which was designed for the diagnosis and therapy recommendations for infectious blood disease.
- DENDRAL is used for interpreting data from mass spectrometer. It was widely used by chemists for research.
- PROSPECTOR system was developed to assist Geologists in mineral exploration.
- PROJEVAL is an ES used for Agricultural project evaluation in developing countries to carry out project selection.
- PC_KANDID is a diagnostic system for neuromuscular disorders, which was developed by using PROLOG.

8. APPLICATIONS OF ES IN INFORMATION MANAGEMENT

In modern times, due tremendous growth and application of ICT in library activities, the library professionals have started to venture the Expert system which is an advanced technology and used this versatile tool in their subject field. According to Dr. T.V.U. Kiran Kumar,"Some of the areas where AI and ES application is possible like- information collection, selection and organization and dissemination of information. So in each case AI and ES application is possible like through data mining and warehousing tool. Here business tools help to organize and retrieve information as per time, and availability is also possible within a short period".

In classification AI and ES use of classification is possible. Classification is a system or mechanism or we can say concept. Classification is classification of document according to subject or discipline or nature, so here human efforts are needed to identity the actual subject but in many simple subject AI based computer can directly give classification number, as per pre loaded classification scheme or schedule like."The following are some of the examples:

- ES for OCLC automated title page project was developed by Staurt Weibel in USA.
- MAPPER was developed by Zorona Ercegovac, for explaining the rules for cataloguing maps.
- CATALYDT was developed Strathclyde University which serves as consultants to the cataloguer on the choice of access points.
- CAT TUTOR developed by the National Agricultural Library in USA which educates the fresh cataloguers in creating bibliographic records for computer files.

9. LIMITATIONS

Expert System has following limitations:

- ES can never include common sense
- It can never totally substitute for people
- It cannot judge, since it requires deep knowledge and wisdom
- It's effectiveness depends on the knowledge included in the system
- Performance is also constrained by the hardware and software used to design ES
- Usually only a very narrow domain area is represented in ES
- Incomplete data or rules will lead to wrong decisions.
- The most common disadvantage cited for expert systems in the academic literature is the knowledge acquisition problem.
- Performance was especially problematic for early expert systems as they were built using tools that featured interpreted rather than compiled code such as Lisp.

10.   ADVANTAGES OF EXPERT SYSTEM OVER A DATABASE

From the researcher's point of view knowledge base generated in an expert system has a potential capability to organise and synthesize knowledge of different types. It is possible to focus and apply diverse avenues of research to solve difficult problems and link together quantitative data, simulation models and basic research results into a knowledge based model. The idea of an expert system is shifting the focus of the research community to knowledge dissemination in contrast to knowledge accumulation.

In other words ES has the following Advantages over Database:

- Able to handle uncertain information
- Provides user friendly inter-action
- Allows convenient modification of knowledge
- Has the ability to imitate human thoughts and reasoning
- Provides a frame work to capture and apply non-algorithmic knowledge
- Offers expert recommendations to users
- *Permanence* - Expert systems do not forget, but human experts may
- *Reproducibility* - Many copies of an expert system can be made, but training new human
- *Experts is time*-consuming and expensive
- *Efficiency* - can increase throughput and decrease personnel costs. Although expert systems are expensive to build and maintain, they are inexpensive to operate. Development and maintenance costs can be spread over many users. The overall cost can be quite reasonable when compared to expensive and scarce human experts.
- *Consistency* - With expert systems similar transactions handled in the same way. The system will make comparable recommendations for like situations. Humans are influenced by recency effects (most recent information having a disproportionate impact on judgment) and primacy effects (early information dominates the judgment).
- *Documentation* - An expert system can provide permanent documentation of the decision process.
- *Completeness* - An expert system can review all the transactions, a human expert can only review a sample.
- *Timeliness* - Fraud and/or errors can be prevented. Information is available sooner for decision making
- *Breadth* - The knowledge of multiple human experts can be combined to give a system more breadth that a single person is likely to achieve (Carol E. Brown and Daniel E. O'Leary, 1995).

The above characteristics cannot be brought in a general data base system. Data base system have only a specific structured format which will facilitate retrieval of information which has to be further enhanced by adding knowledge to make it suitable to solve any problem. Hence an Expert System consists of knowledge base and not just a database.

11.   CONCLUSION

Despite its earlier high hopes, expert systems technology has found application only in areas where information can be reduced to a set of computational rules, such as insurance underwriting or some aspects of securities trading. It is also called rule based system.

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ACADEMIC LIBRARY SERVICES THROUGH CLOUD COMPUTING

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1. INTRODUCTION

Cloud computing is emerged as one of the most popular virtual technology for libraries to deliver the services in an effective manner. Cloud computing contains features of different technologies including utility computing, grid computing, unified computing, web 2.0, service oriented architecture and so on. Cloud computing technology is offering great advantages for libraries to connect their services not only promptly but also in new formats with the flexibilities such as pay as you use model, access anywhere, any time and so on. Though the usages of cloud computing may vary with the libraries nature, services and information needs but most common usages of cloud computing with in libraries can be development of digital libraries, corporate cataloging, acquisition, storages and sharing the resources on virtual environment on the web. The need of cloud computing may occur due to the information explosion, problems in accessing the information, save the time of the users and staff, resource sharing problems, problems in library. Resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction

2. WHAT IS CLOUD COMPUTING

Cloud computing impacts library functions from public service through to library systems. It is useful for many subject specialty libraries ranging from the humanities to the sciences.

- Cloud computing is a term describes the means of delivering any and all information technology–from computing power to computing infrastructure, applications, business processes, and personal collaboration- to an end user as a service whenever and wherever they require it. Cloud computing is an emerging style of computing where applications, data and resources are provided to the users as a service over the web.
- If you've used Gmail, Google Docs, YouTube, or Hotmail - you've used cloud computing. "Cloud computing is Internet-based computing, whereby shared resources, software, and information are provided to computers and other devices on demand through the Internet" (Wikipedia, 2010).
- In other words, information and software do not need to be stored on your personal computer. This abstraction of hardware and software allows you to take different approaches in selecting and implementing library services. Here is a video introduction to cloud computing: http://www.commoncraft.com/cloud-computing-video
- According to the National Institute of Standards and Technology (NIST) definition (2009), 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. Cloud computing is a model for delivery of resources as a service.

3. WHY CLOUD COMPUTING

- **Shared Resources** are the shared pool of IT resources, such as applications, processors, storage and databases.
- **On-Demand** allows users to call up resource from the cloud and use them as needed. When the

user is finished with the resources they release them in a self-service fashion.

- **Elasticity**, or flexibility that includes scalability, allows the cloud to be dynamic to the user's demands allowing the cloud to satisfy peak demands and then release resources when demand subsides.
- **Networked access** allows the cloud to be accessible widely, primarily though the internet.
- **Usage-Based Metering** allows users of the cloud to pay for the services when needed and used and to release them when they are no longer need, resulting in many benefits including cost and storage efficiency.
- **Location independent resource pooling** a cloud service provider pooled together the computing resources in a system or server that supports multi-tenant usage. There is a sense of location-independence, which is that the client generally has no control or knowledge about the location from where the services are located. Examples of resources include storage, processing, memory, network bandwidth, connectivity and virtual machines.
- Lastly, the measured service the use of cloud computing resources are measured, audited and reported to the client based on metered system. In this system a client can be charged on a known metrics such as amount of storage used, number of transactions, on bandwidth, amount of processing power used and so forth. On the basis of the level of service they charged from the client or the user.

4. TYPES OF CLOUD COMPUTING

Cloud computing can be distinct into following two set of models:

Deployment Models: This refers to the location and management of the cloud's infrastructure. Deployment models are of four type's viz. (Public cloud: Private cloud, Hybrid cloud, Community cloud).

- The public cloud infrastructure is available for public use alternatively for an organization or an industry group and it is owned by an organization selling cloud.
- In private cloud an organization turns its IT environment into cloud and uses it to deliver services to their users. Private cloud will facilitate user to store and disseminate their data on respective cloud (e.g. institutional cloud, eBay).
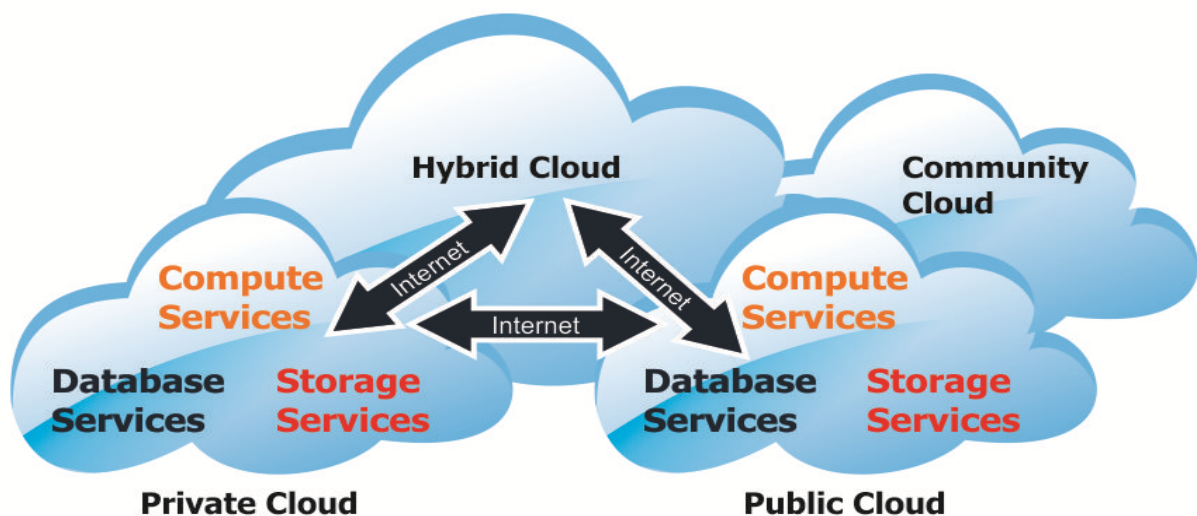

- A hybrid cloud may offer standardize or proprietary access to data and applications, as well as

application portability. An example of hybrid clouds is Google Apps.

- Community clouds are specifically 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 for by the third party (e.g. Institutional Gmail of Google Apps).services. Rack space, Amazon, Google, Microsoft Azure, IBM offerings are examples of public clouds.

Service Models: This is particularly based on type of services that any user can access on a cloud computing platform (Software as a service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS).
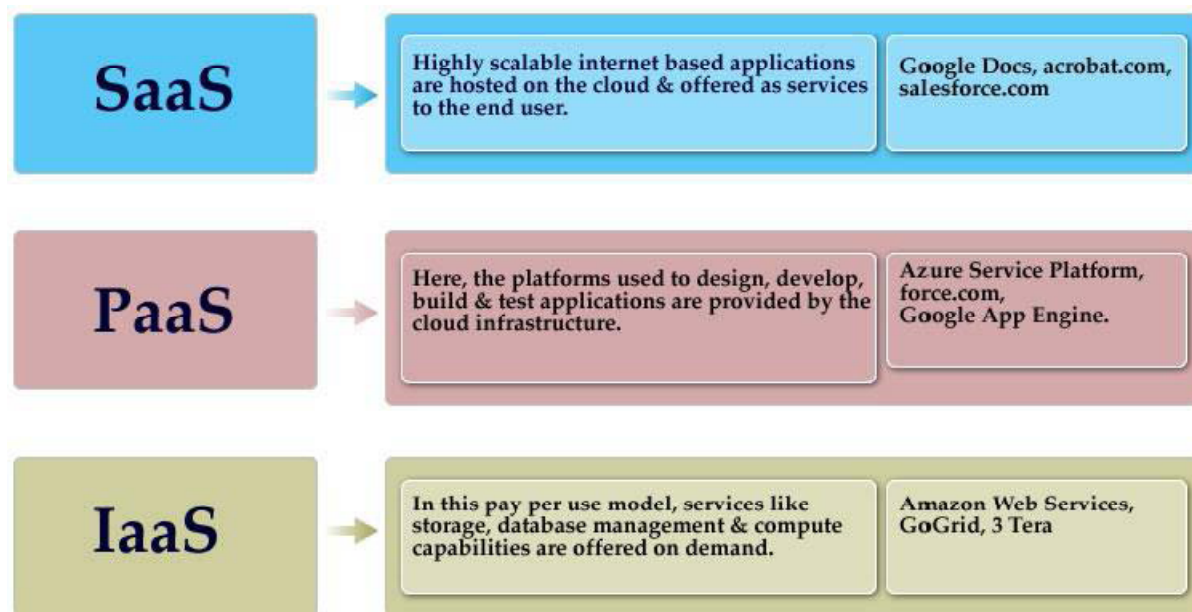
5. WORKING OF CLOUD COMPUTING

Cloud computing system can be divided it into two sections: the front end and the back end. They connect to each other through a network, usually the Internet. The front end is the side the computer user, or client, sees. The backend is the "cloud" section of the system. On the back end there are various computers, servers and data storage systems that create the "cloud" of computing services. A central server administers the system, monitoring traffic and client demands to ensure everything runs smoothly. It follows a set of rules called protocols Servers and remote computers do most of the work and store the data.

6. ACADEMIC LIBRARIES USING CLOUD COMPUTING TO ENHANCE DIFFERENT SERVICE AREAS

- **Educational Initiatives -** (e.g., outreach to students, instructional support)
- **Scholarly Communications-** (e.g., digital repositories)
- **Public Services -**(e.g., enhancing online conversations with patrons)
- **Library Systems-** (e.g., catalogs, discovery systems, request management   System)

Building Digital Library/Repositories: In connection to cloud based digital library software, Dura space is having two software namely Dspace and Fedora Commons but Dspace is widely used for building digital libraries/ repositories relative to Fedora Commons. Dura cloud provides complete solutions for developing digital libraries/ repositories with standard interfaces and open source codes for the both software.

Searching Library Data: OCLC World Cat service is one of the popular service for searching library data now is available on the cloud. OCLC is offering various services pertain to circulation, cataloguing, acquisition and other library related services on cloud platform through the 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.

Website Hosting: Website hosting is one of the earliest adoptions of cloud computing as many organizations including libraries preferred to host their websites on third party service providers rather than hosting and maintaining their own servers Google Sites serves as an example of a service for hosting websites outside of the library's servers and allowing for multiple editors to access the site from varied locations. The District of Columbia Public Library is using Amazon's EC2 (Elastic Computing Cloud) service to host their website and it provides libraries with rapid scalability and redundancy.

Searching Scholarly Content: Knimbus is cloud based research platform facilitates to discover and share the scholarly content. Knimbus stands for Knowledge Cloud which is dedicated to knowledge discovery and collaborative space for researchers and scholars. Currently, Information and Library Network (INFLIBNET) Centre (http://www.inflibnet.ac.in) has been incorporated Knimbus cloud service into its UGC INFONET Digital Library Consortium in order to search and retrieve scholarly contents attached therein.

File Storage: To access any files on the internet, cloud computing present number of services such as Flicker, Dropbox, Jungle Disk, Google Doc, Sky Drive and so on. Therefore, libraries can get advantages of such cloud based services for various purposes. For instance, LOCKSS (Lots of Copies Keeps Stuff Safe), CLOCKSS (Controlled LOCKSS) and Portico tools are extensively used for digital preservation purpose by libraries and other organizations.

Building Community Power: The most famous social networking services viz. Twitter and Facebook which play a key role in building community power. This cooperative effort of libraries will create time saving, efficiencies and wider make cloud based services as a reliable medium to disseminate library services to their target users with ease of use and trustworthiness.

Library Automation: For library automation purpose, Polaris provides variant cloud based services such as acquisitions, cataloguing, process system, digital contents and provision for inclusion of cutting edge technologies used in libraries and also supports various standards such as MARC21, XML, Z39.50, Unicode and so on which directly related to library and information science area.

When the library systems are deployed as open cloud solutions then the library community itself can step up to create extensions to their core services and more importantly share them throughout the community using cloud computing.

Table: Use of Cloud Services

Cloud Services	Popular Service Providers
Mailing Services	Gmail, Yahoo, India, Sify, Hotmail Gawab, Fastmail, Mail, Care, Lycos
Forums	Voice thread, Now comment, LIS forum, LIS links, India talks
Custom Social networking	Facebook, Twitter, Ning, Pin interest
Information collection	Google forms, Survey monkey, ProProfs, Zuhu creator, Wu Foo, Zoomerang
Calendar	Google Calendar, Hotmail Calendar.
File Sharing	Google Drive, Slide Share, Drop box
Video & Presentation	You Tube, Google, Presentation, Time glider, Prezi, Screen Cast

Software & Applications	Google Sites, Zotero, Bundle Nut
Storage	Open drive, Online storage, Carbonite, Just cloud, You Send It, Dropbox
Operating Systems	Cloudo, My Goya, Eye, Kohive
Office applications	Google Docs, MS Office Online, Cloudcanvas

7. ADVANTAGES OF CLOUD COMPUTING IN LIBRARIES

- Cost saving
- Flexibility and innovation
- User centric
- Openness
- Transparency
- Inter-operability
- Representation
- Availability anytime anywhere
- Connect and Converse
- Create and collaborate

8. EXAMPLES OF CLOUD LIBRARIES

- OCLC
- Library of Congress (LC)
- Exlibris
- Polaris
- Scribd
- Discovery Service
- Google Docs / Google Scholar
- Worldcat
- Encore

9. SOME INSTITUTIONS ARE USE CLOUD COMPUTING LIBRARY SERVICES IN INDIA

Sl. No.	Name of Institution	Name of Library	Web Site of Library
1	Visva-Bharati University (VBU)	Central Library	http://14.139.211.2/index1.html
2	University of Hyderabad (UOH), Andhra Pradesh	Indira Gandhi Memorial Library	http://igmlnet.uohyd.ac.in:8000/
3	University of Delhi (UOD), Delhi	Delhi University Library System	http://crl.du.ac.in/
4	Maulana Azad National Urdu University (MANU), Hyderabad	Central Library	http://www.manuu.ac.in/central_library.php

5	Jawaharlal Nehru University (JNU), New Delhi	Central Library	http://www.jnu.ac.in/Library/
6	Mahatma Gandhi Antarrashtriya Hindi Vishwavidyalaya (MGAHV), Maharashtra	Mahapandit Rahul Sanskritayan Central Library	http://14.139.120.141/cgi-bin/koha/opac-main.pl
7	Indira Gandhi National Open University (IGNOU), New Delhi	Library Documentation Division	http://www.ignou.ac.in/ignou/aboutignou/division/ldd/services
8	Assam University (AU), Silchar	Rabindra Library	http://www.aus.ac.in/library_services.html
9	Banaras Hindu University (BHU), Uttar Pradesh	Sayaji Rao Gaekwad Library	http://www.bhu.ac.in/bhulibrary/index.html
10	Jamia Millia Islamia (JMI), New Delhi	Zakir Hussain Library	http://jmi.ac.in/studyatjamia/library

10. CONCLUSION

Cloud computing builds on decades of research in virtualization, distributed computing, utility computing, more recently networking, and web software services. It implies a service oriented architecture, reduced information technology overhead forth end-user, great flexibility, reduced total cost of ownership, on demand services and many other things. Librarians are using various tools provided by OCLC, ExLibris, Duraspace & KB+ which are dedicated to library services. Librarians support the idea of introducing cloud computing into the library and are desirous of various services that can be implemented on the cloud platform. Libraries have the opportunity to improve their services and relevance in today's information society.

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DIGITAL OBJECT IDENTIFIERS (DOIS) : AN OVERVIEW

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ABSTRACT

Digital Object Identifiers (DOIs) are persistent identifications that are assigned to any entity in order to manage intellectual content on digital networks. The DOI system has been managed by an open membership consortium, the International DOI Foundation (IDF), founded in 1998. Usage of the DOI system is cross-industry beyond academic publishing. This article provides an overview of what a DOI is; the structure of DOI; DOI registration agencies (RA); metadata associated with DOIs, and advantages for libraries.

Keywords: Digital Object Identifier, International DOI Foundation.

1. INTRODUCTION

The Digital Object Identifier (DOI) is a system for interoperable identifying and exchanging intellectual property in the digital environment [1]. It provides an extensible framework for managing intellectual content in any form at any level of granularity for linking customers with content suppliers, facilitating electronic commerce, and enabling automated copyright management for all types of media. The DOI is a unique, persistent, managed, international public identifier.

Norman Paskin defines, "DOI is a unique identifier of a piece of content and a system to access that content digitally- in essence, an ISBN for the 21st Century" [2].

The Digital object identifier (DOI) is a system for identifying content objects in the digital environment. DOIs are names assigned to any entity for use on digital networks. They are used to provide current information, including where they (or information about them) can be found on the Internet. Information about a digital object may change over time, including where to find it, but its DOI will not change [3].

Like the Universal Product Code (UPS) bar code used on virtually every physical product, digital objects are identified by DOIs. Since its introduction, the DOI has provided a stable, persistent link between content and a directory on the Internet to which the content owner wishes the DOI to point instead of a Web address or URL.

The DOI is also used as an important emerging international standard for identification of published material online. Today many scientific journal publishers are using the DOI to enable readers to move seamlessly across the Internet from one location to another. Using DOI makes managing digital objects in a networked environment much easier and more convenient for both publishers and their customers. The usages of the DOIs are also very broad. Even though applications of the DOI were first applied within the publishing industry, they extend well beyond the publishing industry, especially for electronic commerce applications.

2. DOI: STRUCTURE

A DOI is an alphanumeric string or name that identifies digital content, such as an e-book, a journal article, or a piece of music. The DOI contains two components: the prefix and the suffix separated by a forward slash ("/"). The prefix, also known as the "Publisher ID," is assigned by a DOI registration agency (the Directory Manager) to the publisher. Organizations may choose to have multiple prefixes for each of their imprints or product lines. All prefixes begin with "10" (this distinguishes a DOI from any other implementation of the Handle System, followed by a period (".") and then a number designating the organization or publisher.

Example: Oxford University Press is 10.1093; Elsevier is 10.1016; and IEEE is 10.1109 etc.

The suffix, also known as the "Item ID," is assigned by the publisher and can be made up of any alphanumeric sequence of characters as long as each object can be uniquely identified. The length of the number can reach 128 characters. An existing standard identification system number, such as ISBN or ISSN, may be incorporated in a DOI by using it as the suffix.

Example incorporating ISBN into DOI with the ISBN is 0071381317 for the electronic version of the book 21 Leaders for the 21st Century—How Innovative Leaders Manage in the Digital Age by Fons Trompenaars and Charles Hampden-Turner published by McGraw-Hill. DOI is 10.1036/0071381317 (10.1036 represents McGraw-Hill).

Components of DOI

Prefix Suffix

10.1109/ITNG.2009.161
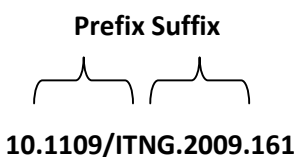
The DOI can also be applied at any level of "granularity" or for any file types (such as text, image, or audio-video). For a publisher, it can be applied to a whole book and also to every chapter, every illustration, photograph, or table. In the case of music, it can identify a CD collection, as well as every individual track. As an example, the DOI for Mona Lisa (painting) by Leonardo Da Vinci is 10.1219/10223954 (10.1219: DOI for Corbis [a corporate site of creative images]). The suffix directory database (the DOI repository) is maintained by the publisher. Once a DOI is registered and assigned, it will not be changed during its lifetime even if the ownership and location of an object change. This makes DOIs permanent and persistent identifiers. When a digital object has been requested, a query will be sent to the DOI server (a piece of software also called a link resolver). The DOI server will find the record of the DOI and the address of its associated object and send the location back to the user's browser and then show it on the user's screen.

DOI can be part of an OpenURL to solve the problem of moving users from citations to the full-text electronic journals that may available to them via dynamically created links. By using this new technology, patrons will be able to access the full-text journal articles or other resources available in the library with just a few clicks. Seamless access to a library's e-journal collections through this linking service has tremendously improved library service and the use of library resources.

3. THE INTERNATIONAL DOI FOUNDATION (IDF)

The authority administering the DOI system is the not for-profit International DOI Foundation (IDF). The Foundation was set up by the Association of American Publishers, which joined forces with the International Publishers Association and the International Association of Scientific Technical and Medical Publishers. The International DOI Foundation (IDF) supports the needs of the intellectual property community in the digital environment by developing and promoting the DOI system as a

common infrastructure for content management. The foundation will govern the use of DOIs and the IDF is governed by its members through an elected board. Members of the board represent a wide cross section of organizations interested in the management of intellectual property in the network environment. The board is responsible for all aspects of management of the DOI System, particularly policy formulation and standards maintenance. Board members include representatives from Elsevier, John Wiley & Sons, Springer SBM, etc.

4. THE CENTRAL DOI DIRECTORY : MAINTAINED BY DOI REGISTRATION AGENCIES (RA)

The DOI directory serves as the middleman between user and the information content holder/publisher. Since digital content may change location or ownership over time, a central DOI depository directory has been used for the DOI system and is maintained by DOI registration agencies (RA). When the DOI system was first launched, the IDF was the only registration agency. Due to the expansion and development of DOI names, more RAs have been franchised. RAs should be able to implement mechanisms for quality control of DOIs and metadata registration and have the abilities to support and promote multiple resolutions. RAs will assign prefixes to new registrants in accordance with IDF standard terms. RAs will also make sure that DOIs under this prefix are loaded with corresponding URLs into a globally available resolution system nominated by the IDF. RAs ensure appropriate minimal supporting metadata for each DOI and usually charge the clients (registrants) based on prefix allocation, numbers of DOIs allocated, and/or numbers of DOIs resolved.

Each RA has a geographical basis and each RAwill be required to become a member of the IDF under the "registration agency" category of membership. The IDF Board will be responsible for considering all applications submitted by candidate registration agencies. RA membership allows participation in the Registration Agency Working Group and access to all IDF materials and working with IDF members in supporting and developing the system. Current registration agencies include CrossRef, Copyright Agency Limited, mEDRA, Nielsen BookData, OPOCE (Office of Publications of the European Union), R. R. Bowker, and TIB (GermanNational Library of Science and Technology). More information on application profile and area of coverage of the agencies can be found at http://www.doi.org/registration_agencies.html.

5. THE CONTENT DATABASE : MAINTAINED BY THE PUBLISHERS

The publisher maintains a database that contains the actual content of the DOI, which was designed to control the distribution of its information. The information maintained on the publisher side may actually be distributed among many databases, but the publisher must be able to present metadata about the actual content to the DOI resolution system in order to communicate the location of the content at the publisher's site. The publishers will take the responsibility of maintaining the content directory over time in that publishers restructure the files, move the files to a new server, or even change the ownership of the content.

When the DOI information is transferred to the publisher, it will look up the DOIs from bibliographic data, citation linking, and find the contents. For subscribed users, the full-text article or downloadable document will appear on the screen; otherwise, information on how to obtain the content or other related data may appear.

6. DOI'S AND METADATA STANDARDS

Metadata are structured information that describes, explains, locates, or otherwise makes it easier to retrieve, use, or manage the characteristics of an information resource. It is a component of data which describes the data or "data about data." The metadata describe the "who, what, when, where, why, and how" about a data set. It provides the essential link between the information creator and the

information user. Each DOI is associated with a series of metadata, a set of bibliographical and commercial information concerning the content (title, author, publication date, copyright, price, etc.).

Answers for a number of basic questions about the identified resource (kernel metadata elements, a minimum level of publicly available structured metadata) should be known by the RA at the time the DOI name is issued and is becoming mandatory for all DOIs that are registered. Some of these data include an identifier associated with the entity from a legacy identification scheme, such as an ISBN (identifier), a name by which the entity is known (title), the primary type of intellectual property (type), the sensory mode such as visual/audio (mode) and primary agent, etc. Therefore, when the publishers register DOIs, they also register kernel metadata that are associated with the DOIs. In order to register these kernel metadata, publishers must locate it within its internal system and they are responsible for maintaining these DOI associated metadata. Digital Object Identifiers and their associated metadata are key ingredients in building an infrastructure to support a cross-publisher database of journal articles and citations based on a distributed production model [4]. In order for the DOI to fulfill its wider potential of providing the basis for a full range of services relating to intellectual property in the network environment, metadata become an essential component of the DOI System as a whole [5].

7. USE OF DOIS IN LIBRARIES

Publishers today are investing in linking technology provided by the CrossRef (one of the DOI Registration Agents (http://www.crossref.org/) to benefit those who search the journal literature using the DOI as an open standard to make citation linking efficient and reliable. Publishers like ScienceDirect, Wiley InterScience, Blackwell Synergy, SpringerLink, and others link their documents via CrossRef. A demonstration of these linking articles can be found at http://www.crossref.org/03libraries/18gallery.html. As the reference-linking network for scholarly and professional publishers, CrossRef linking enables the user to navigate the literature, moving from one article or idea to another across journals and publishers.

CrossRef is a full-scale implementation of the DOI with coverage of mainly scholarly and professional research content, journal articles, books, conference proceedings, etc. According to Amy Brand, CrossRef's director of business development, CrossRef is "a publisher membership association for collaborative technologies, and official DOI registration agency, and a cross-publisher citation-linking network" [6] To date, over 2,300 publishers and societies have participated in CrossRef's collaborative service, enhancing the value of millions of articles from thousands of journals. As of this writing, more than twenty-four million DOIs had been registered in the CrossRef system since its inception in early 2000 with more than 15,000 journals. The best news for the libraries is that CrossRef access is FREE for libraries!

Other benefits for libraries include increasing usage of acquired resources, expanded access to content not owned, and enhanced localized linking. Even though the total number of participating libraries is 1,216 as May 3, 2007, the agency has much work ahead to convince libraries to participate. In the United States alone, there were 9,129 public libraries in the fifty states and the District of Columbia in fiscal year 2001 [7]. According to the National Center for Education Statistics (2005), there were 4,140 colleges and universities in the US in 2003, and about 90 percent of them had their own academic library, or about 3,700 academic libraries. Compared to the total libraries that could be part of this development, the percentage of participating libraries is still small.

On October 30, 2006, CrossRef announced the launch of its freely available Simple-Text Query service to facilitate DOI look-up for researchers and publishers. Libraries would do well to take the advantage of the CrossRef services and provide more efficient linking strategies for their patrons. For example, a library can retrieve DOIs and metadata to make persistent links to full-text works online and use DOIs for online reserves by embedding in reserve URLs. Scott Warren has demonstrated the construction of deep linked e-reserves and provided examples of how such linking could take place

(DOI: 10.1300/J124v22n04_01) [8].

CrossRef publishers support libraries not only by allowing patrons to move seamlessly through the relevant body of research but also by expanding access to content which they do not own, thereby increasing usage of acquired resources and enhancing end-user satisfaction with new levels of service. Libraries that join CrossRef can be part of these exciting developments and add value to their resources. For more information on how to join CrossRef and understand the benefits of membership, visit http://www.crossref.org/03libraries/28benefits.html.

The benefits for libraries include increasing usage of acquired resources; expanded access to content not owned; enhanced localized linking; and DOI and metadata retrieval privileges at no cost.

8. DOIS: BENEFITS AND QUESTIONS

The best feature of DOI is persistence. The DOI interlinking across publisher's content will transport seamlessly, with the content itself, to a local site, enabling users to experience the same richly and contextually interlinked content as if they were on the publisher's site [9]. Perhaps the most immediate and exciting benefit to a publisher of adopting the DOI, though, is that by making the DOI available to end-users, the publisher can effortlessly turn any pre-existing identifier into an persistent, actionable identifier with an efficient, scalable, Internet-based resolution and routing system behind it [10]. This makes easier for the publishers to manage their data/contents and keep tracking the items in their system. By using DOI, even if the content changes hands between publishers and/or vendors, publishers and/or vendors only need to make one change in one place to make sure that all links point to the correct location.

DOI is an open system and anyone can build systems which integrate DOI into local environments. For example, a library can integrate DOI to access its locally licensed materials. As mentioned before, the DOI system is fully managed via registration agencies and can be applied to any form of intellectual property at any level of granularity. The system interoperates with other data from other sources. For the end users, information can be accessed seamlessly cross the Internet.

Some issues related to the DOIs include intellectual property management. Who owns the copyright of the material? How does the system deal with manifestations (the same content in another form, e.g., Word or PDF formats) and version (e.g., edited or translated)? Should different DOIs be assigned for each manifestation and for each version? What metadata standard should be used when assigning DOIs? Even though there are some questions regarding DOI that require further discussion, the DOI has been an extraordinary venture for the publishing industry and their customers and the end users have benefited tremendously from its implementation.

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MOBILE TECHNOLOGY : A VITAL INFORMATION DISSEMINATION TOOLS IN ACADEMIC LIBRARIES

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1. INTRODUCTION

Both library and technology are growing organisms. Dynamic nature of technology has significant impact on every aspect of modern life. Particularly information and communication technologies (ICT) have provided faster access to information and it is also challenging the libraries to rethink and remodel their services adopting the technological changes. In the past few decades, libraries have adopted ICT and passed through developmental stages like automated house-keeping operations, providing faster access to its collection, and digitisation to provide multiple accesses at users desktop. In the modern world, libraries are not lone information providers; Web provides wide range of information although the content may not always be free and/ or with value addition. To benchmark its place as an information provider, libraries must not hesitate to adopt all possible new technologies like ICT, Wi-Fi, mobile communications, and Library 2.0 and 3.0 to redesign, and transform its services so as to deliver information and its services to the more demanding users whenever, wherever and however they prefer.

Mobile technology is changing the way people work and play. Mobile devices are immediate to the user; they provide a channel for information and a way of interacting with others. They are superb at delivering different kinds of resources - streamed video and music, written and spoken literature, travel directions, games, sports scores, photos, and thousands more. Powerful mobile devices are becoming widespread - libraries cannot afford to ignore this medium if they are to keep in step with their patrons. There has never been a more relevant user- driven technology for libraries to adopt.

2. PRESENT SCENARIO OF MOBILE COMMUNICATION

There are wide range of mobile computing platforms in the market from smart phones to multimedia phones with different types, styles, models, and with many inbuilt features and capabilities like cameras, touch screens, bar code scanning, Wi-Fi, Bluetooth, instant messaging, GIS/GPS, RFID, operating systems, varying additional storage space, etc. Revolutionary iPhones and smart phones (3G and 4G phones) can be used to run many software applications including internet access with faster connection speeds. Availability of automatic configuration of GPRS-enabled mobile phones, which help the subscribers to be online with few clicks.

Emerging technologies like speech technology in mobile phones has enabled disabled persons to use mobiles effectively. Dr Ponani Gopalakrishnan, VP, India Software Labs of IBM in an interview with magazine '*Digit*, Jan 2010' talks about the spoken web and they are working on technology that will translate the experience of the web to the mobile phone platform where people can speak and interact with web information through voice.

These smart phones are becoming increasingly ubiquitous to make the dream of 'pervasive library' a

reality. The mobile phones with operating systems, capability to scan barcodes, text recognition may help libraries to interface with other applications to introduce users to online library transactions, database querying, relevant full-text information download and interactive sessions.

3. PREREQUISITES FOR IMPLEMENTING MOBILE-BASED LIBRARY SERVICES

- It is necessary to have a carefully planned requirement study to know the practical situation like, the kind of services to be provided on mobile devices and type of devices to be used.
- Library need to acquire the required hardware and software after market survey.
- Library must provide physical and virtual environment for using mobile devices and accessories.
- One needs to ensure that the customers having mobile phones of different network operators are in a position to avail the services.
- It is a prerequisite to optimise library OPAC, website, and databases for mobile devices and introduce new services wherever possible.
- Security and authentication is a matter of concern in mobile services particularly due to availability of web contents on a 24x7 basis to prevent damage or loss to the data.

4. SKILLS REQUIRED

Librarians should acquire and apply the following skills if they wish to provide mobile-based services:

- Knowledge of hardware and software of mobile devices
- Create/tailor mobile-optimised content including interactive and participative library homepages, OPAC, virtual tours, and databases.
- Familiarity with internet/intranet services like using e-mail, SMS and spam preventing, etc.
- Develop expertise in protecting privacy and security levels as more personalised information is involved in using mobiles for library services
- Skills related to searching and navigating through mobile devices, mobile web applications like push e-mail, etc.
- Skills for interacting with users via smart phone applications, mobile-friendly webpages, and third party intermediary clients.
- Skills relating to training and user orientation to market these services to users

5. MOBILE APPLICATIONS AND LIBRARIES

Libraries have greatly utilized the growth of internet technologies, especially the advancements of web 2.0 applications in its library services. This positive trend has a great implication on libraries and its various services it provide. In the modern e-commerce world most of the works are easily accomplished through the mobile telephone. The emerging Information Service Delivery trends in libraries also tend to follow the same pattern. The users expect the information to be delivered where they are rather than going to the information. This is mainly because of the influence of e-commerce and entertainment services which make use of the internet and mobile revolution to skillfully market their products and service especially targeting their customers who are on the move. Making use of such opportunities created by these commercial services the library and information centers have also started using mobile technology to further their cause. Murray quotes Spires with the observation that "the adaptation of mobile initiatives by libraries and librarians began with medical libraries, as medical professional were among the first user groups to implement an information-on-the-go philosophy into their daily work lives (Murray, 2009). Followed by this there are libraries that have modeled their services to mobile revolution and provide library services on the move in other areas of library labyrinth. While a number of mobile based applications are available for users the Reference Section in the library seems to be the ideal place for mobile based service as it has the potential to transform the face of the library.

Library Website: The adaptation of internet technologies into libraries saw the emergence of library websites which promote the library services through these websites. Any mobile phone which supports internet connectivity can access these library websites and its various services from anywhere. With this dynamic development it is important for the library administrators to provide due consideration for mobile users, who will be accessing the library website through their mobile devices since the viewing area and the downloading speed between the desktop user and mobile user will be vastly different. In modern context most of the libraries provide parallel websites for mobile as well as desktop websites. Though this is a good development it is time consuming for library web-administrators since simultaneous updating becomes mandatory when the updating of the websites is warranted. This is a huge challenge for libraries that's funding and human resources are very limited but at the same time they have the inclination and need for mobile based websites.

Mobile OPAC (MOPAC): Traditionally, the Online Public Access Catalogues (OPACs) served as the binding wine between the user and the library collection. With the advent of mobile services, new Mobile based OPACs are being developed for mobile users in various libraries. Development of mobile optimized OPACs nicely cater for both the regular desktop OPAC users and mobile OPAC users. The biggest challenge in this endeavor is to scale the information display into the mobile optimized output. Sometimes it is very difficult since most of the library catalogues make use of the web 2.0 advancements and use lot of content enrichment and other allied services to their regular catalogues which will be very difficult to scale for the mobile phones. Many of the Integrated Library Services (ILS) has taken up this challenge and already there are some products which provide a good MOPAC service. Millennium ILS provides a catalogue service for mobile users called AirPac (AirPAC) which is a good model for consideration. Notable advancements such as Library Anywhere from LibraryThing (Bowker 2009) and initiatives of SirsiDynix and others in developing specific Mobile OPAC ignites a enchanting mobile catalogue revolution in libraries.

Mobile Collections: Apart from the above mentioned specific services, libraries are also engaged in developing their collections specifically for mobile users. As more and more digital medium come into the library collection a number of libraries are looking ways into market them to the mobile users.

- *Ebooks:* The advent of digital resources saw libraries embarking on Ebooks to strengthen their collection development and optimize its usage. The advent of mobile phones has taken these Ebooks to the next level of readership. While Ebooks can be used by any computer connected to the network, the mobile access to them have transformed these collections to be read and carried anywhere. There are a number of libraries which offer to their mobile users a number of audio books from their collection to be downloaded and used by them. Most of the libraries which give the mobile Ebook service concentrate on providing audio books for their patrons.
- *Journal Databases:* Researches in modern libraries are greatly enhanced with the introduction of Electronic journals which are normally accessed through the desktop web. But the current trend is slowly moving towards providing mobility to these databases which offer some full-text access exclusively for the mobile users. Ebscohost (EBSCO, 2009), LexisNexis (Mintz, 2009) are few notable advancements in this area. These databases provide current and time critical information which a user might need urgently while on the move. Following EBSCOhost, Swets Information Service has also announced that their aggregation of electronic journals will be available soon on mobile. PubMed database is also available through mobile interface.
- *Other Databases:* Apart from these specific resources there are a number of other databases and services which provide a combination of e-book, e-journals, e-reference and a number of other services exclusively for mobile users. BBC Audio books, Xiview, IEEE Explore, Social Science Research Network are some of the notable databases and services which are available through mobile networks. Some support services like MobiLIB provide users with service which link to already existing information providers and act like intermediates and create simplified interfaces to the different services of the libraries such as its OPAC, Directory, library operations etc.

6. LIBRARY & INFORMATION SERVICES ON MOBILE TECHNOLOGY

In view of the capabilities and developments in mobile technologies and their advantages enumerated above, libraries can design and provide the following specific services on mobile devices, compliance with the information security policies and standards of the parent organisation.

SMS/Texting (Alert Services): Existing e-mail alert services like bringing new books to the notice of users for suggestion, intimation of arrival of indented documents by users, informing availability of reserved documents for collection, appraising about which/when books are overdue, library circulars, e-journals subscribed, change in timings, information about important events, etc., can be upgraded by sending through SMS/textalert services3 to meet the information needs of 'netgens'. Such alert notifications can be generated automatically using integrated library management system/software. SMS messages can be sent to group of users simultaneously through many free applications, and intermediary websites/clients.

Formal Education, Distance Learning and E-learning: Students are very versatile in using their mobile phones and various mobile applications. Academic libraries can harness the advantage to lead implementation of library services through mobile devices to support distance learning, formal education, and research activities in e-learning environment by making the information resources ubiquitous. Libraries should redesign their services keeping social networking sites in mind, which are heavily used by younger generation for interaction, communication, and information sharing. Library services should also blend with teaching and research practice of colleges/universities, scientific community or other patrons whom they serve.

Instant Messaging for Reference Services: The reference and referral services have already become virtual with ICT applications and internet. The mobile devices can further appreciate the service with instant answers like definitions, meanings and other information from digital libraries and web. If the organisation has its own secure and private enterprise IM network, libraries may as well make use of these as they are more reliable and secure; or else use web-based free instant messaging services from Google, America Online, Way2SMS, etc., as an intermediary to have interactive sessions with users to answer 'reference queries'. As these free messaging services can be withdrawn anytime by the providers, libraries' may subscribe to fee-based tools like Text a Librarian, LibraryH3lp, MyInfoquest, and Shoutbomb. These tools offer mobile customers all of the benefits of virtual reference services without being tied to a website. Librarians can provide instant answers, and links to articles/references in real time.

E-resources with Mobile Interfaces: Some publishers are already delivering e-books (both text and audio) that are accessible via mobile phones. Using free Plucker e-book viewer, one can access about 20,000 free e-books from Project Gutenberg. Mobipocket of Amazon is one of the stanadard e-book reader applications and the website has over 40,000 titles (about 11,000 free). A large collection of audio books both free-and subscription based services are available for download and also transferable to mobile devices. LibroVox is a collection of free audio books from the public domain. OCLC's NetLibrary collection is providing e-book and audio book titles on library subscription. Libraries can make use of multimedia messaging service (MMS) on mobile devices to share photos, videos, and audio. Most of the e-book publishers provide 24x7 accesses to the library subscriptions from any internet terminal within the campus, as well on mobile devices, such as iPads, Android devices, and Kindle. Just like any other library databases, users are prompted to log in using user-ID and password, when they are off-campus to access e-books on their mobile devices.

One can get today's' news on their mobiles either by accessing the web portals or SMS text messaging on their mobile phones. Newspapers like *Wall Street Journal*, *Washington Post* and *Chicago Tribune* offer news for small screen. In India, NewsHunt, a mobile application by Eterno Infotech Pvt. Ltd. is designed to read newspapers on GPRS-enabled mobile phones.

The greater challenge is to provide access to e-journals through mobile phones as the libraries and publishers prefer authentication limited to campus wide IP address. Libraries must convince the publishers to provide user id and password mode in addition to IP address based authentication to access e-journals on mobiles. Publishers like IEEE Xplore, Elsevier's Science Direct, PubMed, EBSCOhost, Encyclopaedia Britannica, American Institute of Physics iResearch iPhone application, etc., are already offering their databases for mobile devices. The nature.com app from Nature Publishing Group is providing access to read full-text articles, view full-size figures and save references. Libraries can offer their digital collections (institutional repositories and in-house databases) on mobiles phones that can be accessed remotely. Greenstone3 digital library software runs on mobile handsets and allows access just like accessing any other Greenstone server with searching and browsing multimedia collections.

Mobile Optimised Library Webpages: With the increased use of Internet through mobile, libraries are required to redesign their web pages as mobile optimised interactive and participative library web pages to provide dynamic information services to users on a 24X7 basis via mobile devices. While redesigning library must take into consideration the basic models of mobile phones to the smart phones with greater capabilities and functionalities as some of the iPhones and smart phones are compatible to access the web pages designed for larger screens. But the time taken to access is more and downloading is very slow and expensive. To overcome these difficulties, it is necessary to make mobile-friendly websites by using (cascading style sheets) CSS or auto-detect and reformat (ADR) software, which allows a website to rearrange its content and navigation to suit the size of the screen it is being viewed on. Libraries should be aware of mobile web browsers, screen resolutions and size, etc., while creating WebPages. The website must be redesigned to have fewer graphic, so that the page loads much faster and with minimal keyboard operations, to ease the mobile user. In this context, text-only websites are easier and faster to navigate and fabricate into new applications.

Library Instructions and Virtual Tours: Library tours, instruction/induction/orientation programs have been quite significant in bringing the nonusers to libraries and also help the remotely located or users located in different geographical locations. Library users, who don't have time or inclination to attend an on-site workshop, can get access to library tours on their mobile devices. Audio/virtual library tours can be produced fairly quickly, inexpensively, and could reduce the amount of staff time spent helping new users to orient themselves in the library and explaining the facilities available. It can easily be provided both as downloads from the library website and on mobile devices.

Online Library Catalogues on Mobile Phones: Libraries are required to interact with the software vendors to create mobile compatible WebOPACs4. For example, AirPac add-on product will auto detect the type of device you are using and format accordingly the catalogs without graphics for better viewing libSirsi-Dynix, Innovative and Library Anywhere developed by Library Thing have similar options. OCLC's WorldCat 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 phone5. To provide location-based services, libraries have to use mobile telecommunication system, the internet/web-based OPAC on intranet and geographic system like GPS. Many phones have built-in GPS, which allow users to navigate to locations and, if activated, allow others to find them. OCLC's Worldcat mobile application for iphones makes use of this feature when identifying local libraries. Libraries with multiple branches like public libraries can capitalise on the GPS function to create custom maps and navigational tools to branch locations.

QR Codes on Mobiles: QR code stands for 'quick response', and basically a two-dimensional bar codes that can contain any alphanumeric text and often used to store urls, text, etc., known as 'mobile tagging'. QR codes are used in commercial tracking, logistics, inventory control, and advertising. Data can be translated into a QR code by any QR generator, many of which are available as free download. Users simply enter the data to be translated, and the generator produces the code, which can then be displayed electronically or in printed format. Decoding the information can be done with any mobile camera phone that has a QR reader, which is freely available online for most devices.

Libraries can use QR codes to label books, journals, audio/visual, off prints, add QR codes in WebOPAC and other places. Users with phones that have a camera and free barcode decoder software can take a picture of the barcode, then the software decodes the picture, and translates the data into title, barcode, and location information that can be displayed on the phone.

The QR code can be scanned, and saved for further use on mobile. QR codes not only link to websites, but also can be used to send prewritten SMS to phones, transfer phone numbers, and provide further text. They are designed to cope with a high-level of error, hence are suitable for outdoor use.

Mobile-based Library Lending Service: As in banking and financial sectors, libraries can formulate regulations for using mobiles for circulation of reading materials and maintenance of users account. The SirsiDynix Company has developed a handheld circulation tool called 'PocketCirc', which enables libraries to access the unicorn library management system on a PDA device. This wireless solution enables staff to assist patrons in the stacks; checkout materials while off site, such as at community or campus events, and update inventory items while walking around the library. Mobile phones make ILL/document delivery services faster and cut-down the time to request/visit different libraries and complement the geographically remote users.

7. CONCLUSION

The mobile phone has become ubiquitous in today's world and Mobile Technologies and Libraries aims to help librarians and libraries of all types step into the world of mobile interaction by offering practical advice and ideas on how they can make the plunge. It will tell us how to plan, implement, market, and measure the success of a mobile technology plan in our library as well as best practice in information retrieval and dissemination in 21st Century.

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QUEST FOR INFORMATION DISSEMINATION IN 21st CENTURY : SUBJECT GATEWAYS AND WEB PORTALS

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1. INTRODUCTION

In the last few decades, libraries primarily built hierarchical data structures and librarians provided information service without any search engines. In the past ten years, Web business communities have primarily worked on developing fast search engines for information retrieval without paying much attention to data structure. Now with the exponential growth of data on the web, it is time that librarians and computer engineers work together to improve both search mechanisms and data structures for a more effective and efficient information service.

Information technology has made many advances over the years, with the most rapid ones coming recently from Gothenburg's printing press to e-publishing. One might think that technology is making it easier for us to organize and store information, has made access and retrieval easier; however, it is not a straightforward case. Advancing technology has created a whole new problem – information boom. Technological advances have made it easier and faster to analyze, collect, abstract, index, search, and use data and information. But the information may be scattered, not only in several different databases, but also on completely different systems, some, of which users may not be able to access. If information professionals find it difficult, then for users it is nearly impossible. So to arrest this titanic problem, the concepts of "Web Portals" and "Subject Gateways" have emerged. The web portals and subject gateways engaged in response to the challenges of "resource discovery" in a fast developing Internet environment from the mid 1990's to this 21st Century.

2. SUBJECT GATEWAYS

Subject gateways are primarily information gateways, or subject directories. These gateways are portals to web pages and online resources in a particular subject area. They may link to documents, databases, sites, or news items, and often provide some sort of online forum for information exchange. Subject gateways may have a search interface so that you can find what you want, or they may simply be a browseable index of resources.

Instead of using a general search engine, using a subject gateway can result in returning of more relevant web pages from the search as they usually link to reliable web pages. While, using a search engine, users need to carefully go for an appraisal process about the information retrieved from the web before relying on it as a basis for further study or research. As such high quality/ recommended resources are being marked in such portals or gateways.

A formal definition of the Subject Gateways, as given by the Australian Subject Gateways Forum, is "Web based mechanism for accessing a collection of high quality, evaluated resources identified to support research in a particular subject discipline". It is a service, which is accessed via a portal, through open standard protocols which allow it to slot in seamlessly behind the scenes. What the end-

user sees is web-based, behind the scenes *is* more structured service.

3. NEED OF SUBJECT GATEWAYS

With large amounts of information available on the Internet, users are finding it more and more difficult to access the desired information. Several tools are being designed to help users overcome the problem of 'finding requisite bit of information'. Subject gateways are one such tool designed for a specific user group with interests in a specific subject area. Subject gateways are gaining popularity, as their design arises from the combined efforts of the subject specialists who give their expert advice on subject details.

As indicated above, that the growing number of digital repositories that are available on the Web, is rendering it difficult for the users to track individual sites in search of necessary information. Many organizational repositories have not been indexed by the search engines due to various factors. As such, requisite mechanism by which the inter-repository resources can be traced and surfed to the top has been the need of the hour. A mechanism needs to be developed by which the repositories can share the resources and work in coordination, to provide a wider domain pursuit to the users. The mechanism which provides the ability to the information systems to work in coordination has been termed as interoperability. Open Archives Initiative (OAI) is one of the landmark efforts to ensure the availability of the metadata of digital resources of many repositories at the users' end.

4. SUBJECT GATEWAYS IN THE PRESENT STUDY

In the present study, the development of subject gateways or portals is to create such portals by harvesting quality information rich digital repositories created and maintained by various organizations/agencies. These repositories are based on standard practices and using well known standards that facilitate interoperability and thus can allow harvesting of data from across the repositories and provide a one-stop shop for information access to resources that are relevant for information requirements. These digital repositories, generally institutional in character, are not merely the bibliographical type repositories, but substantial portion of such repositories contain full-text documents with passable search features. The resources contained in these repositories are open access resources, and by and large the access to full text is open and free.

However, creating subject portals in this case would need setting up of a Harvester service that is OAI-PMH compliant, so that the metadata can be harvested which provides a conduit to reach the identified relevant documents. But before we actually touch upon the aspect of generating subject portals, it becomes imperative at this point of time to throw some light on critical factors for success of sustenance and execution of gateways.

Subject gateways were conceived and carried forward as a part of academic and carried forward as a part of academic and research information infrastructure initiatives most of which have been developed in Europe. Ways and means have constantly been thought of for the development of subject gateways at the international level. Some of the popularly used subject gateways are:

AERADE: AERADE Launched in November 1999. AERADE was an initiative developed by Cranfield University to enable aerospace and defence experts to find quality, relevant information on the Internet. The service is a joint venture between subject specialists within the information and library services at Cranfield campus (aerospace) and Shrivenham campus (Defence). It provides integrated access to a collection of over 4,000 quality assessed resources that have been created worldwide in aerospace and defence resources. The resources are selected, evaluated, regularly monitored and updated by subject specialists from Cranfield University, and the team has produced a Statement of Quality for all assessment and procedural.

(Source: http://aerade.cranfield.ac.uk/)

BUBL Information Service: The BUBL stands for "Bulletin Board for Libraries" originated in 1990 (http://bubl.ac.uk/ provides two major services for the UK higher education community: a directory of selected internet resources covering all subjects of academic relevance (the BUBL LINK service), and the tables of contents, abstracts, or full text of hundreds of academic journals and magazines (the BUBL Journals service). BUBL includes an alphabetical list of subject resources and links to over 12,000 internet resources including e-journals and mailing lists covering all subject areas of arts, humanities, media and social sciences with a special focus on library and information science.

As a collaborative effort of UK institutions and individual librarians, it provides the best single collection and the first address in our subject area. It uses the Dewey Decimal Classification System as the primary organization structure for its catalogue of internet resources. Initially designed as a resource for librarians, it includes a directory of UK organizations and institutions, job postings, user group links, surveys and comprehensive archives. BUBL provides links to current editions of all major UK newspapers, as well as abstracts and selected full text from over 200 journals.


(Source: https://www.strath.ac.uk/cdlr/services/bubl/)

Biz/ed: Biz/ed is a free online service for students, teachers and lecturers of business, economics, accounting, leisure and recreation and travel and tourism. Since its launch in January 1996, Biz/ed has established itself as the primary provider of Internet-based learning materials for the economics and business education community.

Biz/ed is targeted at students and teachers in the post-16 education sector, covering schools, FE colleges, universities and beyond. The site offers support for economics, business, accounting, leisure and recreation and travel and tourism at many different levels including AVCE, AS and A2 level, International Baccalaureate, HNC, HND and MBA. The Biz/ed site is a unique combination of primary and secondary teaching and learning resources. Resource discovery is integrated with simulations, worksheets, glossaries, spreadsheets, resource databases, online chat with examiners and a series of Virtual Worlds to give a rich package of support for teachers, lecturers and students.

The site reflects the ever-changing business world with a high degree of topicality and currency. These include current affairs articles written to directly support the curriculum, weekly newsletters, case studies and features looking at the economics and business arguments behind various news stories. These materials underpin economic and business theory in ways that are practical, informative and iterative. The breadth of resources offers economics and business educators a wide range of options for the integration of Web-based materials into their learning and teaching programmes. The service also offers a range of workshops for FE and HE users.


(Source: http://www.bized.co.uk/)
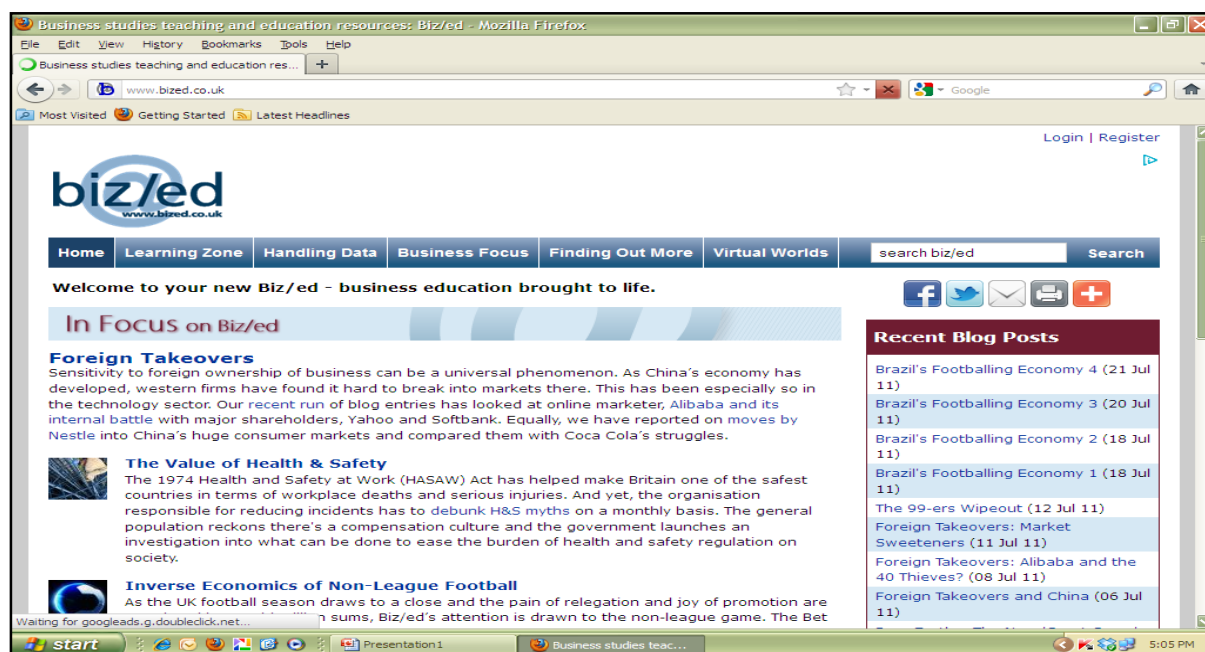
Eldis: Eldis is an online information service providing free access to relevant, up-to-date and diverse research on international development issues. Eldis includes over 30,000 summaries and links to free full-text research and policy documents from over 8,000 publishers. Each document is editorially selected by members of its team members. It communicates this knowledge effectively through a range of appropriately designed services, using the Internet (web and email) as the main communication medium for delivery.

Eldis is hosted by IDS but our service is delivered by a growing global network of organizations including IID in Bangladesh, CSDMS in India, Soul Beat Africa, and the National Library Service in Malawi.

This website is predominantly used by development practitioners, decision makers and researchers. Over half a million users visit the site every year and more than 50% of its regular visitors are based in developing countries. But Eldis is not just a website. All of its contents are Open Licensed so that it can be re-used by anyone that needs it. Website managers, applications developers and Open Data enthusiasts can all re-use Eldis content to enhance their own services or develop new tools. See our Get the Data page for more information.
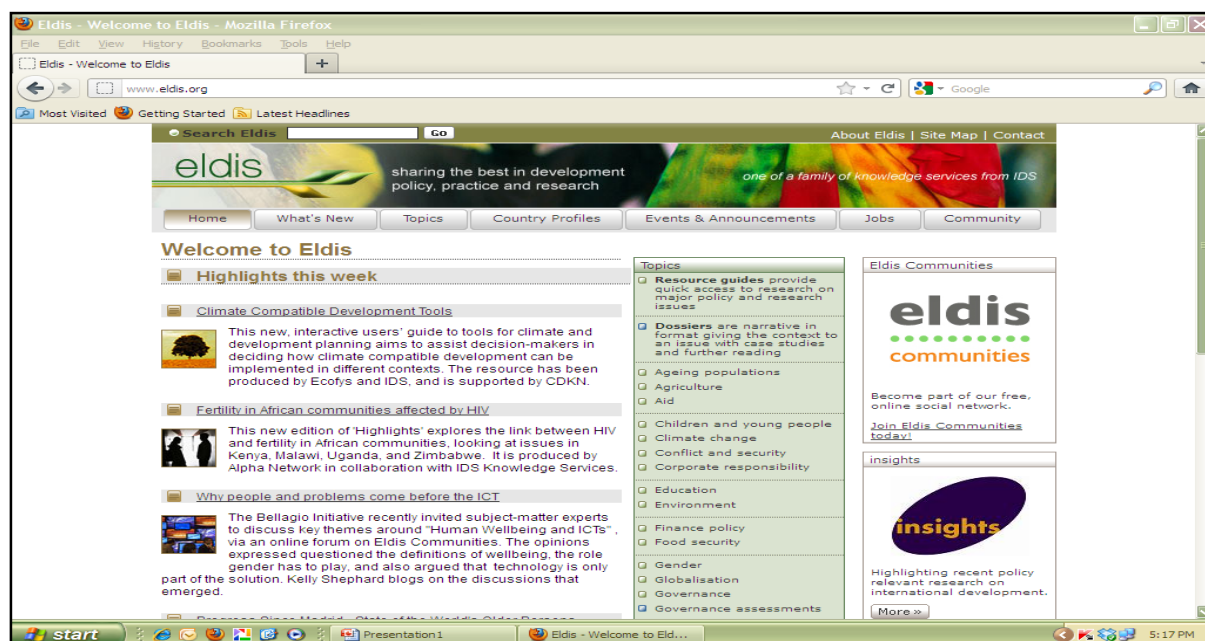
(Source: http:// www.eldis.org/)

Digital Librarian: A Librarians' Choice of the Best of the Web: Digital Librarian is an annotated index of general internet resources that is extremely comprehensive. This subject gateway offers a wide range of links, including dictionaries, autobiographies, state and federal documents, libraries and museums, books, articles and speeches with brief annotations that introduce most of the links. The listings are arranged alphabetically and are good to browse through this site.

(Source: http://www.digital-librarian.com/)
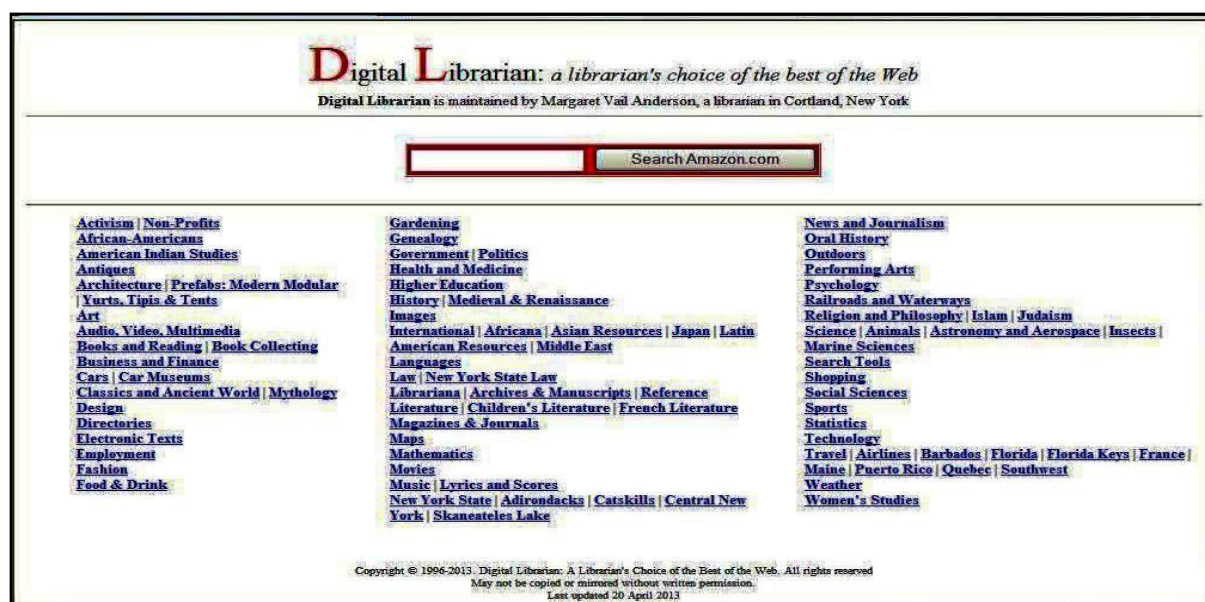
WWW: Virtual Library: The WWW Virtual Library (VL) is the oldest catalogue of the Web, started by Tim Berners-Lee, the creator of HTML and of the Web itself, in 1991 at CERN in Geneva. Unlike commercial catalogues, it is run by a loose confederation of volunteers, who compile pages of key links for particular areas in which they are expert; even though it isn't the biggest index of the Web, the VL pages are widely recognized as being amongst the highest-quality guides to particular sections of the Web. Each entry within a subject area links to the appropriate internet resource and is accompanied by a brief description and a relevancy ranking.

(Source: http://www.vlib.org.uk/)
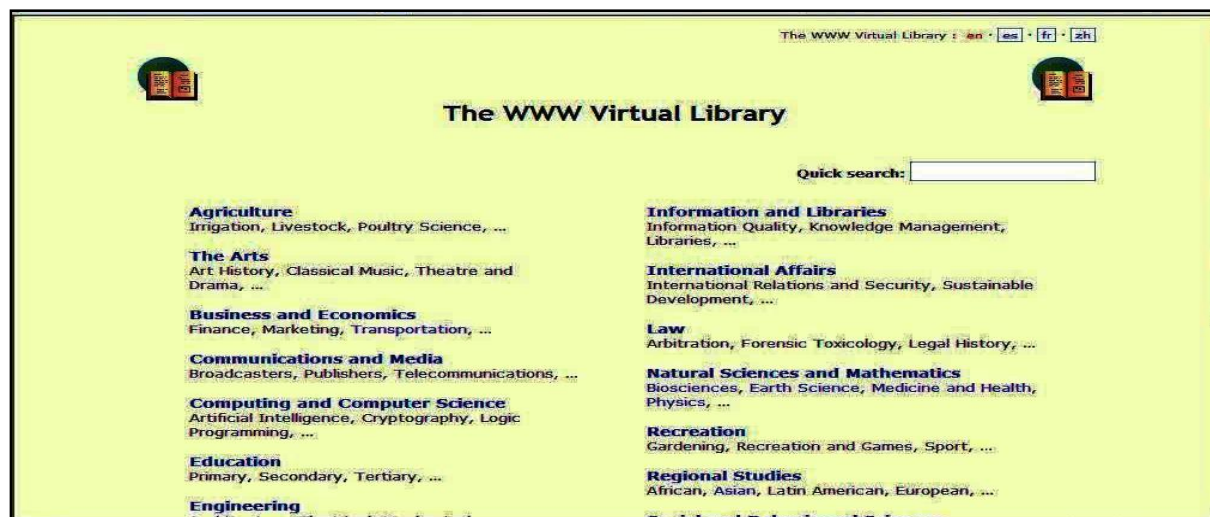
LISGateway: LISGateway is a repository of information related to library sciences and online journal publishing systems provides searchable and browsable catalogue of Internet based resources related to Library & Information Science including educational institutions, e-journals, opac's, library associations, etc. The data pages establish links mainly to sites, which have produced e-journals, e-books, reference resources, etc. rather than to evaluate, filter and organize the resources themselves. It encourages the exploitation of publishers' material by providing free access to quality web resources.

(Source: http://www.lisgateway.com/)
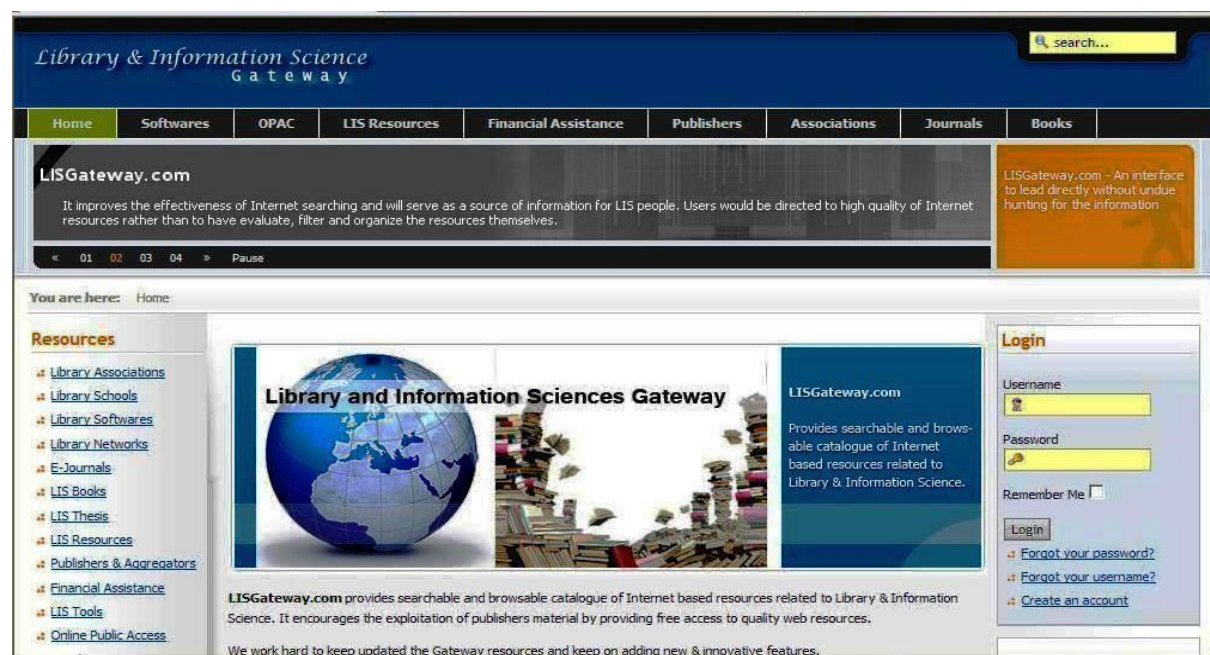
Portals: The "portal" is an entry point to a world of resources, designed to save the users' time, to unite him or her with relevant resources, and to encourage maximum use of acquired resources. It may be customized to personal or role interests. Portals were initially developed by large companies to provide a single user interface for employees to access corporate information. A portal can mounted either on a dedicated server or on a web server that supports other applications. It provides an easy-to-navigate interface, can be personalized using users' profile information to deliver personalized content, can be used to provide chat, e-mail, shared calendars, web meetings, etc.

The JISC Portals FAQ defines a portal as: Technically, a portal is a network service that brings together content from diverse distributed resources using technologies such as cross-searching, harvesting, and alerting, and collates this into an amalgamated form for presentation to the user. This presentation is usually via a web browser, though other means are also possible. For users, a portal is a possibly personalized, common point of access where searching can be carried out across one or more than one resource and the amalgamated results viewed. Information may also be presented via other means, for example, alerting services and conference listings or links to e-prints and learning materials.

The Importance of Library Portals: Librarians have become increasingly aware that the multiplication of electronic resources is a problem for end-users. Users find it difficult to find the most appropriate database or resource to search for information relevant to their need. Even if they locate the right resources, since each service tends to have its own unique interface, they may struggle to search it effectively. A further obstacle to access is the need to remember and enter many different passwords to access the different databases. These problems may lie behind a perceived lack of use of library subscribed to electronic services. Librarians also need tools to manage a resource through its whole history from acquisition to presentation to users to evaluation for renewal or withdrawal. Tools exist within LMS to do this for books and journals.

In response to this need a number of suppliers of LMS systems and library products have developed sophisticated library orientated portal products. Nearly all the major systems suppliers have now entered the market, with epixtech and Talis amongst the most recent. It is this range of technology solutions that are discussed in the report. It should be said that the fragmentation of information resources and variations in internal layout of information has always been a problem, as anyone who has had to explain where the quarto books are in the library will be well aware. Library portal technology offers a potential solution to ameliorate this long-term problem, when combined with appropriate user training and culture change.

As portals are considered primary means for transacting information, libraries of all types are becoming involved in thinking, planning and building various frameworks and services. A library portal brings together content from diverse resources, including the library catalogues, online subscription reference materials, e-journals and e-learning teaching materials. It offers a gateway to a range of high quality sources through a single interface like the library website or a commercially produced package. The ideal library portal has a comprehensive coverage, provides access to the catalogs of libraries and providing options for filtering search results to increase the relevancy of the information retrieved. Libraries across the world are reaping the benefits of such portals to the maximum. There are hundreds of portals for the librarians, online searchers, information brokers, knowledge managers, etc. Some of the popularly used web portals are:

Infolibrarian: Infolibrarian is a portal deals with the identification of quality resources and assist Researchers and LIS professionals alike in the best use of these resources with the help of web tools and tutorials for effective retrieval of right information at a right time from a right source. The objective behind this web portal is to give maximum information to library and information science professionals, and researchers at one place.

Infolibrarian embarked on its journey to provide useful information to Library and Information

Science [LIS] professionals in 2000. Soon, within a span of a year or so, it received good response from fellow LIS professionals. The site also made it to the list of useful resources of United Nations, UNESCO, Subject Directories etc. Today, we realize the name 'infolibrarian' has become omnipresent among the professional circles in India and abroad. We very much appreciate and sincerely thank you for your patronage extended to us and we hope you will continue to support us in meeting our goals.


(Source: http://www.infolibrarian.com)
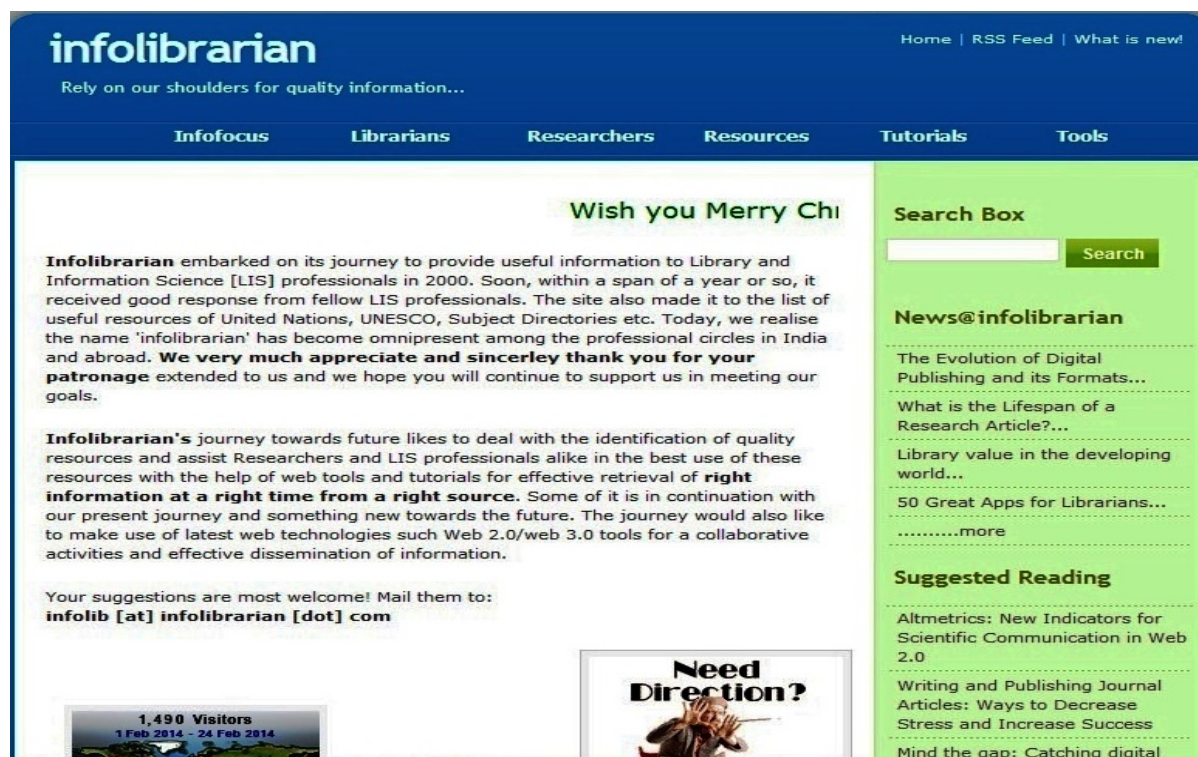
Internet Public Library2: Internet Public Library began in a graduate seminar in the school of Information and Library Studies at the University of Michigan in 1995 with the objectives to ask questions about the interconnections of libraries, librarians and librarianship with a distributed networked environment and to learn about these issues by actually designing and building the Internet Public Library. It is a global information community that provides in-service learning and volunteer opportunities for library and information science professionals and students, offers a collaborative research forum and supports and enhances library services through the provision of authoritative collections, information assistance and information instruction for the public.

It provides library services to internet users including finding, evaluating, selecting, organizing, describing and creating information resources and also directs assistance to individuals. It develops technology and best practices for providing library services through the internet, including digital reference service and collection management. It seeks to challenge and redefine the roles and significance of libraries in an increasingly distributed and digital world.

In January 2010, the website "ipl2: information you can trust" was launched, merging the collections of resources from the Internet Public Library (IPL) and the Librarians' Internet Index (LII) websites. ipl2 is a public service organization and a learning/teaching environment. To date, thousands of students and volunteer library and information science professionals have been involved in answering reference questions for our Ask an ipl2 Librarian service and in designing, building, creating and maintaining the ipl2's collections. It is through the efforts of these students and volunteers that the ipl2 continues to thrive to this day.

(Source: http://www.ipl.org)
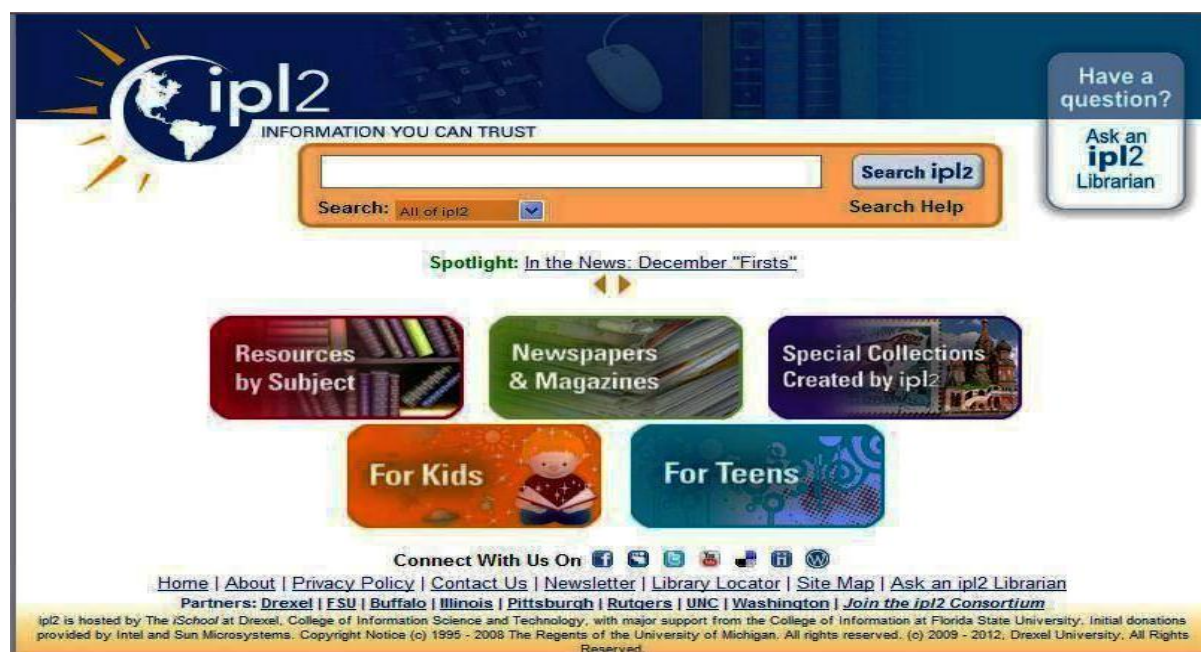
Internet Library for Librarians: Internet Library for Librarians has been a popular information resource site for librarians since 1994 and is linked and referenced by hundreds of libraries and other organizations including the Library of Congress and OCLC. It is an information portal specifically designed for librarians to locate Internet resources related to their profession. It is a comprehensive web database designed to locate internet resources and covers links to more than 4000 Internet resources that have been recommended, selected and reviewed by librarians. These resources provide over all description of the observable and measurable end result and scope of the resource as well as contact information. Its detailed hierarchical classification provides quick access to the most specific branches of library practice. It is also a reference portal, with a good set of links to ready reference sites and is updated monthly. It is a handy and useful tool for both fresher and experienced library staffs.

(Source: http://www.itcompany.com/inforetriever/index.html)

Librarians and Archivists form Library of Congress: This web portals links to a general collection about school library resources, online catalogues, digital libraries, professional organizations, library and information science schools, professional journals, library vendors and library conferences which are interest to students engaged in their professional library or archival training. Archival repositories such as the Library of Congress routinely create detailed inventories, registers, indexes, and guides to describe their collections of primary source materials. These *finding aids* provide a comprehensive overview of a collection's scope and contents. They define the conditions under which a collection may be accessed or copied, explain its provenance, and contain histories of individuals and organizations connected with the collection. Descriptions of Library of Congress archival collections can also be searched in the Library of Congress Online Catalog. Many Library of Congress archival collections are described by print finding aids available only in individual **reading rooms**.

(Source: http://www.loc.gov/library)
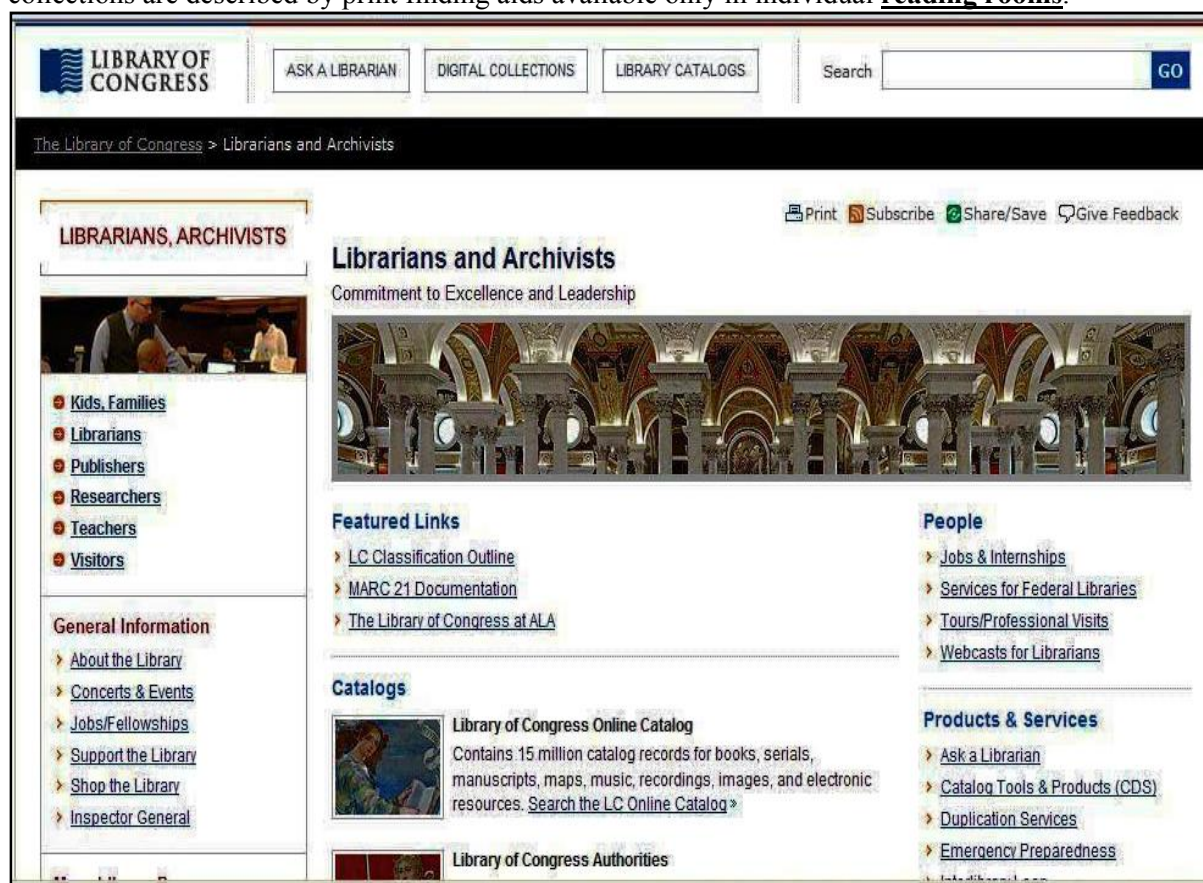
LibrarySpot: *LibrarySpot* is a web resource with useful content for practically anyone looking for information found in libraries. It is a unique web portal having a series of vertical portals developed by Start Spot Mediaworks. It is a free virtual library resource center for educators and students, librarians and their patrons for valuable research information available on the web. It brings the best library and reference sites together in one user-friendly spot.

LibrarySpot covers both library topics and general reference sites together in one user-friendly spot. It covers both library topics and general reference including cooking, government, employment, shopping and travel. Each has links to principal websites in its respective topic and some feature material. As a library portal, it covers all the main topics and is strong in links to libraries by type, and week in library practice. It is easy to use with intuitive browsing and annotated entries, but is not searchable.

(Source: http://www.libraryspot.com)

UNESCO Libraries Portal: It is an international gateway to information for librarians and library users dealing with online resources. It provides more than 16,000 links to websites of libraries and archives worldwide and resources related to librarianship. This portal was launched in 2001 in order to provide service to concerned professional communities worldwide. Information covers news, education, list of official associations and networks and general library issues including collection management, cooperation, preservation, etc.

In the current IT environment, the libraries that deal with information overload benefit tremendously from the portals as these customize the information content to meet specific end-users needs and achieve order out of chaos, ultimately leading to better information management. Academic and special libraries in particular have found the portals as they struggle to complete with a host of other information providers and services. A library which maintains links to local and remote information resources makes such portals available to students and faculty for their information needs, thereby making the library and its services more effective, productive and responsive to client needs.

(Source: http://www.unesco-ci.org/cgi-bin/portals/libraries/page.cgi?d=1)
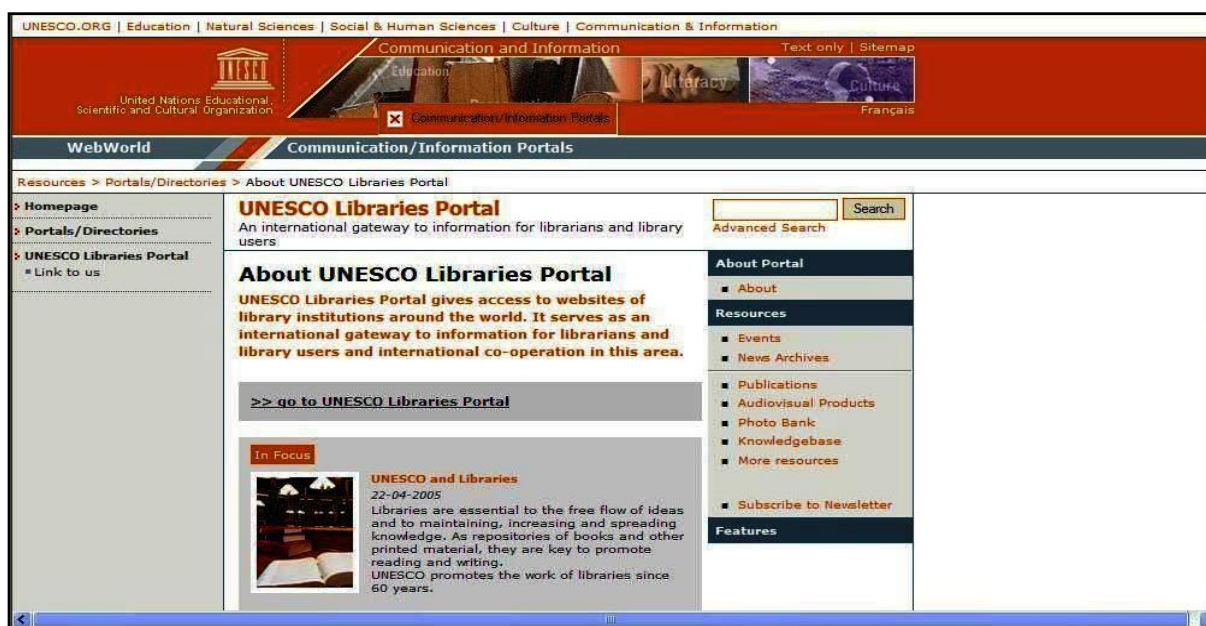
5. CONCLUSION

The whole Internet is moving towards vertical Web sites. The Internet is so big, so wide ranging, and it's growing exponentially. No horizontal Web site can keep up; therefore, you have to go vertical. It's like a great library. Libraries have subject areas, and that's exactly how the Internet is breaking out. Library subject areas refer to library subject classification systems for information storage. While libraries strive hard to become more like business Web portals, Internet business communities also attempt to become more like libraries by organizing huge amounts of information into hierarchical structures. Portals and gateways are proliferating. They should be one main way into institutional information resources, but it must also be capable of offering web services to other knowledge resources; just as they themselves will increasingly seamlessly integrate content and functions from other third party systems.

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[14] https://www.strath.ac.uk/cdlr/services/bubl

[15] http://www.bized.co.uk

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MULTIMEDIA LIBRARIES
IN ELECTRONIC ENVIRONMENT

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1. INTRODUCTION

The dawn of computers has completely changed the information environment. The ever-increasing use of a multiplicity of formats to create, gather and store information has had a major impact on the range of materials found in libraries. The advent of computer has not only revolutionized the existing printing technology but has brought into practice electronic media like disks (CD-ROMs, DVD-ROMs), tapes, slides, games, microfilms, microfiches, motion picture films etc. The traditional libraries maintain the conventional media like books, audio-video films, microfilms and gramophone records etc. Libraries and information centre now can store a large amount of data/information in electronic media and retrieve the same in seconds and satisfied their customers. Conventional media document has also occupied the large space, now this problem is solved by the multimedia technology products, which store the large amount of data/i9nformation in minimum space. Now the CD-ROMs has also going to be replaced by the DVD-ROMs, which can store the double fourth time data/information in compare to CD-ROMs by using the compression technology.

Libraries, particularly those in India, have not been immune to such developments. Of particular note has been the growth of non-print materials to support educational, informational and recreational needs. Non-print or audiovisual materials are found in every type of library that exists in India. The development of multimedia collections in libraries is tied directly to the technological revolution that began in the 19th century and which has steadily gained momentum over the years.[1]

2. WHAT IS MULTIMEDIA?

Any computer-delivered electronic system that allows the user to control, combine, and manipulate different types of media, such as text, sound, video, computer graphics, and animation. Interactive multimedia integrates computer, memory storage, digital (binary) data, telephone, television, and other information technologies. Their most common applications include training programs, video games, electronic encyclopedias, and travel guides. Interactive multimedia shift the user's role from observer to participant and are considered the next generation of electronic information systems.

"Multimedia means digitizing information from a number of sources, text, sound, picture, video, music and recording it on a computer system where it can be manipulated and recombined"[1]

"Multimedia information result from the integration of data, text, images and sound within a single electronic information environment"[2]

Tony Fieldman explain the term Multimedia as "the seamless integration of data, text, images and sound within a single digital information using computer systems which are user friendly and, above all, integration."[3]

Encyclopedia of Microcomputer defines multimedia as "multimedia information systems are those application systems that use two or more type of data from sound audio, video, graphics, images and alphanumeric data. It is a technology platform that harnesses the best among contributing technology".[4]

Multimedia is the integration of audio, video, text and graphics within an electronic interface.

3. MULTIMEDIA LIBRARY

Multimedia library is one in which a full range of print and audiovisual media, necessary equipment, and service from media specialists are accessible to users .Multimedia library may be designed to accommodate

- Printed material,
- Audio visual material,
- Materials production,
- Television, and
- Electronic data of computer processing.

Multimedia Library can organize all entire collection of audio and video files into a library of Artists and Albums. Multimedia Library can store all kinds of information about created artists, albums and files entries. Librarian can keep artist pictures, biography, discography, lyrics and much other information. In addition to organizing all files can also store them in the database file as well.

- Photo Albums lets you create albums of your digital pictures. You can organize pictures into albums with categories, view and edit pictures. In addition to organizing pictures you can store them in the database file too.
- CD Catalog library lets you create a database of all your CD audio discs. You can scan your discs and store all tracks information, lyrics, CD properties, front cover, back cover and CD picture. To scan your CDs you can also query the CD database Internet database for track names and album information. In addition album's front cover image can be downloaded from Internet as well.
- Playlists Database is a library where you can store your playlists files.
- Integration of print and non-print resources is more beneficial to the users. In other words multimedia library is a collection of information in a variety of forms like printed books, microfilms, microfiche, electronic books, videotapes, compact discs, CD-ROM, DVD-ROM and other computer hardware and software accessories. Collection, storage, organization, processing and dissemination of information are a regular and continuous process in libraries. Multimedia libraries being technologically up to date may prove most effective institutions for storage, retrieval and dissemination of information, especially in modern networked environment.

Following hardware and software requirements of Multimedia Library:
- PC-386 processor of at least 4MB RAM (8 MB is preferable)
- Digital Audio System, Audio Amplifier/ Speaker/Headphone
- CD drives to play CD-ROM. The faster the CD drive, the better   will be the performance of CD-ROM
- VAG graphics, VHS-VCR controller card of 16 bit preferable
- Hard disc with at least 120 MB capacity
- Means of user interactive devices such as remote control device,   mouse, joystick, keyboard, monitor etc.
- Software (Windows, Link way, Author ware, Professional,   Micro Mini-card etc.

4. NEED OF MULTIMEDIA LIBRARIES

Conventional information sources occupy a large space in the library. The life of these documents hardly cover few decades and turns unusable, Users also feel difficulty in searching relevant information from such sources. Computerized information retrieval systems on the other hand can

yield better results with comprehensive coverage.

Regardless of whether the information is in printed media of electronic media, libraries store and maintains all kinds of information space is always the key problem to store the conventional form of information. Much storage space is required to make traditional sources usable to the readers. This problem is solved through multimedia products which store vast amount of data/information in different media. With the advancement of technology, information storage and retrieval showed a trend forwards a paperless society. Libraries need to adopt digital. Optical, audio, video systems for storing and disseminating recorded information such as text, voice, graphics and images in place of conventional books, journals, monographs, charts, tables, maps, etc.

5. FUNCTIONS OF MULTIMEDIA LIBRARIES

Widens the Horizon of Information: The present day society strives for production, collection, processing, storing and dissemination of right information to right person at right time, information being a strategic resource affects activities of mankind. Multimedia library because of its superior technology can make information available to end user in an effective form. Developed countries are developing multimedia libraries to reap the benefits of new technology to expand their sphere of information horizon.

Educational Activities: Multimedia library may act as an institution for spread of adult education and also provide for continuous lifelong education. Such type of libraries are able to update latest knowledge while working on world wide web (www) and thus help in creating and sustaining broad academic interests, creativity, research and independent intellectual activity.

Inter-Cultural Understanding: Multimedia library when browsed on internet beyond fore walls of the traditional libraries may function as quick fix agents of cultural exchange, thereby helping people to understand different cultures and so improve quality of life, broaden aesthetic interest and artistic appreciations of various cultures.

Recreational Activities: The multimedia library serves to provide for a wide range of recreational interest to enhance a balanced and meaningful life.

6. USES OF MULTIMEDIA LIBRARIES

Ease in Maintenance and Management: A single optical disc (OD) can accommodate hundreds of printed documents. Multimedia library in electronic form can accommodate lacks of books on a few ODs thereby facilitating ease of maintenance and management. Though multimedia system require expertise, but if helps in reducing lit of human efforts, time and money spent on care, repair and arrangement of books and catalogue etc.

Durable And Dependable Media: Information recorded on optical discs is more durable than printed books as the paper is vulnerable to dust, mist and fire. As against this ODs having life even beyond 100 years are pouring in the market, which are less vulnerable to fire, flood and other calamities.

Information Retrieval: Information stored on Optical Discs (ODs) can be easily and quickly retrieved by multimedia techniques than traditional manual technique such as cataloguing and classification will be negligible in multimedia libraries.

Fulfills Information Requirements: Traditional libraries operating within fore walls of specified buildings cannot fulfill ever growing requirements of present day users because of financial and other constraints. Use of multimedia, networking, ODs and other information technologies are essential for meeting ever growing requirements of users to get latest information. It is, therefore, essential to promote multimedia libraries.

Solves Space Problem: Multimedia shall solve the problem of Libraries as for as paucity of working

space in libraries is concerned. In fact the requirement of space in a multimedia library will be reduced several hundred times.

Growth in Resource Sharing/Networking: Resource sharing/Networking are some of the most striking features of multimedia libraries, as with the help of these techniques information desired by end users from any corner of the world can be down loaded.

Effective Presentation of Information: Multimedia computer creates three dimensional (3-D) effects of an object in a variety of ways, so effective presentation of information gives advantage to multimedia library users.

7. ADVANTAGES OF MULTIMEDIA LIBRARIES

The traditional libraries are limited by storage space; multimedia libraries have the potential to store much more information, simply because digital information requires very little physical space to contain them. As such, the cost of maintaining a multimedia 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. Multimedia libraries do away with these fees.

Multimedia libraries can immediately adopt innovations in technology providing users with improvements in electronic and audio book technology as well as presenting new forms of communication such as wikis and blogs.

- **No physical boundary:** The user of a multimedia library need not go to the library physically; people from all over the world can gain access to the same information, as long as an Internet connection is available.
- **Round the clock availability:** A major advantage of multimedia libraries is that people from all over the world can gain access to the information at any time, as long as an Internet connection is available.
- **Multiple accesses:** The same resources can be used at the same time by a number of users.
- **Structured approach:** Multimedia library provides access to much richer content in a more structured manner, i.e. we can easily move from the catalog to the particular book then to a particular chapter and so on.
- **Information retrieval:** The user is able to use any search term bellowing to the word or phrase of the entire collection. Multimedia library can provide very user friendly interfaces, giving click able access to its resources.
- **Preservation and conservation:** An exact copy of the original can be made any number of times without any degradation in quality.
- **Space:** Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain them. When the library had no space for extension digitization is the only solution.
- **Networking**: A particular multimedia library can provide the link to any other resources of other digital library very easily thus a seamlessly integrated resource sharing can be achieved.
- **Cost:** In theory, the cost of maintaining a multimedia library is lower than that of a traditional library. A traditional library must spend large sums of money paying for staff, book maintains, rent, and additional books. Although multimedia libraries do away with these fees, it has since been found that digital libraries can be no less expensive in their own way to operate. Multimedia libraries can and do incur large costs for the conversion of **print** materials into digital format, for the technical skills of staff to maintain them, and for the costs of maintaining online access (i.e. servers, bandwidth costs, etc.). Also, the information in a digital library must often be "migrated" every few years to the latest digital media. This process can incur very large costs in **hardware** and skilled personnel.

8. MULTIMEDIA LIMITATIONS

- The drawback of this process, of course, is the issue of technological obsolescence. If reformatting relies on technology that becomes obsolete, the preservation effort is seriously compromised. The task of reformatting all materials that used acidic paper, nitrate films, or other degradable materials is monumental, generally requiring cooperation between many libraries and a substantial infusion of government funds.
- The requisite Hardware and Software to set up multimedia is still very expensive and require large investment.
- A specific program/ Software are not available to central coordinate the different media in multimedia.
- Lack of trained staff for management of the multimedia.
- There is no unique standard among the various platform and between hardware and software.
- All the users cannot be expected to have the same level of intelligence so there should be proper guidance and supervision for proper use of the multimedia.
- Lack of search and pattern recognition capability for locating the information.
- Problem of presentation of digital material.
- Variety of sizes, shape etc. create problem to maintain the different sizes documents in single collection, as CD, Floppy, Cartridge tape cannot be kept together.
- Resource sharing only possible in networked Library.
- Intellectual Property Rights and copyright, patent license agreement etc. will have hardly any meaning and piracy will load to non standard, unauthentic versions flooded in the market. This definitely effect the reliability of the information and information providing agency
- Virus, power failure, system down, software incompetence etc. are also the limitations of multimedia system.

9. SUGGESTIONS

- To overcome the preservation problem libraries should developed several preservation strategies. The most important method of preserving library materials has been reformatting. Brittle and crumbling books and photographs are preserved by photographing them on microfilm or, in some cases, by using scanners to create digital images on magnetic or optical disc. These less vulnerable formats can then be preserved in archives. Reformatting also enables the inclusion of library materials in other media, such as multimedia information services.
- Only authentic and licensed version of the software/programs should be purchase.
- There should be a ban on using the external floppies etc., they can be virus effected and can make the system damage.
- Everyday should be take backup of the work and should keep in cover with security.
- There should be security of database only searching and printing facilities should be given to the user.
- Time to time should be change the password of network access system and database; system should be equipped with powerful antivirus software.
- Library should be continuously watch on user's activities and prevent them to make pirated copy of the programs etc.
- There should be a provision of proper training for users as well for the staff to use multimedia resources, services etc.

10. CONCLUSION

Multimedia technology is suitable and sustainable technology which can be broadly used for better and integrated demonstration of textual, graphical, audio, video information activities so the end user which certainly has immediate and indelible effects. Now in the digital age, multimedia data such as video, audio and images are rapidly becoming run–of-the mill and will soon replace the conventional

data. For handling the new multimedia material, new techniques are required to access, manage and for searching

In the age of Information Technology the user is demanding to access a variety of multimedia information services due to its simple and time saving use. However, in India the use of latest technology such as multimedia, CD-ROM, DVD etc. are limited as compare to advanced country.

Now most of Libraries feel that multimedia should be integrated into the services of the Library. Most of the Libraries in India are using multimedia resources in their reference services and operation in user education program. Multimedia now became most popular

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INSTITUTIONAL REPOSITORY : PROSPECT AND ITS GLOBAL IMPACT

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1. INTRODUCTION

With the process of globalization in knowledge activities, the demand for information has been growing steadily in all spheres of work. The concept of access to information free of charge in electronic format is gaining momentum. Creating Institutional Repository is a step in this direction. Institutional Repository (IR) is a very powerful idea that can serve as an engine of change for any institution.

An institutional repository is the collection of intellectual output of an institution, academic community etc. in formal or informal form such as research papers, conference papers, workshop notes, books, book chapters, patents, lectures, presentations, theses, dissertations, performance reports, project reports etc. preserved for wider accessibility to the academic and scientific community and for generations to come. Libraries, librarians and institutional bonafide members have an important role to play in the collection development. The benefit of institutional repositories is that they enable free sharing of information, encouraging collaboration and the widespread communication of institutional R&D projects and other consultancy activities. Digital institutional repositories have become a hot topic over the last few years, and many institutions around the world are now actively considering or working towards implementing them. NML established its Institutional repository in September 2009, providing its researchers with an easy solution for Open access and has undertaken a pilot project. This paper discusses some of the details of this initiative.

2. NEED OF S&T STAFF / FACULTY / RESEARCHER

- Knowledge / Resource Sharing
- Traceability of earlier work
- Archival benefit of document
- Recognition in their fields
- Appreciations of peers / colleagues
- Citations/Continuation of their research work
- Collaborative projects (International / National)

3. BACKGROUND OF IR AT CSIR-NML

The National Metallurgical Laboratory (NML), Jamshedpur, India established in 1950 under the aegis the Council of Scientific & Industrial Research (CSIR), India has been catering to the needs of Indian industries in the area of minerals, metals and materials (www.nmlindia.org) through the pioneering vision of first Indian Prime Minister of Republic India, Pandit Jawaharlal Nehru. It is the oldest metallurgical research laboratories in India having highly qualified engineers, technologists and researchers.

Over the last sixty-four years, lots of R&D results / reports / publications / lecture notes / presentations / patents etc. were generated and most of these documents were brought out by the

laboratory in print format. Therefore, these documents had a limited circulation. Considering the value of these printed documents, it was planned to develop a system which will have a global access and knowledge sharing to information seekers.

The exceptional research legacy (since 1950) of CSIR-NML gradually was getting mutilated and disappearing from the resource base, thereby, limiting wide spread utility by the scientific community both inside as well as outside the laboratory. Accordingly, it was strongly felt that an ICT based IR be established to provide open access to the laboratory's scientific output. CSIR-NML Knowledge Resource Centre (KRC) took the lead and motivated the scientists, technical officers and researchers to come forward with their intellectual products / documents to upload for a digital format on the Eprints platform created at NML.

4. NML-KNOWLEDGE RESOURCE CENTRE

The Information Management & Dissemination Centre (IMD Centre also referred as Knowledge Resource Centre) of National Metallurgical Laboratory supports scientists with up-to-date R&D information backup through well-organized centrally located Library & Information Centre, data processing facilities, documentation, online access to its subscribed e-journals and global databases. NML-KRC took the lead and motivated the scientists and researchers to come forward with their intellectual products / documents to upload on the Eprints platform. Initially, the authors were reluctant to deposit their documents in Open Access repositories. The reasons could be: (i) uncertainty and fear on copyright Issues, (ii) reservations regarding who and how the material would be used, (iii) uncertainty about who gets attribution, impact and scholarly credit, (iv) Myth of low quality material in institutional repositories, (v) Unfriendly submission procedures, (vi) Lack of mandatory provisions to deposit, and so on. However, these apprehensions could be overcome and that finally led to a high quality repository at NML.

5. OBJECTIVES OF THE STUDY

The objectives of the study are to identify the following factors with regard to NML Eprints:
- the extent of IR development and share experiences in using Eprints software
- CSIR-NML's global visibility through eprints gateway
- document wise distribution of uploaded papers
- the role of IR in scholarly communication and citation
- highlight challenges of enabling IR in NML, and
- the future of IR in scientific communities.

6. RESOURCES ACQUIRED TO BUILD INSTITUTIONAL REPOSITORY

Hardware and Software Requirements: For the full-fledged implementation of Institutional Repository, there is a need for proper infrastructure, hardware and open source software. Two Personal Computers with the P-IV configuration are enough for undertaking digitization processes. A separate high-end server which is functional 24/7 is required for an Institutional Repository. More disk space is required for back-up of the data. RAM capacity should be adequate to store the graphic data. Scanners of various capacities from simple flat-bed scanners to heavy duty scanners are available. However, it should be ensured that the software attached to the scanner has the facility of Optical Character Recognition (OCR) conversion. For the present pilot study, a flat-bed HP 8390 ADF scanner is available. There is several open source software available which can be used for building an Institutional Repository. For the present purpose, a comparative study of three open source software viz., Greenstone Digital Library Software (GSDL), EPrints and DSpace was carried out. However, for building an Institutional Repository in NML, it was decided to opt for Eprints, is completely customizable to fit the needs.

Human Resources: Human resources are one of the most important requirements for building an Institutional Repository. The staff has to be dedicated. They need not be IT professionals. However, they should possess some skill sets needed for different activities such as installation of various software, scanning and digitization, uploading of files and other activities involved with EPrints and etc.

7. IMPLEMENTATION OF THE PROJECT

Installation of Eprints: *Eprints* – The open source software, developed at Southampton University in the United Kingdom, London and used for creating digital repositories was opted at NML and Eprints 3.1.3 was finally selected. A dedicated server was procured and installed in the NML-Knowledge Resource Centre (KRC). Eprints software was then installed and customized.

The repository was given a name Eprints@NML and launched services on September 19, 2009. Since inception, the repository has been growing steadily in terms of the number of records it holds and users it has attracted. As on date there are around 5828 documents uploaded in the NML repository by the scientists, researchers and library staff.

CSIR-NML's global visibility through eprints gateway: In September, 2009, there were 12,363 hits from 7 countries and 6,333 pages of downloads. Eprints@ NML is registered with OAIister, Open DOAR, ROAR and indexed by search engines like - Google, Google Scholar, Base, Scirus etc. A list of full-text requests of individual NML paper was directly emailed to the corresponding authors for onward action. NML Scientists received lot of articles requests and enquiries on the subjects and technology, which motivate them further to enrich the repository by uploading their research outputs. As a result by the end of July, 2014 there are above 5828 uploads against 393 documents in 2009.

In the last two year, CSIR-NML's repository has attained high global visibility and also popularity. By the end of this financial year of operation, interest in their work has increased phenomenally and NML institutional repository has achieved 25 fold increase in traffic, with over 0.3 million hits/month and a cumulative total of over 5.78 million hits since inception. The maximum number of countries

access NML Eprints was 142 in the last 7 months. Accordingly, the access to the repository also increased phenomenally as given in Figure 1.
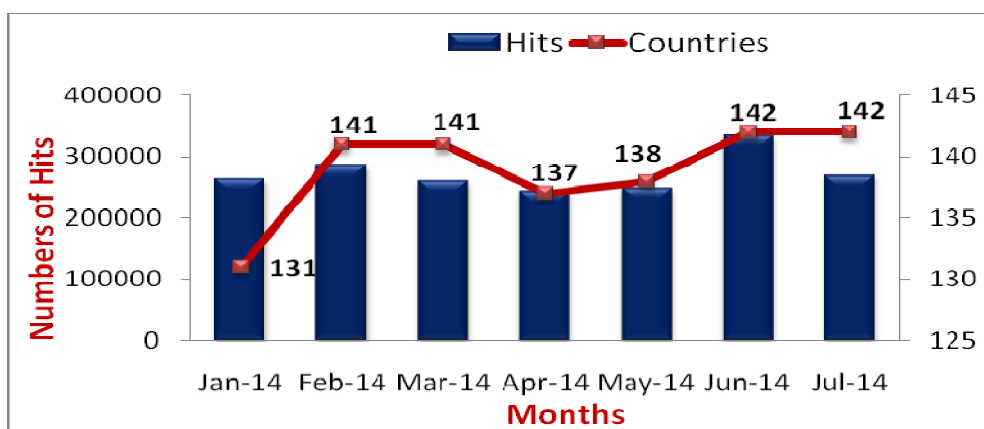
Fig. 1: Showing Growth of NML Eprints in terms of Hits and Countries

Document wise distribution of uploaded papers: More than 55% of NML scientists got registered with Eprints@NML for uploading their documents. As a result by the end of July, 2014 there are above 5828 uploads against 393 documents in 2009. The type of documents is given in Table 1.

Table 1: Document types as on July 20, 2014

Document Type	Number	Description
Annual Report	55	Record of activities performed by the Institute
Article	3426	An article in a journal, magazine, newspaper
Book Section	243	A chapter or section in a book
Conference Item	1868	A paper, poster, speech, lecture or presentation given at a conference, workshop or other event
Project Reports	131	A technical report, project report, documentation, manual, working paper
Patent	18	A published patent
Thesis	54	A thesis or dissertation
Others	33	Something within the scope of the repository

Growth of Research Publications, Citation and NML IR (Eprints): 71 SCI papers were published from CSIR-NML during 2014 calendar year. These papers are regularly uploaded in Laboratory's Institutional Repository. The citation the cumulative SCI publications (1986 onwards) from CSIR-NML has increased from 17305 (in 2013) to 19835 (in 2014) over a period of last one year registering an increase of about 14.62% growth. The average citation per paper is 9.23 against 8.33 in the last seven months. 80 articles received more than 50 citations/paper (source: Web of science / Google scholar) as on Jul 25, 2014 (Figure 2).

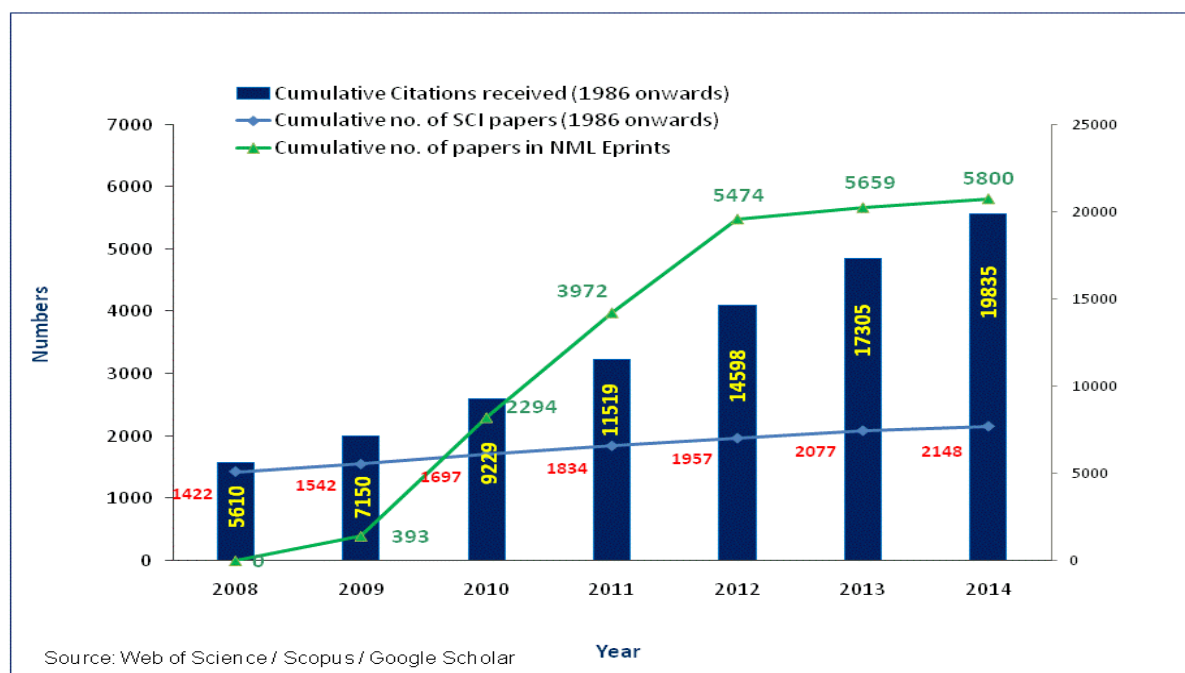**Fig. 2: Growth of Research Publications, Citation and NML IR**

How we succeed in IR?
- Uncertainty and fear on copyright issues were overcome by organizing workshop and training programme.
- Initially, the authors were reluctant to deposit their documents in open access NML Eprints. The same was overcome by personal contact and counseling.
- Uncertainty about who gets attribution, impact and scholarly credit were overcome by counseling and showing impact in individual's citation value.
- Workshops / Trainings were continuously held which motivated the authors and researchers to come forward with their intellectual products / documents in uploading them for a global exposure against lots of adversities.
- E-mail to scientific communities to upload their papers. If they have hard copy, it may scan and upload in IR.

Benefit to Scientific Community:
- Rise in the impact factor of the journals wherein such scholarly communications were made.
- Benefits to the weaker section of the society due to free access.
- Wider circulation of scholarly communication and rise in citation value of individuals well as organization.
- Support to initiation of new collaborations at National and International levels through Research exchange programme.
- Enhancing institutional business as Scope and Cash-flow.

Immediate Benefits:
In this context it is to be noted that NML used to publish one Technical Journal named '*NML Technical Journal*' (ISSN 0027-6839) since 1959 which is also a refereed Journal and abstracted in Metal Abstract, Chemical Abstract, Ceramic Abstract and in other databases. This journal was renamed as '*Journal of Metallurgy and Materials Science*' (ISSN 0972-4257 print ISSN 0974-1267 online) in 2000. Currently, the articles of the journals are uploaded in NML EPrints. Interestingly, the maximum requests are being received for the full-text article of this journal.

8. CONCLUSION

There was an inner desire of scientists/technologists for projection of a greater visibility of their research findings, as evident from the significant uprise of the data inputs from the scientists. Further, this will also indirectly give rise to a moral boost to the technical and system administrative personnel for further developments of this platform. Presently, there are 57 institutional archives in India which are listed in the ROAR. Eprints@NML ranks 5th in the list of India with registered interoperable archives in ROAR and International ranking under 682 achieved within two year of its birth. In future, sustainable growth of citations and impact of NML research will be seen in globe.

9. ACKNOWLEDGMENT

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CLOUD COMPUTING AND ITS APPLICATION IN LIBRARY DOMAIN

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1. INTRODUCTION

With the prolific advancement in Information and Communications Technology (ICT) over the last decade, there is an increasingly perceived vision that computing will one day be the 5th utility (after water, electricity, gas, and telephony). Several computing paradigms have promised to deliver this *utility computing* vision and these include cluster computing, Grid computing, and more recently *Cloud computing*. In library environment this fifth utility is playing a leading role in collection, storage, organization, processing, analysis and dissemination of information. Libraries are moving in a new direction by accepting new technologies, as they suit the present information handling and satisfy the needs of the knowledge society. Everyday some new concepts are being added to ease the practice in the libraries. With the advancements in information technology, libraries have become automated and followed by library networks and virtual libraries which is the basic need of today's techno savvy library patrons. The emergence of e-documents, digital libraries, internet usage, Web2.0 tools application, and library consortium practices etc. are some of the major consequences of IT usage in library activities[1]. This increasing technology complex is helping as well as creating constraint on libraries as they do not have adequate skilled personal. The latest technology "cloud computing" provides almost all the technological facilities needed in a library at the cost of very less skilled personal and computing devices. Although, libraries have been using some cloud computing services for over a decade, in this chapter we have attempted to understand the concept of cloud computing and how it can be used in libraries in present context.

2. CONCEPT

In 1969, Leonard Kleinrock one of the chief scientists of the original Advanced Research Projects Agency Network (ARPANET) project which seeded the Internet, said: "As of now, computer networks are still in their infancy, but as they grow up and become sophisticated, we will probably see the spread of '*computer utilities*' which, like present electric and telephone utilities, will service individual homes and offices across the country". This vision of the computing utility based on the service provisioning model anticipates the massive transformation of the entire computing industry in the 21st century whereby computing services will be readily available on demand, like other utility services available in today's society. To the best of knowledge, *Technology Review* first tracked the coinage of the term back in 1996. In virtue, the birth of the term cloud computing in some documents is traced out in 2006, when Google and Amazon began using "cloud computing" to describe the new paradigm in which people are increasingly accessing software, computing power, and handling files over the World wide web instead of on their desktops.

Cloud computing," to put it simply, means "Internet Computing." The Internet is commonly visualized as clouds; hence the term "cloud computing" for computation done through the Internet.

With Cloud Computing users can access database resources via the Internet from anywhere, for as long as they need, without worrying about any maintenance or management of actual resources[2]. Commercial companies used cloud computing as 'services' to end-users under a usage-based payment model. They are concentrating to develop software for millions to consume as a service, rather than to run on their individual computers.

Oxford dictionary defines the phrase cloud computing as, "The practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer". Clouds can be classified as public, private or hybrid. Cloud computing is the delivery of computing as a service rather than a product, where by shared resources, software, and information are provided to computers and other devices as a metered service over a network (typically the Internet). Cloud computing provides computation, software, data access, and storage resources without requiring cloud users to know the location and other details of the computing infrastructure. End users access cloud based applications through a web browser or a light weight desktop or mobile app, while the business software and data are stored on servers at a remote location[3].

In other words "Cloud computing is a new technology model for IT services which many businesses and organizations are adopting. It allows them to avoid locally hosting multiple servers and equipment and constantly dealing with hardware failure, software installs, upgrades and compatibility issues [4]. With cloud computing, hardware and functionality traditionally installed and run in a local environment is now performed on the network, in the Internet cloud. For many organizations, cloud computing can simplify processes and save time and money. Anyone connected to the Internet is probably using some type of cloud computing on a regular basis. Whether they are using Google's Gmail, Google Drive, organizing photos on Flickr or searching the Web with Bing they are engaged in cloud computing.

3. TYPES OF CLOUD COMPUTING

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, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction[5]. The model is composed of three service models and four deployment models:

Service Models: Software as a Service (SaaS)- Under this model vendor provides entire suit of service on the cloud. A complete application is offered to the customer, as a service on demand. The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings. SaaS is offered by companies such as Google, Sales force, Microsoft, Zoho, etc.

Platform as a Service (PaaS): In this model the vendor provides the application development platform for development of applications by any organization to build, test and deploy web-based applications [3]. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment. 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 AppEngine, Force.com, etc are some of the popular PaaS examples.

Infrastructure as a Service (IaaS): Under this model vendors provide infrastructure services (e.g. servers, storage, network, etc.) in the Cloud. The consumer is able to deploy and run arbitrary

software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited control of select networking components (e.g., host firewalls). Some common examples are Amazon, GoGrid, 3 Tera, etc.

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 general 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).

How to work Cloud Computing: In a cloud computing environment, the traditional role of service provider is divided into two: the infrastructure providers who manage cloud platforms and lease resources according to a usage-based pricing model, and service providers, who rent resources from one or many infrastructure providers to serve the end users. The emergence of cloud computing has made a tremendous impact on the Information Technology (IT) industry over the past few years, where large companies such as Google, Amazon and Microsoft strive to provide more powerful, reliable and cost-efficient cloud platforms, and business enterprises seek to reshape their business models to gain benefit from this new paradigm [6].

Why the Cloud Computing is required:
- **No up-front investment:** Cloud computing uses a pay-as you-go pricing model. A service provider does not need to invest in the infrastructure to start gaining benefit from cloud computing. It simply rents resources from the cloud according to its own needs and pay for the usage [7].
- **Lowering operating cost:** Resources in a cloud environment can be rapidly allocated and de-allocated on demand. Hence, a service provider no longer needs to provision capacities according to the peak load. This provides huge savings since resources can be released to save on operating costs when service demand is low.
- **Highly scalable:** Infrastructure providers pool large amount of resources from data centres and make them easily accessible. A service provider can easily expand its service to large scales in order to handle rapid increase in service demands (e.g., flash-crowd effect). This model is sometimes called surge computing [8].
- **Broad Network access and Easy access:** Services hosted in the cloud are generally web-based. Therefore, they are easily accessible through a variety of devices with Internet connections. These devices not only include desktop and laptop computers, but also cell phones and PDAs.
- **Reducing risks and maintenance expenses:** By outsourcing the service infrastructure to the clouds, a service provider shifts its risks (such as hardware failures) to infrastructure providers, who often have better expertise and are better equipped for managing these risks.

In addition, a service provider can cut down the hardware maintenance and the staff training costs.

- **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.
- **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. 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 [9].
- **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.

Available Cloud Computing Platform: Currently there are a few cloud computing providers which can be used by anybody. Probably the most known provider is Amazon with its Amazon Web Services (AWS). Google has taken a slightly different approach with its Google App Engine by providing only a software platform. Microsoft has tried to catch up to Amazon and Google by introducing Live Mesh and a preview of Azure.

- **Google App Engine:** The core of Google's business is all in Cloud Computing. Services delivered over network connections include search, e-mail, online mapping, office productivity (including documents, spreadsheets, presentations, and databases), collaboration, social networking and voice, video, data services[7]. **GAE is a** platform services which offers application programming interface to Google product like Google account and email services, Google Docs etc. Google offers every user some resources for free and the user only has to pay if he exceeds these free resources. This means that testing GAE is easy and free, the only thing the user needs is a Google account.
- **Dropbox (www.dropbox.com/):** Dropbox is a file hosting service operated by Dropbox, Inc., headquartered in San Francisco, California, that offers cloud storage, file synchronization, personal cloud, and client software. Dropbox allows users to create a special folder on their computers, which synchronized by Dropbox so that it appears to be the same folder (with the same contents) regardless of which computer is used to view it. Files placed in this folder are accessible via the folder or through the DropBox website and a mobile app from anywhere[10]. Dropbox was founded in 2007 by Drew Houston and Arash Ferdowsi, as a Y Combinatory startup company. Dropbox provides client software for Microsoft Windows, Mac OS X, Linux, Android, iOS, BlackBerry OS and web browsers. It is available in 16 languages. Dropbox add-ons facility allows users to email files to their Dropboxes and Mover for online backup of FTP, data integrity and relational database management system (RDBMS).
- **VMware (www.vmware.com/in):** Provides several technologies of critical importance to enabling cloud computing, and has also started offering its own cloud computing on demand capability called Cloud. This type of capability allows enterprises to leverage virtualized clouds inside their own IT infrastructure or hosted with external service providers.
- **Amazon (www.aws.amazon.com/):** As the world's largest online retailer, the core of Amazon's business is ecommerce. While ecommerce itself can be considered Cloud Computing, Amazon has also been providing capabilities which give IT department's direct access to Amazon compute power. Key examples include S3 (Simple Storage Services) and EC2. Any internet user

can access storage in S3 and access stored objects from anywhere on the Internet. EC2 is the Elastic Compute Cloud, a virtual computing infrastructure able to run diverse applications ranging from web hosts to simulations or anywhere in between. This is all available for a very low cost per user [7].

- **Microsoft:** Traditionally Microsoft's core business has been in device operating systems and device office automation software. Since the early days of the Internet Microsoft has also provided web hosting, online e-mail and many other cloud services. Microsoft now also provides office automation capabilities via a cloud ("Office Live") in an approach referred to as "Software Plus Services" vice "Software as a Service" to allow synchronous/asynchronous integration of online Cloud documents with their traditional offline desktop-resident versions

- **Bluelock (www.bluelock.com/):** It is a service oriented cloud providers which gives facility to a redundant and environmental control cloud services.

- **Citrix (www.citrix.com/):** Citrix Systems, Inc. provides server, application and desktop virtualization, networking, software-as-a-service (SaaS), and cloud computing technologies found in 1989.

- **Joyent (www.joyent.com/):** JoyentInc is software and Services Company based in San Francisco, California found in 2004. The company specializes in application virtualization and cloud computing.

- **Terremark (www.verizonenterprise.com/solutions/cloud/):** it offers services which include managed hosting, colocation, disaster recovery, data storage, and cloud computing.

Advantages of Cloud Computing in Libraries: Libraries more than ever face the need to fulfill their missions with ever few resources, cloud computing can furnish the libraries with following advantages:

- **Solve the Space problem:** Library works as an information centre where huge data are store so library always have space problem. As an increasing portion of the library's collection shifts to electronic and digital resources, Cloud Computing can solve the space problem.

- **Storage of rare collection:** Cloud computing has large potential for libraries. Libraries may put more and more content into the cloud. All historical and rare documents would be scanned into a comprehensive, easily searchable database and would be accessible to any researcher.

- **Easy access:** Cloud computing is involved in facilitating storage and access of data from anywhere over Internet. It becomes easy for more than one user to access the library documents at a time form different locations. There is no need to come to the library and wait for their turn to get a required book or information.

- **Solve to geographical barrier:** Library and information centres main function is to keep users abreast of the new developments in all over the world or beyond the geographical boundaries. Cloud computing can prove itself as very cost-effective tool to break the geographical boundaries and share knowledge.

- **Searchable data:** Cloud computing is not only providing storage and access of data but search facility is also available. Library services such as OPAC or Online Union catalogue are the best example of this. Another example is WorldCat Local where OCLC along with Google are exchanging data in the cloud to facilitate the searching of library collections through Google search services in a single interface.

- **Cost saving:** Libraries face problems in having adequate budget against the rapidly changing technological environment**.** In this state of affairs cloud computing can be used as a very cost-effective storage and retrieval tool for the library. It can show huge cost advantage between cloud storage and local storage. It may be possible to have even better automation services through cloud computing. On the other hand adoption of cloud computing will facilitate a library in to cut their budget from expensive computing devices. It will make the library focus more on generating new innovative services and products.

- **Flexibility and Innovation:** Cloud computing can provide more flexibility to the libraries those are not closely aligned with a parent organization regarding how to manage their services. The

library can have their own mail system, storage over network, productivity applications on its own, and then it may be beneficiary for the libraries to move towards cloud computing based services.

- **Libraries from LAN to WAN:** Cloud computing has provided great support to the libraries in becoming "houses of access" rather than only "houses of knowledge". Through LAN the access to the library collection was limited to the organization or institution. However, cloud computing has bring to an end the limitations of being a part of library networking for sharing documents and services from remote areas. No need of formal library networking, only Internet access is enough.

- **Save the Manpower, energy and time:** Application of cloud computing in libraries qualifies the fourth law of the library science. As all the main tasks of the libraries (storage, access, searching, maintenance and sharing knowledge etc.) are possible to be managed online without any special effort by the application of cloud computing, it will save a lot of manpower, energy and time of the library.

- **No problem for local hardware error and maintenances:** Application of cloud computing in library will lead the storage and maintenance of the data, resources and services on the remote server. So there is no requisite of having so much computing devices (hardware and software) and its maintenance at local level.

Table 2: Implications of Cloud Computing in Libraries

Cloud Computing in Library				
Union Catalogue	Networks	Data Bases	Cloud library	Other
OCLC World Share	INFLIBNET	Emerald,	Exlibris Alma	Slide Share
IndCat: Online Union Catalouge of Indian Universities	Research Gate Scientific Network	Springer	OCLC, Library of Congress (LC) Exlibris, Polaris Scribd.	
AgriCat		Web of Science etc.	Discovery Service Google Docs / Google Scholar Worldcat, Encore	

4. CONCLUSION

Cloud computing builds on decades of research in virtualization, distributed computing, utility computing, more recently networking, and web software services. It implies a service oriented architecture, reduced information technology overhead forth end-user, great flexibility, reduced total cost of ownership, on demand services and many other things. In today's global competitive market, libraries must innovate and get the most from its resources to achieve its estimated goals. Cloud computing infrastructures are next generation platforms that can provide tremendous value to companies of any size. They can help libraries achieve more efficient use of their IT hardware and software investments and provide a means to accelerate the adoption of innovations. Cloud computing increases profitability by improving resource utilization. Costs are driven down by delivering appropriate resources only for the time those resources are needed. Cloud computing has enabled teams and organizations to streamline lengthy procurement processes. Cloud computing enables innovation by lessen the need of innovators to find resources to develop, test, and make their innovations available to the user community. Innovators are free to focus on the innovation rather than the logistics of finding and managing resources that enable the innovation. Cloud computing provides multitasking services to the users. However it has been found that users hesitate in using cloud computing due to the fear over security, possession, and outflow of information. The characteristics of cloud computing visualises us that implication of this technology will increase the

efficiency of the implementing library.

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STATUS OF DIGITIZATION OF LIBRARY OF ENGINEERING COLLEGES : A STUDY

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1. INTRODUCTION

Change is the law of nature. In the present time, the emergence of information and telecommunication technology has resulted drastic change in the way the library perform their functions. Since traditional reading materials such as books, periodicals, newspapers, manuscripts etc are perishable; there is danger of losing them permanently for future generations. Keeping in view the technological advancement and availability of required hardware and software, it is justified to move digital library for enhancement of overall effectiveness of library and information centre. The information revolution not only supplies technology horsepower that drives digital libraries but fuels on unprecedented demands for storing, organizing and accessing information in the currency of the knowledge economy, digital libraries will be the banks where it is invested creation of digital resources with the establishment of digital libraries is the need of the day.

The growth of digital technology has revolutionized the methods of information processing storage and retrieval and also several aspects of higher education system. On account of financial crunch many academic libraries have not been able to procure journals and reports which are essential for the ongoing academic and research programs .The individual institution/libraries are unable to acquire each and every relevant information sources to meet the needs of and requirements. Therefore, the institution/libraries have started relaying on digital media in order to supplement the conventional library materials. In the light of the above trends and development it has been found that there is a need for a detailed study and also to analyze the essential of the needs and impact of digitization on the information on users.

2. STATEMENT OF THE PROBLEM AND ITS SIGNIFICANCE

In the current globalize scenario, no system is perpetual, hence everything is going to be changed. If any organization has to be existing effectively, it should be keeping pace with time and should welcome changes. Library is a nonprofit organization facing lots of constraints like budgetary curtailments, declined customer base, shortage of trained manpower, inadequate space, lack of professional zeal and work culture etc. All these leads to efficient and effective use of manpower within librarian's limitations, hence digital library initiatives would be the only viable solution to control the vast amount of bibliographic data emerged out of publication delay information explosion and information overflow. The present investigation therefore will be pragmatically significant for the following reasons.

It aims to investigate whether existing facility and resources available in the engineering college libraries can be considered for digitization. Hence, the value of the statement of the present investigation, "Digitization of libraries of Engineering Colleges affiliated to West Bengal University of Technology: A Study" cannot be ignored.

3. LITERATURE REVIEW

Arora (2001) [1] in his study on "Building of Digital Libraries: An Overview" emphasizes digitization

process of print materials. He explains building of digital collection and the infrastructure required to access them is a challenge that every library has to deal with. The article revels into technological evolution Cultural Revolution and contents enrichments that led to revolution in growth and development & digital libraries.

Bendhani (2008) [2] has undertaken a survey "Digital Library System: A Need for Emerging Information Society" discussed in this information and electronics era, a digital/virtual library holds a key role in education and research in this context, the paper deals with the necessity of digital library system for the well-being of the present information society. Looking at the prominent role, a digital library plays in teaching and learning the discourse and focuses upon the issues pertaining to digital libraries and solution thereof and highlights special attention towards content creation storage and retrieval etc. The focal intention at the concluding remark of this paper is to attempt the need as well as prospects of digital library and the problems and with suggesting some solution to them.

Chowdhury in his paper ''Digital Natives and Virtual Learning Environment: A Case Study (2011) [3] described how higher educational institutions have realized the importance of virtual space to cater to the information needs of digital natives .This reports aimed to find out as to how undergraduate students at University of Technology Sydney (UTS) Australia use a virtual learning environment. The change in teaching method shows some cultural shift in learning. Class participation method encourages students to actively engage in discussion in the tutorial and make them more prepared for independent learning. Use of UTS online for the subject, more specifically the discussions board, encourage students to take part in discussion with issue related to assignments, and other aspects of the subject during the semester. Over all this study clearly shows that digital natives expect a blend of technology and content to gain in interactive and stimulating learning experience. Gupta (2002) [4] in his study "Digitization Pros and Cons" highlighted the strength and weakness of digitization in an archival environment and explore the pros and cons of digital archival material on the world with web and also explores some of the many issues involved in selecting and developing a digital archival collections.

Rouknuzzaman, Hasan and Akanda (2011) [5] in their article "A Framework for Knowledge Management Education in Digital Library Learning" discussed to suggest a modular approach to KM education in the realm of digital library learning and also review the scientific literature of the field and a mini-case analysis of the international master in digital management .The study describes emerging nations of DL and KM and explores the current state of DL learning and KM education in library and information science. IT analyses a mini-case and show that the IKM module of DILL comprises dimensions of content, context, people, process and technology. Finally, this paper proposes a framework of KM specialization in the DILL programme which consists of four modules based on the four major perspectives of KM information technology, business and human. However, DL professionals require a wide range of skills and competencies related to strategic management of information, IT management, business process management and human capital management to work in knowledge intensive organization like a DL.

Shukla (2011) [6] in his paper "Digitization Practices in India: Issues and Challenges" described the activities of CDAC, Noida and said that CDAC was bringing holography into the digital library wherein CDAC could combine text, audio and video together in to the library science jargon and present a projection system which could not be a flat screen bout would be a table in onto which a three-dimensional image would come up. You could more it around hook at it and get more information. Shukla affirmed that Raj Reddy of Carnegie Mellen University once said that about a billion books had been published in the world over and out of them only 15% books were available in print today, 85% were either out of print or archived somewhere. If this was the situation we are definitely getting access to just 15% of the available books. How could we bring this 15% up to 100% was the challenge? He added that this could be achieved through digitization of books. There were two steps to go through one were to create the content in the digital form and second was to create meta data for searching that content. He noted that in order to digitize books it is found that 15% of

them were copyright free. So under the mission it is found that less than 20% had specific copyrights and for 65% books copyright details were not clear. He said that more than 18 lakh books stored onto 4c terabyte space on a computer and it's accessible to the public.

Singh (2008) [7] Studied "Digital Preservation: Why and How" discussed how to digitize the library resources and how will they be handled, how to mange digital asset and how do you preserve a digital asset the selection of software for digitization. Shilpi Verma & K. L. Mahawar in their paper (2008) [8] "Digital Library Security: The challenges Ahead" described the modern world libraries are in transition phase from traditional to digital library and very important aspect of digital information delivery. They also stress the digital library security techniques such as cryptography digital signature firewalls, digital watermarking stenography are used for secure and effective digitization and digital assets to the end user.

Fatemeh, Abdullah and Chin (2013) [9] in their article "An Identification of a Model for Digital Library Critical Success Factors" is establish a comprehensive set of critical success factors (CSFs) that would enable successful digital libraries implementation. The results revealed six dimensions of CSFs and 36 potential success factor statements contributed by the study participants. Based on these findings, this paper postulates that successful deployment of a digital library implementation may depend on set of success factors. The identification of these factors have important implications on digital library development.

4. AIMS AND OBJECTIVES
The primary objective of the present study is to make investigation into the present state of digital library in the Engineering Colleges of West Bengal University Technology (WBUT).
- To make an assessment of the current status of digital library facilities.
- To motivate the library staff for digitization of their respective libraries.
- To enlist the criteria for identifying the library materials for digitization.
- To identify hardware, software, file format etc. requirements needed for digitization.
- To assess the present state of technical manpower available in the engineering college libraries and capabilities to undertake digitization.
- To identify the problems and constraints that prevent engineering college library from digitization of their respective collections.
- To unfold the core class of documents and software that predominates in the digitization planning of their concerned libraries.
- To unmark the extent to which the existing infrastructure and fiscal resources of engineering college library can make myth of digitization a reality.

5. HYPOTHESES
For the purpose of the present study, the following hypotheses have been formulated.
H1: The digitization of libraries among the engineering colleges of WBUT is in a state of infancy.
H2: Most of the library professionals in engineering colleges of WBUT are not well exposed to digital library techniques.
H3: The main hindrance for effective initiatives for library digitization in engineering colleges is lack of interest, work culture, attitude as well as motivation among the human resources at work.
H4: Majority of the library professionals working in these engineering colleges are over burdened with non professional and administrative works in the library.
H5: There is perhaps budgetary constrains for digitization of library documents in the engineering colleges.
H6: Copyright and licensing for digitization of journal articles would be major hindrance to be process of digitization.
H7: Academic and research community of engineering college demand heavily the digitization of

library collection particularly old and rare books and back volume journals articles for wider access of information.

H8:   The students, faculty and research scholars greatly benefitted by the digitization of the traditional paper documents of library under survey.

6. SIZE OF SAMPLE

The present study 'Digitization of Libraries of Engineering Colleges Affiliated to WBUT: A Study. Fifty-five (55) leading engineering college libraries have been taken in its ambits.

7. ANALYSIS

Digitized Documents: Libraries are digitized their documents according to their requirement and budget. To know the number of documents so far digitized, the respondent stated data has been reflected in table 1.

Table 1: Digitized Document

No. of Digitized Document	No. of Libraries	Percentage %	Cumulative %
More than 1 Lakh	0	0	0
50,000- 1 Lakh	0	0	0
25,000-50,000	0	0	0
10,000-25,000	15	30	30
25000-10000	5	10	40
1000-5000	6	12	52
Less than1000	11	22	74
Not responded	13	26	100
Total	50	100	100

From table1, it is evident that 15 (30%) has digitized its documents between 10,000-25,000 records of their libraries; 5 (10%) has digitized 5000-1000; 6 (12%) libraries digitized documents between 1000-5000 and 11 (22%) libraries digitized their libraries documents less than 1000. While 13 (26%) have neither digitized nor have a single digitized document so far which is quite surprising.

Budgets for Digitization: Budget is the crucial and vital factor, which influence heavily and contributes much for the progress of any institution. The success of any plan, program, and project relies upon the availability of funds. It is said that library exist for generation, dissemination and preservation of knowledge and to sustain maintain and further flourish library needs adequate budget.

Table 2: Budget for Digitization

Having Adequate Budget	No. of Libraries	Percentage	Cumulative %
Yes	6	12	12
No	42	84	96
No Response	2	4	100
Total	50	100	100

The table indicates that only 6 (12%) of the libraries have considered their library budget for digitization is adequate while 42 (84%) expressed their existing budget for digitization is not sufficient.

Content Already Digitized: Libraries digitized their resource according to their need and funds available. As we know digitization, not only increase the life span of the documents but also it facilitates long safer preservation, easily retrieval, resource sharing, saving valuable space and time. The study aimed to unfold the extent and the domain in which the libraries have been digitized reflected in table 4.17.

Table 3: Content Already Digitized

Type of Digitized Content	No. of libraries	Percentage	Cumulative %
Full documents contents	30	60	60
Partial content	15	30	90
Only bibliographical data	3	6	96
No response	2	4	100
Total	50	100	100

The above table indicates that 30 (60%) of the engineering college libraries have maintenance of DL content followed by 15 (30%) libraries have partially digitized their content, 3 (6%) libraries have digitized they are bibliographical data only, while 2 (4%) libraries are either in planning stage or have not digitized any documents so far.

Available Facilities for Digitization of Resources: For digitization of resources availability of various facilities like scanner, printer etc is essential. The respondents were therefore asked to state the question do you have any facility to digitize your resources? The responses are shown in table 4.

Table 4: Available Facilities for Digitization of Resources

Having Digitization Resources	No. of Libraries	Percentage	Cumulative %
YES	32	64	64
NO	10	20	84
No response	8	16	100
Total	50	100	100

The above table revealed that 32 (64%) out of 50 libraries have the facility to digitize their resources, while 10 (20%) libraries do not have the facility to digitize the resources and remaining 8 (16%) libraries have not respondent to this question as they may be planning stage or have no proposal of digitization of resources.

Facility of Digital Library:

Table 5: Facility of Digital Library

Having DL Facility	No. of Libraries	Percentage	Cumulative %
YES	45	90	90
NO	0	0	90
No response	5	10	100
Total	50	100	100

The above table depicted that 45 (95%) libraries strongly feel for digital library facility in their libraries and remaining 5 (10%) libraries have not responded which might be in planning stage or no proposal for automated their services in near future

Exposed to DL Concept and Techniques: To know the exposed to DL concept and techniques the following question were asked to the respondents and the data has been reflected in the table 6.

Table 6: Exposed to DL Concept and Techniques

Exposed to DL Concepts & Techniques	No. of Libraries	Percentage	Cumulative %
Strongly Exposed	40	80	80
Moderately Exposed	8	16	96
No Exposed	2	4	100
Total	50	100	100

The above table reflected that 40 (80%) of the libraries are strongly exposed the concept and techniques of DL, where as 8 (16%) are moderately exposed and 2 (4%) not exposed which may be

planning stage or no proposal for digitization of their resources.

8. SUGGESTIONS

Based on the observations, findings and analysis of the study them, investigator has made the following practicable and feasible suggestions:

- Before digitization of a library, the library need full automation, as it is found from the study that most of the libraries of WBUT are not fully automated, therefore the investigator suggested for library automation.
- Budget is the crucial and vital factor which influence heavily and contributes much for the plan and program which relies upon the availability of funds it is therefore suggested that the budget for the library should be adequate, so that the process of digitization cannot be hamper for digitization of the library.
- For establishing DL various hardware and software are needed to be integrated for the development and deployment of digital library. Therefore it is suggested that the latest hardware and software should be used in digitization.
- Staff plays a vital role in the library. If staffs are not efficient and well motivated, it may hamper the library services. It is therefore, recommended that the library should upgrade the technical skill of the existing staff with necessary training as well as implementation of the revised scale of pay of the library staff.
- Digital libraries are not isolated entities and rather part of use of research network. It requires standard practices in data capturing, file formatting, storage media and retrieval mechanism. The engineering college libraries of WBUT, therefore should adopt the national and international standard in digital library practices.
- One of the most constraints for the digitization is lack of adequate budget .The libraries can generate their own financial support by commercializing their library services, such as document delivery services, library research support services, bibliographical database services, information repacking etc. and the revenue thus generated can be utilized for digital ventures.

9. CONCLUSION

Digitization is a vital and significant area in modern day libraries .To make a live and dynamic library, it has to go digitally by preserving the endangered library resources. This can be a mixture of good policy, careful action, and healthy attitude towards digitization of library. In academic library particularly in engineering colleges of West Bengal, the concept of digital library is not yet a fully fledged due to budgetary constraint efficiency of staffs, IT expertise in the library, implementation of national and international standards, preservation policy and copyright etc.. Thus it is expected that the WBUT Engineering colleges being most of them newly established, it is right time to digitize the libraries for greater benefit of faculty and students community in particular.

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Section III
INFORMATION SERVICES

CUSTOMIZED INFORMATION SERVICES IN DIGITAL ENVIRONMENT : A SPECIAL REFERENCE TO MANAGEMENT LIBRARIES

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1. INTRODUCTION

The dramatic changes in Information and communication technologies (ICT) are resulting in unbelievable transformations in higher education. With this sweeping change, the teaching, learning and researches are becoming more interactive and collaborative, signaling a need for adoption of new methodologies in teaching and practice. An increased admission of tech-savvy students into management institutes are adding fuel to this scenario. The network based remote access to information is transforming the practice of teaching and functioning of libraries. Are b-school libraries working in challenging environment? The straight answer is yes. The challenges are from technology adoption and upgradation; diminishing geographical boundaries, impatient customers, increasing external service providers, managing electronic information and facilitating users to access to the same. The professional and social networks, e-discussion forums and online bookstores are added threats to the challenges. Tam and Robertson (2002: 369) argue that libraries and information services face many challenges from changes in the information environment, most of which have happened as a result of developments in electronic information resources and the evolution of digital age. These challenges are directing library and information (LIS) centres for deeper understanding of current challenges and devise appropriate methodologies to address these challenges. They need to be innovative and exhibit leadership qualities to provide satisfactory services to their customers. In this paper, the author attempts explain the current day challenges faced by libraries, nature of information service provisions, and concludes with issues related managing electronic resources and their access. It gathers inputs from management students, faculty members, alumni, librarians and websites of some leading b-school libraries. As the inputs are from real life situations, this paper is a significant contribution in the field of information service deliveries and serves as a model for many b-school libraries.

2. UNDERSTANDING CHALLENGING ENVIRONMENT

As tech-savvy students are increasingly entering management institutes, they are embracing new technology supported teaching-learning methodologies to transform traditional teaching to go with the modern trend. Libraries-the learning centres cannot escape from this scene and cannot rest on past glories of rich print resources and quality traditional service deliveries. Gone are the days of such luxury in today's IT driven world, as library users' focus is leaning towards electronic resources. Following is the current scenario in libraries:

- **Cannot rest on past glory:** the rich print collections supported by spacious physical library and good services are no more a point of pride as users' priorities are shifting towards electronic resources.
- **Cannot be proud of captive readers and longer hours of reading in library:** Now libraries cannot expect captive readers as they no more remain a unique source of information provision. They cannot expect readers sitting for longer hours in the library referring several books. The electronic resources are reducing the dependency on print resources. Users' short visits and

reduced footfalls to libraries are common sight in libraries. If librarians do not satisfy the user during their visits, even the short visits might get converted to occasional visits.

- **Come tomorrow - is dead:** librarians cannot afford to ask readers to wait for days to receive the requested books/documents. Today, readers feel much constrained by time and expect immediate response to their queries. Any delay in responding to users' queries will not only result in losing them but drive them out to look for other sources of information.
- **Rise of competitors:** libraries once considered as central place for provision of information are now facing serious competitions from web sources, commercial service vendors and online bookstores. The professional and social networks have emerged as significant sources of information.
- **Spurt in publishing in e-media:** publishers are publishing more e-books and e-journals and pushing them hard to find place in libraries. In near future, libraries may not have any option left except going for e-books and e-journals.
- **Blurring geographical boundaries:** As geographical distance and time zones are no more barriers for information retrieval, librarians cannot give such excuses for any delay in document deliveries. The present youth is well versed with latest technologies and expect immediate solution to their queries through their electronic devices such as laptop / mobiles / Iphones / Ipads / tablets etc from remote places.
- **Diminishing ask/contact librarian:** the librarian who was undisputed focal point for print reference sources is going behind the screen as most of them [ex. encyclopedias, dictionaries etc] are freely accessible instantly on net through portable devices. One can keep on citing several examples to illustrate the current scenario. In other words, users' fast changing needs, demand for quick fix solutions and desire for remote access are challenging library management to equip their libraries with digital resources and appropriate technology to access them. The access mechanism has to be devised to reach users whether they are in the library or at a remote place. Thus, development of electronic or digital resources, adequate finance, network access, assistance in scholarly publishing are viewed as some of the important responses of libraries for transforming the traditional library system into a multifaceted modern library system.

3. PLANNING INFORMATION SERVICES IN LIBRARIES/LEARNING CENTRES

The primary purpose of any library is to serve the users with relevant information at the shortest possible time whether he/she is in library or remote place. Gandhiji's (1989) messages to the people also focus on customer satisfaction. Normally, in B-school libraries, students, faculty, administrators, researchers, MDP/EEP participants and alumni constitute primary user segments. Further, they need to serve users of distant education too. The information requirements of these groups are different as each segment performs different role and service provisions are also subjected to priorities and objectives of parent body.

4. PLANNING INFORMATION SERVICES FOR MBA STUDENTS

The MBA students of residential programs reside in campus. During the study, they expect strong information support for their academic excellence and significant knowledge gain. They expect the information provision through their electronic devices via campus wide network. They wish to:

- Stay informed on industry news and trends
- Expand their knowledge base and prepare for class discussion,
- Research articles,
- Research market data for field studies and business plan contest,
- Further their career search & prepare for interviews,
- Look for support material for case analysis/discussions,
- Access the teaching notes of previous classroom teaching,

- Light readings/entertainment [inputs are from students, HBS & Wharton library websites]

In order to satisfy these student requirements; the libraries need to equip with hybrid collection of print and electronic resources and deliver them to users manually or through networks. Students prefer electronic resources more as compared to print resources. Libraries need to serve them with

- Industry or Corporate databases like ISI emerging markets; capital line; data monitor; crisil industry analysis; CMIE databases etc,
- Enriched subject areas with quality resources. Many libraries like TAPMI facilitate students with copy of prescribed textbooks and other reading materials in advance.
- Subscription to e-journals and FT journal databases like ebsco, proquest, emerald, science direct, IEEE Xplore, IMF, World Bank, Blackwell, sage, oxford etc,. Of late, publishers are allowing print copy subscribers to access archives of the journals and migrating from print to electronic media. This puts pressure on libraries to go for e-journals.
- Acquiring reports of marketing research agencies like BBDO, MARG, ORG, MODE etc; consulting firms like mckinney, PWC etc and credit rating agencies like CRISIL, ICRA etc.
- Provision of links to career opportunities. Bschools try their best to help students to find a suitable career opportunity. Beside company's ppts', the library need provide details of specific company so that students can have better choice of company for their career progress.
- Provision of relevant materials for an effective case analysis and discussion. Many institute attempts to develop management cases from summer project reports. This warrants provision of previous batch reports for referencing. Accessing them on net is the most desirable feature from students.
- Provision of class notes and presentations of previous classes on net adds value to students learning process. Students desire to read the previous class notes in case absence to the lecture sessions.
- Enriching the collection with resources like business novels, leaders' biographies, bestsellers, good reviewed books, etc, will not only refresh the minds of readers but also share the experiences of great leaders.

5. PLANNING INFORMATION SERVICES FOR FACULTY MEMBERS

Besides teaching, the faculty members have to perform other important roles like mentoring, consulting, research projects, MDPs/EEPs, publications, seminar/conference paper presentations, case writing and administration. In addition to the earlier said sources for students, the library services should aim at:

- Providing advance study materials and literature in their field of specialization to update their Knowledge and carry out research and consulting projects.
- Acquiring training manuals like Pfeiffer annuals, management/simulation games and videos developed by leading institutes. The training kits developed by psychological labs needs to be sourced by libraries.
- Keeping them updated with conference, seminar or workshops organized by national and international organizations.
- Sourcing and purchasing cases developed by leading organization like HBS, ECCH, Ivey, Darden, IIMs, IMDR etc. Librarian plays a significant role in obtaining membership and purchase of such cases to individual faculty members. TAPMI librarian is a model example for this role.
- Unlike books, faculty members need to refer various curriculum models to revise or update their curriculum; this is very difficult task and goes purely on personal contacts with other colleagues. The national project by IITs and IIMs (National program for technology enabled learning-NPTEL) has resulted in creating online repository of model curriculums, which is benefitting the academic fraternity. As per AICTE guidelines, the member libraries should enable this facility to their students and faculty members.

6. PLANNING INFORMATION SERVICES FOR RESEARCH SCHOLARS

The research scholars are specialized users of the library. They may be engaged in full-time or part-time research studies. Unlike students, the researchers keep moving for literature search and data collection. This user segment appreciates access to customized information services on electronic networks. Like faculty members, they also need to be served with advanced literatures. The effectiveness of library lies in its networking capability with other service providers.

7. PLANNING INFORMATION SERVICES FOR ALUMNI

The alumni are products of an academic institute. They wish to stay connected and contribute to the overall growth of their alma mater. The major challenge is to obtain their contact details and stay connected with them. Libraries go beyond the boundaries to reach alumni with news of events, academic news, industry related reports, career opportunities, and personalized birthday greetings. They can act as catalyst between industry- institution interactions. TAPMI librarian is role model for such extraordinary role to stay connected with alumni. Length of experience with institute plays a dominating role in this direction. Unlike current students, the alumni need to be connected via electronic networks. Web resources, web-OPAC, web-access and Facebook/yahoo/Google groups play significant role to reach alumni.

8. PLANNING INFORMATION SERVICES FOR DISTANCE EDUCATION

Of late, distance mode of management education is increasingly catching attention graduates working in various organizations. On similar lines with services to alumni, web-based information services are most desirable and expected benefits from libraries. Libraries should satisfy them with provision of academic, industry and research related resources.

9. PLANNING INFORMATION SERVICES FOR EEP/MDP PARTICIPANTS

This group of users uses the library for a short period when they are attending the training programs in the institute. The duration of stay depends on the nature of training program conducted by the institute. These participants are entitled to avail all the services that are provided to current students. The provision of service to them after the training program is subjected to the policy guidelines of the institute.

10. SERVICE DELIVERIES OR ACCESS TO THE USERS

It is not sufficient if the library attempts to build quality collection as it is equally important to make such resources available/accessible to users. It is the order of the day and inevitable for library management to channelize their efforts in building the collection of electronic resources for the benefit of their users. As online access is increasingly preferred by the users, the libraries need to:

- Make their resources accessible on intranet/internet;
- Develop web-OPAC for remote access to catalog search and provision online requests;
- Provide remote access their alumni, administrators and students of distance education;(the access could be restricted or open depending on nature of resource)
- Develop own web-sites/pages for information search and access by users;
- Obtain memberships with national and international bodies like AMA, SSRN, DELNET, INDEST, INFOLINE etc.;
- Obtain online access to journals that subscribed in print journals;
- Obtain memberships with case developing institutes like HBS, ECCH, ACR, IIIMA, Darden, Ivey for acquiring cases and TNs for faculty members and act as nodal place for depositing cases developed by them,

- Act as contact points for alumni by regular contact with them through newsletters, forwarding career opportunities, sending personalized birthday/season's greetings and guide them to how to obtain transcripts from the institute. TAPMI librarian is model example for this role.
- Recently, American libraries are approaching institutes for membership to promote their web-portal "e-India". With highly subsidized rate (@Rs.400/member), an individual member can have remote access to several databases. TAPMI library has already captured this facility for its users.
- Similarly UGC's Nlist and INFLIBNET's Infonet allowing their members to access databases subscribed by them;
- Recently, the commercial database aggregators like ebsco, proquest and informatics are promoting "Discovery service", which is a single window interface tool (like Google custom window) to search local as subscribed databases. This service will replace the earlier Federated search engines, A-Z service etc.

11. MANAGING THE ACCESS TO THE USERS

The development of digital documents and their preservation is an essential step towards building digital repositories. Unlike print resources, developing/managing electronic resources completely dependent on technology supported devices, adaption of appropriate technology and financial support by the parent body. While resources, scanners, storage devices, infrastructure and skilled personnel are the pre-requisites for digital resources, network access (online/offline) is critical for accessing those resources. The Type of access depends on the technology installed and mode of access provided in the institute. An appropriate search engine is also desirable to search and retrieve the archived data properly. Though campus wide network, Wi-Fi connectivity and web-access are user demands, the provision of the same depends on the priorities pro-activeness from the parent body. Organizations can choose open source or proprietary software for providing access to digital resources.

According to the Directory of Open Access Repositories (DOAR) (Wikipedia), a majority of Institutional Repositories (IR) is built using Open Source Software such as dSpace, Green Stone, Fedora, Eprints etc. However, Wang (2011) says that law school libraries in U.S. chose proprietary platforms to implement repositories because they are easy to set up, customize and maintain with the technical and developmental support they provide. Lack of expertise, fear of breakdown, data migration to different platform, upgrading to new versions, etc., could also act as factors that might drive organisations to go for proprietary software. This situation might be true with large number of academic libraries in India including university libraries.

12. DIFFICULTIES AND DEFICIENCIES IN MANAGING DIGITAL RESOURCES AND THEIR ACCESS

Though the process of online service deliveries appears very simple and easy to understand, it has to cross several hurdles like technology adoption, administrative clearance, financial support and skilled manpower to carry out the task. Wang (2011, p81) points that that unlike large university libraries, law school libraries are usually behind on digital initiative activities because of smaller budgets, fewer resources and lack of staff and expertise[p81]. Though the above statement is made in US context, the situation is very different in a large number of libraries in India including university libraries. Further, the level of responsibility delegated to library personnel also decides the direction of the journey. The problems and issues that normally encountered by libraries while developing resources and providing access are:

- Lack of visualization of legal consequences while digitizing copyrighted materials (published books and articles). Oppenheim (2000) stresses the legal implications of digitizing documents and warns information professionals to take care of copyright and other legal issues during digitization.
- Copyright issues of faculty publications published in books and journals. The authors cannot incorporate their own publications in books and other materials without copyright clearance from publishers.

- It is a real challenge to consolidate faculty and in-house publications [internal records, admission/placement handbooks, college magazines, course manuals, rules/ regulations, working papers, case studies, research compendiums, conference proceedings, annual reports etc] that are scattered through various departments and Individuals.
- Absence of central archival policy for faculty and institute publications adds to the woes of consolidation. The digital repositories are built by author's voluntary submissions in the institutions that may not enforce such guidelines for various reasons.
- Absence of policy for submission of soft copies of student project reports in standard formats strains consolidation efforts.
- Lack of long experienced staff and faculty for tracing the history in the absence of records;
- Lack or inadequate skilled manpower to carry out the task
- Inadequate digitizing & storage equipments, infrastructure facilities and appropriate technology
- Lack of financial allocation for the purchase of equipment, establishing required infrastructure and training/selection of skilled personnel. This aspect is not seen favourably in a majority of institutes. The cost of acquiring digital resources is not economical when compared to print resources. But is economical if multiple usages are considered. This is not viewed in favourably in large number of institutions. The cost against their relevance and utility to the user community needs to be judged while acquiring such resources from external agencies.
- In general, technology becomes the major bottleneck in providing access to readers. Technology obsolescence and high cost of their replacement adds to the delay in technological up-gradation /installation in most of the organizations.

Walker; Stanton; Jenkins; Salmon and Rafferty (2010) highlight that interfacing and access problems have been cited as critical factors in the optimal performance of digital command and control system. Infrastructural inadequacies or deficiencies become barriers for making resources accessible by their users. The dilemmas are in setting up priorities, selection of resources; adoption of technology, mode of digitizing (self/outsourcing); central archiving and point of control. Walker; Stanton; Jenkins; Salmon and Rafferty (2010) stress the dilemmas over command, control, people and technology and the amount of unpredictability in interpreting those plans into actions. The difficulties are related to comprehensiveness of institute's historical data, choice of central location for archive and its managing. The difficulties are in selecting appropriate technologies and process for developing necessary infrastructure. Experienced staff will definitely add value for such attempts. However, the difficulty lies in retaining them. Walker; Stanton; Jenkins; Salmon and Rafferty (2010) also support the above difficulties by pointing to the difficulty of choosing simple technology combined with socio technical system coupled with difficulty of understanding technology, well specified goals and creation of system from scratch

The deficiencies or inadequacies related to lack of comprehensiveness in internal records, inadequacy in infrastructure, shortage of finance, absence of policy guidelines and lack of skilled manpower. This could also couple with defective/inappropriate decisions while choosing technology/systems/processes. Reidy (2002) stresses that the real problems related to digitization such as funding, selection of resources & technology, authenticity, conservation, standardization, copyright and staffing resources should not be overlooked. Though Reidy's paper is a decade old, the concepts are universal and valid over the years.

13. CONCLUSION

Just as water fallen from the sky goes to the sea, it does not matter which platform or technology is used to information service deliveries, but the ultimate goal is to reach the user at the earliest possible time whether he/she is in the library or in remote place. As Fryk (2009) mentioned, there are many rewards and promising benefits from digital resources looking from the customers' perspectives. As the current demand is moving towards electronic resources, libraries need to adopt newer and appropriate technologies to make resources accessible by users through networks. They need to

satisfy the major stakeholders by providing relevant and responsive services by putting partnership at heart of service deliveries. Further, they need to ensure that the services are managed efficiently. Though digital resources and remote access are the need of the day, it is not an easy task to develop repositories from scratch in any organisation. The institutions face many dilemmas, difficulties and deficiencies while creating the same. Adequate funding, infrastructure, selection of appropriate technology, hiring or training skilled manpower and copyright clearance are the important issues that need to be addressed by institutions and libraries while venturing into creation of digital repositories. Creation of a system is not a fad, but a commitment from the top for its sustainability. Hence, the authorities need to develop the systems scientifically and provide the necessary support for its sustainability/consistent operations. Once the system is established, it is easy to expand or build on the structure. As in the Jataka tales, real hard work with good intention will definitely yield good results and the beneficiaries will become satisfied customers.

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CHANGING
DIGITAL ENVIRONMENT AND LIBRARY SERVICES

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1. INTRODUCTION

We are living in the midst of an information revolution. Information and Communication Technology (ICT) has influenced each aspect of human endeavour. A major consequence of this development has been the concept of the emergence of electronic services in libraries or the concept of digital libraries. A digital environment is a simulated "place" made through the use of one or more computers.

Libraries and information services face many challenges from changes in the information environment, most of which have occurred as a result of developments in electronic information resources and the evolution of the "digital age". The evolution of the "digital age" has brought profound changes in the library and information services environment. So libraries and library staff must be ready to face new challenges, and acquire procedures to manage organisational change.

Library services are assuming a different dimension in philosophy, model and information delivery. Information acquisition, organization and delivery had shifted from the traditional system to electronic and web-based formats. Traditional collections are giving way to if not total but at least hybrid collections. This requires a new set of competencies built on traditional values. The role of a librarian has changed due to the IT appearance in the educational system. Libraries must move from institutionalized resource centered to network based. The change in the nature and roles of libraries in the digital environment has equally brought about the need for the development and acquisitions of new skills and competencies. This development again has been greeted by scarcity of experienced library staff that could meet the new demands. Without well-educated digital librarians, digital libraries cannot reach their full potential.

However the traditional function of a library of being the place where people come to get information and to learn will continue but it will not be considered by physical boundaries.

There are views that libraries must undergo a revolution and should change their services and functions in response to this new environment. But the challenges facing libraries in the digital environment do not require a revolution rather; libraries can meet those challenges with traditional strengths.

Information and knowledge are the high-value tools of the present age. The rise of the Internet has led to 'free information services' which means information to be available without cost using the Internet. The libraries and library staff need to adapt swiftly to the new learning environment. The digital era has revolutionized the methods for the organization and automated handling of information. The web documents are significantly different from traditional versions in their presentation and also the ways to organize and retrieve them. Libraries should plan and raise their services to where users require most rather than becoming too limited or denying users the chance to learn in modern environment using virtual reference service. Manpower is one of the three main components of reengineering process of library.

2. CHANGING ENVIRONMENT AND CHALLENGES FOR LIBRARY AND INFORMATION SERVICES

These various developments have had an impact on and have provided new challenges for library and information services.

Developments in Information Technology: Developments in information technologies and advances in telecommunications have revolutionised the worldwide information society. Access to information, via the Internet, is now everywhere. New techniques have facilitated the rapid transformation of data, information and knowledge into digital form. As a result, there have been significant changes in the ways in which documents and information are input, stored, organised, accessed and retrieved.

Challenges for Library and Information Services: Developments in new technology means users are able to access information via local and global networks, so that fewer visits are being made to libraries. Digitisation enables the information to be delivered in electronic form, and users are reluctant to use physical materials, perceiving the Internet to be the answer to all their informational needs. The library now has many competitors in respect of information services but end-user access requires training and real time support, and expert database searches demand subject knowledge. There is still a place for trained information professionals.

Changing Educational and Learning Environment: Changes in society, culture, the economy and technology have generated corresponding changes in education. Lifelong learning has become the norm. Education is universal right and a need, as well as a prerequisite for success. Continuing education is needed to maintain employment prospects in an increasingly competitive workplace. According to national knowledge commission library is the gateway to knowledge.

This changing learning environment is affected by technological innovations through a greater participation in the learning process. The 24-hour networked classroom has led to the evolution of the "virtual library", which provides a high level of support for the demands of this new kind of learner.

Challenges for Library and Information Services: Lifelong learning requires that varying levels of informational materials be available to user's at all different stages of the learning process. Restricted access to either the physical library or its networked resources will exclude potential users.

The increasing diversity of users will require wider subject specialisation on the part of information workers. In addition, the development of hybrid and virtual libraries means librarians must acquire new competencies and skills. Libraries will not become redundant, but they will change, and the role of the librarian must change with them. Advances in electronic communication may reduce the user's dependence on the traditional library.

Changes in Scholarly Communication: The evolution of a new pattern of scholarly communication via electronic publishing has made access to information easier and faster, facilitated communication among colleagues engaged in the creative process, and promoted more direct contact between scholars and their readers.

Changes in Information Needs of Users: Information environment is marked by a rapidly changing information user. The Web has changed user's needs for information delivery systems. Firstly, users want access to information. They want a search engine, to retrieve full range of information they require. They want Web portals that connect a variety of information sources and deliver content in response to a single query.

Second, they expect those searches to retrieve information regardless of its level of granularity. They want search engines that will go deep into the content of an electronic publication to pull out the information being sought. They do not want their searches to be limited to textual materials. Users want resource discovery systems that will also cover non-textual resources such as images and data.

In addition, users want to be able to personalize their information services on the Web.

Finally, users want information to be available on demand without any delays between its publication and availability to the user of an information system.

Basically what users require of information providers is interoperability i.e. the ability to connect a broad range of resources in a variety of formats and to make all those resources accessible from information environment as soon as they are published.

Challenges for Library and Information Services: Users are prime factor for a library. To satisfy user's need is the main objective of a library. With traditional tools we cannot satisfy our present users. They want quick delivery of information on remote terminal. Library should satisfy users without delay. No library is self sufficient. A library however big it may be cannot fulfill all information needs of all its users. This is a challenge for modern library how to bring users and their required information together.

3. RESPONSES OF LIBRARIES

Responses to Developments in Information Technology: Developments in information technologies have brought libraries the need to be innovation-driven and customer-oriented. With the development of electronic and digital collections, libraries have been transformed from a physical entity through hybrid operations to the virtual library.

Useful information resources are being selected via the Internet, organised and made easily accessible to the user. The Libraries have an extensive collection of Internet resources pages, maintained by professional staff, as well as a comprehensive library of electronic resources of all kinds.

Librarians are now also being trained to provide deeper subject knowledge. They are in the forefront of support for new technological innovations and are actively involved in collaborative digitisation projects.

Responses to the Changing Educational and Learning Environment: Libraries are adapting to the changing educational and learning environments by making the library fully accessible both in physically and electronic networks, and by providing support for remote users on a 24-hour basis. By building a user profile database they can develop a collection that reflects the needs of the whole community and that can attract all social groups. By acquiring information in the appropriate formats today library can cater to users at different levels of learning in different subjects. By develop co-operative online learning and educational programmes, libraries are also initiating partnerships to facilitate consortia funding aids and train staff to manage changes in the learning environment.

Responses to Changes in Scholarly Communications: Libraries are increasingly subscribing to e-journals to attract users. Some e-journals are free, and sometimes subscription to the print version generally includes free online access. Many libraries now have a policy of keeping e-journals rather than the print version. Some libraries, some print subscriptions have been cancelled as less-expensive electronic options became available.

Libraries have taken step to improve cost-effectiveness by sharing resources, for example, by organising co-operative acquisition of scholarly publications. Some have created an electronic forum for scholarly publishing in all subjects and have made it accessible both within the parent organisation and to outside academics. The smooth dissemination of information has been further improved by the strengthening of librarians' skills in dealing with copyright and in negotiating with publishers.

Responses to changes in information needs of Users: The expectations of today's users raise the bar for libraries. Libraries are operating in an environment of rapid change which demands the capability for rapid response. As libraries have limited budget they can meet these challenges mainly because of

three things that are the particular strengths of libraries i.e. selection, organization, and cooperation.

Strategies for the management of change in library and information services in digital era.

In order to implement change, the library needs to develop a strategic plan. In order to create a sense of unity within the organisation, libraries need to alter their management style encouraging participation at all levels, and empowering the staff through representation. Management must describe the reasons for change, specify the expected benefits and answer any questions that the staff might have and encourage their participation in the process. Standards and targets are to be set. Management must award for outstanding performance and should make change a continuing process using different approaches.

Impact of change on the organisation and on staff should be determined before implementation of change. Changes may be made in workflow, in distribution of tasks, in adoption of technology etc. Possible negative reactions may include fear of the loss of predictability in their work. There may be a reluctance to learn a new skill. However, there may also be positive reactions, such as increased job satisfaction, the fulfilling of ambitions, improved career development, leading to a better understanding and enabling staff to perform better and to cooperate and interact more effectively.

4. IMPLEMENTATION OF CHANGE IN DIFFERENT AREAS

The implementation of change involves a number of areas like, in the organisational structure, technology used, in the nature of the functions and in its employees.

Organisational Structural Change: Previously activities were carried out by top management but in present scenery management is led by teams. It ensures that all staff is required to lead, think and do. Ineffective systems hinder potentially effective people. Library staff would prefer the best way to communicate their suggestions for improvements and solutions to problems would be via online discussion groups. Communication in the changing organisation is by means of horizontal rather than vertical interactions, so that instant communication networks are available to staff at all levels. They should facilitate effective, productive and empowering communication.

Technological Change: Technological changes in libraries and information services will include the designing of a Web-based system and incorporated with the parent organisation. Users in remote terminals can access the library. They can be provided library service at their home. Such a system would enable each user to develop a personal digital library consisting of downloaded materials that would also be available to other users; it may include a librarian's desk that allows the users to communicate directly with the librarian to handle their particular informational need.

Functions Changes: A number of changes will also take place in the tasks carried out in library and information services. Information can now be supplied electronically using e-mail, image processing, online databases and e-journals. Online book recommendation service may be linked with the acquisitions department for both staff and students.

Now much library work is outsourced, book selection is made via approval schemes, library Web pages designed by professionals in the field, IT development handed over to the organisation's computer centre, and databases developed in collaboration with various institutions. Some cataloguing operations at the Libraries are outsourced. Training can be given to staff by external organisations. Job design and specifications are also changing from narrow responsibilities to broad. A staff development committee should be set up at the libraries. Library staff should be provided with the support they need for personal and professional development.

Staff Changes: Oganisational change involves people; it starts and ends with them. Staff needs to be dedicated to the mission and objectives of the organisation, and to work collaboratively in a supportive and cooperative manner. Library employees to have their part to play in providing services

in digital environment. They need to accept change as an opportunity rather than a threat. To these employees, achievement is the motivation for excellence in performance. They must be able to work well under pressure, and to work in collaboration with other members of the team, their primary goal should be satisfying the users. These people oriented changes in library and information services will lead to redesigning of the human resource system. There is requirement of people with ICT skills to provide digital library services.

The satisfaction of users rather than management must now be taken into consideration, and staff performance should be evaluated. The changing information organisation must provide target, standards for productivity, user satisfaction, effectiveness in communications, and so on.

5. CONCLUSION

Managing digital information resources requires an organization that is both flexible and technologically sound. A library stepping towards digital information must first and foremost have a vision of what it wants to be and whom it intends to serve. It must also have a strategic plan for accomplishing that vision. That strategic plan should be broad enough to accommodate a range of partnerships that can work together to achieve their common goals.

The management of change in the digital environment can be summarised as follows. First, decide what needs to be changed. Analyze why changes need to be made and setting objectives. Next, asses impact of change, which will be affected and to what extent. Finally, engage the commitment of others by involving them in the process, whether that involves individual, cultural or organisational change. Commitment and a willingness to adapt to the changing information environment will help to ensure the survival of library in the digital age. Libraries have to respond to a rapidly changing environment. New technologies and new needs have to be met. Libraries have sought to resolve some of these difficulties by spending more effort to develop resource sharing and turning to new kinds of information delivery services.

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SERVICES IN DIGITAL ENVIRONMENT

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1. INTRODUCTION

The IT has almost converted the whole world into a global village. The revolution in the IT sector is influencing the information industry at its peak and revolutionized the concept of libraries where it has been used extensively to record, store and disseminate the information in the digital form. A twenty first century library if not at all digitized, has at least a section devoted to accessing the growing collection of computer readable materials, the subscribed bibliographic and full text database, E-Journal, etc. for the end user. Along with the access of the subscribed databases it also provides the Internet browsing and searching, E-Mail, Chat, Video Conferencing facilities to the user. Sometimes it also provides OPAC terminals. The downloaded articles can be printed upon request. Back issues of selected journals and newspapers are also available in some library as microfiche or microfilm, with readers and printers provided for access. All these collection together constitute the digital library. A digital library is nothing but a large database of organized collection of multimedia, data that are globally available directly or indirectly across a network and eventually act as a portal site providing access to digital collections held elsewhere for the people who are working on hypertext environment.

2. WHAT'S DIGITAL ENVIRONMENT

All data that a computer processes must be encoded digitally, as a series of zeroes and ones. Today, digital is synonymous with computer. A digital environment is a simulated "place" made through the use of one or more computers. Records or evidence of an individual's interaction with a digital environment constitute their **digital footprint**. Since the late 1980s, it has become accepted wisdom that we are living in a 'digital environment', one that embodies a 'law of code' (a law founded on US libertarian values regarding free speech and private enterprise) that will bring nations - and individuals - together in a global market featuring ubiquitous access to information via electronic media. Digital environment provide a facility to perform many routine tasks such as checking opening times, booking a library computer, browsing our catalogue as well as reserving or renewing books online from any computer.

3. NEED FOR A DIGITAL ENVIRONMENT

Libraries are needed a digital environment to provide quality based service at the user desktop.

- *Shifting of the Environment*: The new generation user becomes only happy when they will be able to read from the computer screen. The new generation whose demand for information is never met demands that traditional libraries should be developed as a well equipped and interconnected DL.
- *Easy to Understand*: The visual or graphical information system of digital libraries is more popular as compared to text based information system.
- *Multiple Function of Same Information*: In case of digital libraries by using hypertext it is possible to structure and organize the same digital information in a variety of ways which serve multiple functions.
- *Information Explosion*: Somehow the digital library is expected to be able to handle the problem of information explosion somehow. It will be able to handle and manage large amount of digital

content by simply providing link, without actually procuring the document.

- *Searching Problem in Traditional Libraries:* By using digital library one will be able to retrieve information specifically for e.g. a particular image, photo, a definition, etc.
- *Distance Learning*: Time is a major factor for each modern user of the library which is otherwise spent in coming and going to the library, but digitization will facilitate learning from home, office or other places which are convenient to users.
- *To Provide Access to Online Publication*: As more and more information are published over internet, digital library needs to procure and provide link to the online publication and other important sources of information.
- *Limited Buying Power of Libraries:* The collection of every library is limited to only a fraction of the total. Introduction of digital library will help to enhance the collection considerably.
- *Storage Problem in Traditional Libraries:* Libraries are spending much of its budget by way of maintaining the collection in a usable form that also demands a huge physical space. Digitization hopes to overcome this. Digital Medias comes with a huge storage capacity.
- *Low Cost of Technology:* The cost of technologies is much more less than that of traditional libraries.
- *Environmental Factor:* The use of digital libraries is one of the cleanest technologies to fulfill the slogan "Burn a CD-ROM save a tree".

4. ADVANTAGES OF THE DIGITAL SERVICE

In digital environment, library is not confined to a particular location or so called building, it is virtually distributed all over the world. The user can get his/ her information on his own computer screen by using the internet. Actually it is a network of multimedia system which provides finger tip access. The spoken words or the graphical display of a digital library is again having a different impact from the words that are printed. In the new environment owning a document will not be problem for the library because the user will pay for its uses.

- *No Physical Boundary*: The user of a digital library need not go to the library physically; people from all over the world could gain access to the same information, as long as an Internet connection is available.
- *Round the Clock Availability*: Digital libraries can be accessed at any time, 24 hours a day and 365 days of the year
- *Multiple Accesses*: The same resources can be used at the same time by a number of users.
- *Structured Approach*: Digital library provides access to much richer content in a more structured manner i.e. we can easily move from the catalog to the particular book then to a particular chapter and so on.
- *Information Retrieval*: The user is able to use any search term bellowing to the word or phrase of the entire collection. Digital library will provide very user friendly interfaces, giving clickable access to its resources.
- *Preservation and Conservation*: An exact copy of the original can be made any number of times without any degradation in quality.
- *Space*: Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain them. When the library had no space for extension digitization is the only solution.
- *Networking*: A particular digital library can provide the link to any other resources of other digital library very easily. Thus a seamlessly integrated resource sharing can be achieved.
- C*ost:* The cost of maintaining a digital library is much lower than that of a traditional library. A traditional library must spend large sums of money paying for staff, book maintenance, rent, and additional books. Digital libraries do away with these fees.

5. RESOURCES TO PROVIDE SERVICES

The resources to providing services in digital environment are those, which the computer can store, organize, transmit and display without any intervening conversion process. The resources of a library mainly consist of e-book, v-book, electronic tax, map, image, sound, and video. The digital material may be of multimedia types or any other i.e. only digital audio, video, full text information, photograph, drawing, digitized sound, 3D representation, etc. The collection may include structured /unstructured text, scanned images, graphic audios, video recording, etc. In the digital environment anyone who has access to the internet can be a publisher by merely posting messages to an online discussion group or other, so digital libraries' collection should also be enhanced with links to such resources.

- *On line Resources:* Local database of traditional books in machine-readable form, E-book, v-book, electronic tax, map, image, sound, video, and multimedia, E-journal, etc.
- *Off line Resources:* C.D-ROM, Juke Box, etc.

6. ACQUISITIONS SERVICES

Acquisitions are responsible for ordering and receiving all material purchased for the Library collection. Materials include books, periodicals, videos, cd-roms, online databases, microfiche, and microfilm. We maintain subscriptions and standing orders for serials and periodicals and also provide book approval programs for several academic departments. General Areas of Operations Managed by Acquisitions:

- Library resources budget for all libraries
- Purchase and receipt of library materials
- Approval plans, continuations, subscriptions and memberships
- Digital resources trials, license, lease, access and site administration
- Alumni Memorial Books Program (AMBF), and Non-Memorial Gift Books Program - **AMBF Brochure** (Word Doc.)
- Fund, statistical and other management reports
- Catalog materials on receipt

7. CIRCULATION SERVICES

In digital environment, a library provide a service of 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.

8. ONLINE CATALOGS

Online cataloging, through such systems as the Dynix software developed in 1983 and used widely through the late 1990s, has greatly enhanced the usability of catalogs, thanks to the rise of MARC standards (an acronym for MAchine Readable Cataloging) in the 1960s. Rules governing the creation of MARC catalog records include not only formal cataloging rules such as AACR2 (Anglo-American Cataloguing Rules, Second Edition) but also rules specific to MARC, available from both the U.S. Library of Congress and the OCLC, the Online Computer Library Center global cooperative which builds and maintains WorldCat. MARC was originally used to automate the creation of physical catalog cards, but its use evolved into direct access to the MARC computer files during the search process.

OPACs have enhanced usability over traditional card formats because:
- The online catalog does not need to be sorted statically; the user can choose author, title, keyword, or systematic order dynamically.

- Most online catalogs allow searching for any word in a title or other field, increasing the ways to find a record.
- Many online catalogs allow links between several variants of an author's name.
- The elimination of paper cards has made the information more accessible to many people with disabilities, such as the **visually impaired**, **wheelchair** users, and those who suffer from **mold allergies** or other paper- or building-related problems.

9. LIBRARIAN IN DIGITAL ENVIRONMENT

Though the digital environment is built as a system which can be used by its ultimate end user directly from their desk top PC but the role of librarian cannot be overlooked. In digital environment also the librarian and information scientist will be needed for packaging and repackaging of information, for electronic publishing, for reference purpose, to advice the user about the strategy to identify relevant electronic sources, etc. Thus the librarian will be more or less a hypertext engineer. In the new environment it will be very difficult for the librarian to decide what should be organized; how to give citation; how to organize the collection; etc because the new environment will be really challenging one for the librarian to decide who the authors are, who the publishers are and who the users are?

10. REQUIREMENT OF LIBRARY MANAGEMENT SOFTWARE

To create a digital environment, we have a requirement of library management software. These library management software provides centralized management and processes for different types of libraries and library activities such as acquisition, cataloguing, circulation, administration, reporting and patron records. It provides integration of self-service and online web portal access for catalogue search, content delivery or reservation requests and such others. They also track and automate notification of overdue books and fines. These are followings.

- *Automatización de Bibliotecas y Centros de Documentación (ABCD):* ABCD stands for "Automatización de Bibliotecas y Centros de Documentación" (Spanish), which means: Library and Documentation Centers Automation. It is able to manage acquisitions, management of bibliographic databases, user management, loan management, control of periodicals, and so on.
- *DEL-PLUS:* This software was designed and developed by Developing Library Network (DELNET), New Delhi. It is able to manage the acquisition, cataloguing, circulation, and administrative work of the library. It also has an OPAC end and follows internationally recommended standards and formats such as MARC 21. It is suitable for small and medium size libraries which have collections upto one lakh holdings. It also supports Barcode.
- *E-Granthalaya:* e-Granthalaya is library automation software from National Informatics Centre, Department of Information Technology, Ministry of Communications and Information Technology, Government of India. Using this software the libraries can automate in-house activities as well as user services.
- *Evergreen:* Evergreen is an open source library management software, freely licensed under the GNU GPL. It was first launched in September, 2006 in Georgia's PINES consortium. It is highly-scalable software for libraries that helps library patrons find library materials, and helps the libraries to manage, catalogue, and circulate those materials, no matter how large or complex the libraries.
- *FireFly:* FireFly is a Complete Public Library system. It is being written in Python, Perl, with all data being stored in XML. The driving force behind this project is to give public libraries a Free-Software set to run and maintain library systems.
- *Koha:* Koha is the world's first open-source Integrated Library System (ILS) and it is distributed free of cost (open source, and so no license fee, ever). It runs on Linux, Unix, Windows and MacOS platform. Koha is a comprehensive system that has the capacity to intelligently run a library, large or small, real or virtual. Koha is compliance with copy cataloguing and z39.50, MARC21 and UNIMARC for professional cataloguers.
- *Library Information and Management System (LIMS):* LIMS is a unique library system, designed,

developed, implemented and fully tested by library professionals. It is distributed free of cost to the libraries.

- *Library Manager:* Library Manager is library management software. It has been developed under GPL licence.
- *LibSys 7:* It is a web based library software product from Libsys Ltd., Gurgaon, Haryana. It has the modules for acquisition, cataloguing, circulation, serials, article indexing, Web-OPAC, and reports. It supports international standard like MARC21 (USMARC + CANMARC), Unicode, SRU-SRW, Z39.50, NCIP-NISO, SICI-Barcode.
- *NewGenLib:* NewGenLib is an integrated library management system developed by Verus Solutions Pvt. Ltd. Domain expertise is provided by Kesavan Institute of Information and Knowledge Management in Hyderabad, India.
- *OpenBiblio:* OpenBiblio is an easy to use, automated library system written in PHP containing OPAC, circulation, cataloguing, and staff administration functionality.
- *Sanjay:* The NISSAT sponsored a project to DESIDOC for developing programmes on UNESCO's CDS/ISIS for enabling a library to do acquisition, circulation, etc. DESIDOC has successfully modified the programmes and a new package based on CDS/ISIS was released in 1992 by the name of SANJAY. So, Sanjay is an augmented version of CDS/ISIS with modules prepared for the various housekeeping operations. The software is totally menu driven and works in windows environment with LAN support. In India, NISSAT is the marketing agent of this software.
- *Small Library Organizer Pro:* It is complete software for small private, public, or corporate libraries. It able to manages all the library collections, member / patron information, and keeps track of the library circulation data. The package has a separate module called Designer. With Designer one can modify Small Library solution or can build their own. This is a freeware.
- *SOUL 2.0:* Software for University Libraries (SOUL) is the state-of-the-art library automation software designed and developed by the INFLIBNET Centre, Ahmadabad. It is user-friendly software developed to work under client-server environment. Looking at the name of the software, one may think that it is meant for the university libraries only, but, in fact, it is flexible enough to be used for automating any type or size of library.
- *WEBLIS:* WEBLIS is a free-of-charge Web based Library Integrated System based on CDS/ISIS. The system has been developed by the Institute for Computer and Information Engineering (ICIE), Poland. The current version of WEBLIS, available in English, consists of the cataloguing system, OPAC (search), LOAN module, and statistical module. WEBLIS runs through the WWW-ISIS engine.

11. CONCLUSION

Digital environment make a library more powerful than a tradition library. In digital environment, libraries are not going to replace the physical existence of document completely but no doubt to meet the present demand, to satisfy the non local user digitization must be introduced so that at least libraries becomes of hybrid nature. The initial cost of digitization is high but experiment shows that once digitization is introduced then the cost to manage this collection will be cheaper than that of any traditional library. Day by day the cost of digitization is also decreasing, the online publication is increasing, the need of users are shifting towards a different environment so it is needless to say that after one or two years all library will shift over to digital mode, if not fully at least to some extent. So it is the pick time to all library and informational science professional to gear them in building digital library and taking it as a challenge. Large scale digitization projects are underway at Google, the Million Book Project, MSN, and Yahoo!. With continued improvements in book handling and presentation technologies such as optical character recognition and e-books, digital libraries are rapidly growing in popularity. By continuing to build on these strengths libraries will find themselves well equipped to deal with the information revolution.

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SEMANTIC WEB IN LIBRARY SERVICES

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1. INTRODUCTION

The semantic web is a collaborative movement led by international standards body, the World Wide Web by encouraging the inclusion of semantic content in web pages. The www contains huge amount of information which can be easily accessed by specifying URL addresses, search engines and following links to find other related resources. The enormous amount of data has made it increasingly difficult to find, access, present and maintain the information required by a wide variety of users. It is very easy to get, lost or discover irrelevant and unrelated information because information content is presented in natural language. For this problem, a support is essential for bringing the web to its full potential. Tim Berners-Lee, the inventor of the www, put forward the concepts of meaningful web or semantic web. The semantic web aims at converting the current web, dominated by unstructured and semi structured documents into a web of data.

2. CONCEPT

The semantic web indicates that the meaning of data on the web can be discovered not just by people also by computers. According to Tim Berners –Lee (1998), the word semantic means 'machine-possible'. Tim Berners-Lee(2001) describe the semantic web, "as extension of the current web in which information is given well defined meaning, better enabling computers and people to work in co-operation". According to W3C, "The semantic web provides a common framework that allows data to be shared and reused across application, enterprise and community boundaries. In the semantic web data itself become a part of the web and is able to be processed independently of application platform or domain

3. IMPORTANT FEATURES OF SEMANTIC WEB

The semantic web comprises the standards and tools of XML (Extensible Markup Language), XML Schema, RDF (Resource Description Framework), RDF Schema and OWL (Web Ontology Language).

Two important technologies for developing the semantic web are already in place: Extensible Markup Language (XML) and the Resource Description Framework (RDF).

XML lets everyone create their own tags hidden labels such as <zip code> or <alma mater> that annotates web pages or sections of text on a page.

Meaning is expressed by RDF which encodes it in sets of triples each triple being rather like the subject verb and object of an elementary sentence. These triples can be written using XML tags.

In RDF, a document makes assertions that particular things (people, web pages or whatever) have properties (such as "is a sister of," "is the author of") with certain Values (another person, another web page). This structure turns out to be a natural way to describe the vast majority of the data processed by machines.

Subject and object are each identified by a Universal Resource Identifier (URI), just as used in a link on a web page. (URLs, Uniform Resource Locators are the most common type of URI.)

4. COMPONENTS OF SEMANTIC WEB

XML (Extensible Markup Language): The basic building block of semantic technology is the use of Extensible Markup Language (XML) which permits the use of tags to describe objects [24]. It is a markup language much like html and was designed to carry data not to display data. XML tags are not predefined so one can define or create his/her own tags hidden labels such as or that explain web pages of sections of text on a page, but it says nothing about what the structures mean. XML is particularly suitable for sending documents across the web.

RDF (Resource Description Framework): RDF is a framework for describing resources on the web. It describes a resource the resources properties and the values of those properties, often referred to as triples that consist of a subject, predicate, and object. It is particularly intended for representing metadata about the resources, such as title, author and modification date of a web page, copyright and licensing information about a web document (or information resource published on the web), or the availability schedule for some shared resources. RDF presents the syntactic structure whereby we can express information about the resource in form of XML statements. For example we want to say that the title of the webpage http://www.caluniv.ac.in is University of Calcutta Homepage. This will be expressed in RDF as: http://www.caluniv.ac.in has title whose value is University of Calcutta Homepage.

Ontology Web Languages (OWL): The term ontology has its origin in philosophy, and has been applied in many different ways. Ontology is a formal representation of knowledge as a set of concepts within a domain and the relationships between those concepts. It is used to reason about the entities within that domain and may be used to describe the domain ontology are the structural frameworks for organizing information and are used in artificial intelligence, the semantic web, systems engineering,

Software engineering, library science, enterprise book marking and information architecture as a form of knowledge representation about the world or some part of it. The creation of domain anthologies is also basic to the definition and use of an enterprise architecture framework.

5. ONTOLOGY AND TAXONOMIES IN THE SEMANTIC WEB: HOW LIS AND COMPUTER SCIENCE NEEDS TO JOIN FORCES TO MAKE THIS HAPPEN

LIS and cataloguing professionals are not only familiar with these concepts, as they often form the core of their work and part of the educational curricula. The traditional skills of librarianship - thesaurus construction, metadata design and Information organization - are deeply important in the creation of this next stage of web development. Ontology Web Languages (OWL) facilitates greater machine interoperability of web content than that supported by XML, RDF and RDFS by providing additional vocabulary along with a formal semantics. It can be used to explicitly represent the meaning of terms in vocabularies and the relationships between those terms. OWL adds more vocabulary for describing properties and classes: among others, relations between classes (e.g., disjointness), cardinality (e.g., exactly one), equality, richer typing of properties and characteristics of properties (e.g. symmetry), and enumerated classes. Thus semantic web ontology consists of taxonomy and a set of inference rules from which machines can make logical conclusions.

6. SIMILARITIES BETWEEN THE LIBRARY AND THE SEMANTIC WEB

The "Internet [Web] has been described as a library with all the books tossed on the floor" [21] or

"the Web is like a virtual library" the latter statement marshals little support when considering the full scope and anarchy of the web. The semantic web part of the larger web is however quite similar to the library for the following reasons:

- The library and the semantic web have mission statements grounded in service, information access, and knowledge discovery.
- The library and the semantic web have advanced as result of international and national standards.

Missions grounded in service, information access and Knowledge discovery: The library's definitive goal is to support knowledge discovery for advancement of citizens and society. The semantic web's homepage provides a succinct definition of the semantic web that is characteristic of a mission statement. The semantic web provides a common framework that allows data to be shared and reused across application, enterprise, and community boundaries. The statement highlights such components as a common framework, shared data (information) and collaboration and it parallels the library's standardization and sharing of bibliographic data, resource circulation and collaborative activities. The semantic web's overriding goal to imbue computer and human agents with intelligence which is very similar to the library's goal of advancing knowledge.

Advancement via International and National Standards: The library community's response to the increased amount of information has also led to development of cataloging codes formalized classificatory and verbal systems; and encoding communication standards (International Bibliographic Description (ISBD) and Machine Readable Cataloging (MARC). The web and digital library growth has also motivated rethinking and revision of cataloging standards, models, and codes, as evidenced by the development of the many metadata schemes, Functional Requirements for Bibliographic Records (1998) [11], and Resource Description and Access (RDA). The Semantic web has followed a similar path as evidenced by a collection of information standards: extensible Markup Language (XML), RDF, OWL, Friend of a Friend (FOAF) and Simple Knowledge Organizations System (SKOS).

7. APPLICABILITY OF LIBRARY FUNCTIONS TO THE SEMANTIC WEB

This section discusses the goals and objectives of the four primary functions underlying the modern library. The discussion also explores the applicability of each function to the semantic web based on the above analysis of library and semantic web similarities.

Collection Development in the library: The collection development is it to build and maintain a various collection that services a designated constant patron population. The activities of collection development policy that viewed as a contract between the library and users.

Collection development policies document the library's intent to grow the collection, identify collection strengths and limitations, and guide library staff, particularly bibliographers, in their collection development work. Guidelines also include selection criteria about preferred subjects and formats. Collection development policies are not permanent, rather they need to be reviewed and revised, as user populations' change and present new demands. Finally, collection development can help libraries with administrative activities by including procedures for acquisitions, gifts, weeding, replacing lost items and collection evaluation.

Library Cataloging: The purpose of cataloging is to make library collection materials findable and discoverable so they can be used. Charles A. Cutter's (1904) objectives for a library catalog, printed in the 4th edition of his Rules for a Dictionary Catalog, are among the most influential statements impacting cataloging. Cutter's objectives state that a library should:

- Enable a person to find a book when the author, title, or subject is known;
- Show what the library has by author, subject, and literature genre; and written a century before the development of the web, Cutter's objectives are still applicable to library operations today, and

thus influence current cataloging activities.

Jumping a century beyond Cutter to today, digital resource cataloging (metadata creation) is being guided by principles and objectives documented in a variety of metadata schemes. Under development are the Rules for Description and Access (RDA), which includes a draft statement of objectives (RDA) Semantic Web "semantic" representation

Similarities between library cataloging and producing metadata for the semantic web, both are deal with representation. In fact, the boundary between the employ of representation standards in these two environments (libraries and the semantic web) is artificial. Rather the representation activity takes place along a continuum, with simple bibliographic representation for search and retrieval on one end, and the implementation of formal ontology and machine supported deductive reasoning on the other. Similar to the library's community extensive MARC documentation the semantic web provides comprehensive documentation for working with enabling technologies, such as XML, RDF, and OWL.

Semantic Web service: The attachment is with "reference service"— the central pillar of semantic web. The semantic web depends on standardized structured metadata and semantic web algorithms capable of reading and manipulating such data but the overriding goal is to provide service to free humans from routine tasks that computers can perform—and can perform effectively. Current semantic web services facilitate knowledge and service discovery and more sophisticated forecasted activities include automatic purchasing of an airline ticket.

8. A GAP BETWEEN SEMANTIC WEB AND LIBRARY

The semantic web and library communities are far from being healthfully integrated. On one side of this gap, the members of the semantic web community are not fully aware of the skills, talent, and knowledge that librarians (primarily catalogers) have, and which can help advance the semantic web. This is evident by the absence of a metadata representation working group within the World Wide Web Consortium (W3C), and the severely limited participation of professional librarians on various W3C working groups. Granted, the W3C's semantic web activity has focused more on the development of enabling technologies, rather than processes or activities. On the library side of the gap, librarians have been slow to embrace the semantic web and work with semantic web enabling technologies and standards in comparison to the way in which computer scientists, engineers, and oncologists. Now a day's real time and instant processes like blogs, email, websites and instant massaging are placed to disseminating of information via web on library.

9. CONCLUSION

The library & the semantic web cultures devoted to increasing information access & knowledge discovery. It makes sense to explore the foundation of the library and consider what primary functions may help advance the semantic web initiative. The library has been societies chief information custodian for the last several hundred years, and if the semantic web is to evolve into a chief and trusted information network affording services and performing tasks for both humans and machines and need to examine the applicability of the libraries primary functions to the semantic web.

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PERFORMANCE AMONG NIT LIBRARIES IN INDIA WITH RESPECT TO RESOURCE FACILITIES

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1. INTRODUCTION

Libraries are central, intellectual and integral part of academic life. Primary objective of the academic libraries is to serve patrons (faculties, students, researchers and staff) to meet their current teaching, learning, research and innovation needs. Inherently, academic priorities and affinity to use and access library facilities are increasing irrespective of space and time. Therefore, the role of libraries in the academic set up is redesigned as patron knowledge workspaces for sharing academic and research ideas, information and experiences. Majority of academic libraries today are modernized, equipped, customised and ornamented with resource facilities such as computer and network infrastructure facilities, electronic resources, manpower, automation and service facilities etc. These facilities are interdependent and working together for growth and development of the academic libraries and they enhance the patrons' critical thinking, technical know-how and leadership qualities.

The trend of academic libraries becomes more open today. They are trying hard to make the academic system effectively than ever before in spite of their constrained role within a particular political paradigm (Carrigan, 1988). The way of storage, transmission and retrieval of information are different than traditional methods (Zhen, 1996). The cost and complexity of library automation may be at an all-time high, the opportunities for serving patrons are as never before (Breeding, 2006). Operations of the libraries have long been highly labor-intensive (Rush, 1982). Management of electronic journals cannot yet be considered trouble-free (Patra, 2006). Therefore, the academic libraries invest more on computer, networks and electronic resources to make use, store, and preserve information for the academic community. Infrastructure facilities and collection of resources alone do not make a library successful, need a library staff who are responsible for its use and fulfilling the objectives of the library (Devi and Singh, 2006). Moreover, services provided by the libraries through network are important. Essentially, there are two types of networked services one is local another one is remote. Firstly, the local NS are provided by local hosts (Abdullah & Gay, 1994). Secondly, the remote networked services are provided by remote hosts through Internet (Srinivasa Rao & Choudhury, 2010). Today, majority of academic libraries transpire as service-oriented segments and mostly fueled by their facilities. Transactions of the academic libraries are enhanced from man-assisting to self-service systems. Patrons able to access and use resources stored in the both local and remote places. They can browse and search catalogues, access databases, perform real-time interactions, avail electronic document deliver/inter-library loan etc.

Proportionately, resource facilities are most vital inputs that create conducive environment for meeting the best academic needs. Further, these facilities are not only increase speed and accuracy of the library activities, but also reduce work load of the staff, duplication of work and time. Indeed, multiple libraries facilities can have a strong impact on institutional outcomes. They help the patrons' in writing the lesson plans, grant proposals and research papers for fulfilling their academic achievements. They also help to promote academic and scientific progress and to improve the value and visibility of the institute. Therefore, this study was undertaken to map the resource facilities (CI, NI, ER, MA, LA and NS) available at various NIT libraries in India and their performance. In fact, these are indicating parameters for the NIT libraries growth and development.

2. OBJECTIVES OF THE STUDY

The main objectives of the study are:

- To evaluate performance among NIT libraries zone wise based on the resource facilities.
- To rank the NIT libraries individual
- To rank resource facilities individual and zone wise.

3. NATIONAL INSTITUTES OF TECHNOLOGY (NITS) IN BRIEF

NITs erstwhile Regional Engineering Colleges (RECs) are institutes of national importance established under the Act of Parliament 2007, Ministry of Human Resource Development, Government of India. At present, there are 30 NITs in India. These are benchmarking for technical education especially in the areas of engineering, science and technology.

4. SCOPE AND LIMITATION OF THE STUDY

The research study is confined only to 20 NIT libraries in India concerning their facilities (CI, NI, ER, MA, LA and NS). The survey was limited to the librarians of the concerned NIT libraries. Patrons' interview/opinions and their degree of satisfaction (i.e. patron survey) would have added more value to the present study.

5. METHODOLOGY

A methodology adopted for collecting data was questionnaire of survey-based. It was designed in structural form and framed into different sections and representing specific facets. It was remain the primary source for collecting data. Besides, the secondary and tertiary sources were consulted to explore related information. After obtaining the relevant data through the questionnaire, these were tabulated, represented and interpreted using multiple numerical scales (Table 1) such as with appropriate graphs to understand clearly and easily.

Table 1: Numerical Scales

Sl. No.	Factors	Scales				Score
		1 (Yes)	*1 – 2*	*1 – 3*	*1 – 5*	*100%*
1	CI	√	√		√	13
2	NI	√	√	√	√	20
3	ER				√	15
4	MA			√	√	13
5	LA	√	√	√		14
6	NS	√				25

6. PERFORMANCE AMONG NIT LIBRARIES

Performance measurement is the management approach defining indicators towards achievement of goals. The effect of performance is based on assessment, the quality and effectiveness of resources and services provided by a library. Performance measures are valuable and very difficult to assess them. O'Farrell (1998) quoted that one of the main reasons why university librarians are unwilling to commit to regular performance measurement exercises is the amount of staff time and resources that is involved in collecting the necessary datasets (Goodall, 1988). The perceived benefits of performance measurement do not justify the required inputs of staff time and energy, and therefore librarians will not dedicate staff to management information gathering (O'Farrell, 1998). In the competitive environment, the libraries adopt certain protocols and methods to measure their

performance. In fact, many projects (E-metrics, EQUINOX and Measuring the Impact of Networked Electronic Services (MINES for Libraries)) have worked out to indicate the performance measures for an electronic library system, resources and networked services. However, this study adopts few measures with respect to resource facilities among NIT libraries using multiple scales. Accordingly, the libraries were ranked based on their performance of resource facilities individual and group wise.

Table 2: Performance among the NIT Libraries – Zone wise

	Maximum Score		*13*	*20*	*15*	*13*	*14*	*25*	*100*		
Sl. No.	Zones	NIT Libraries	CI	NI	ER	MA	LA	NS	Total	Grand Total Score	Average
1	North	MNNIT Allahabad	12	17	8	6	12	11	66	301	60
2		NIT Hamirpur	11	17	13	7	5	10	63		
3		NIT Jalandhar	7	14	12	6	7	12	58		
4		NIT Kurukshetra	10	11	11	5	10	14	61		
5		NIT Srinagar	10	12	4	8	8	11	53		
6	East	NIT Durgapur	10	12	7	8	10	17	64	212	53
7		NIT Jamshedpur	7	13	5	6	6	13	50		
8		NIT Patna	6	12	1	3	4	3	29		
9		NIT Rourkela	8	16	8	6	11	20	69		
10	North East	NIT Agartala	3	12	2	3	4	2	26	93	47
11		NIT Silchar	10	14	12	7	9	15	67		
12	South	NIT Calicut	11	15	12	10	14	23	85	316	79
13		NIT Surathkal	10	15	7	9	14	19	74		
14		NIT Tiruchirapalli	11	16	15	7	11	21	81		
15		NIT Warangal	10	16	11	10	12	17	76		
16	West	MNIT Jaipur	8	12	8	5	7	15	55	194	65
17		VNIT Nagpur	7	12	9	7	11	19	65		
18		SVNIT Surat	11	15	13	7	12	16	74		
19	Central	MANIT Bhopal	8	9	10	9	6	9	51	79	40
20		NIT Raipur	5	15	1	5	1	1	28		

Table 2 shows zone wise performance of each NIT library. The South (79%) performs better than other zones, followed by the West and North zones with an average score of 65 and 60 respectively.

East, North East and Central zones have shown their performance at below average. It is therefore observed that lack of considerable amount of library facilities, resources and services the libraries shown poor performance at their end. The outcome of an individual performance has been presented in Figure 1.
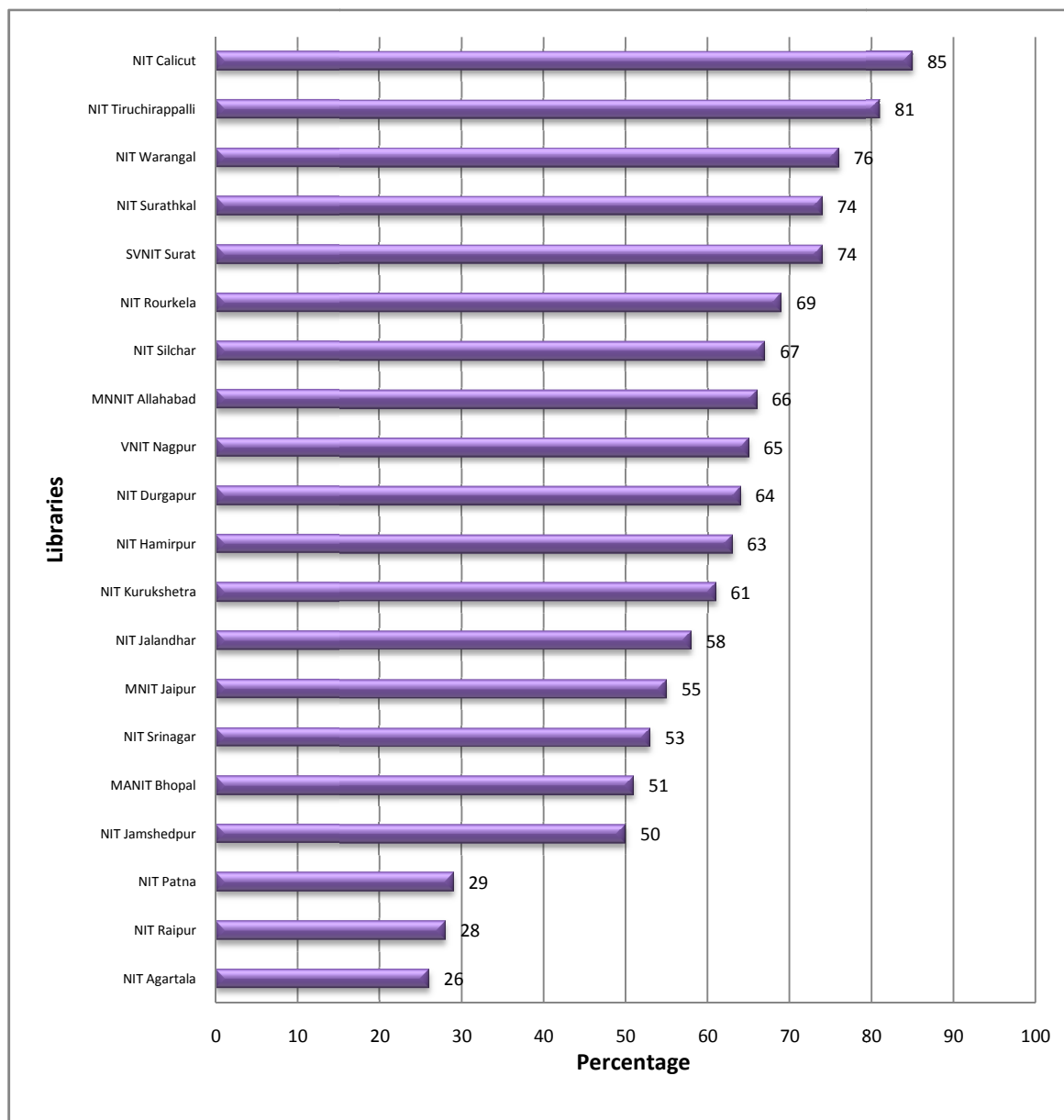

Fig. 1: NIT Libraries – Ranking

The Figure 1 shows the NIT Calicut holds at rank one ,whereas Tiruchirapalli and Warangal are at distant second and third. The Surathkal and Surat have similar performance holding at 4th and 5th positions, while the other libraries perform moderately except NIT Patna, Raipur and Agartala. From the findings it is clear that all 17 NIT libraries previously RECs have scored more than 50%, whereas three NITs (Patna, Raipur and Agartala) previously old government engineering colleges are at below average. Possibilities could be an education culture between RECs and old government engineering colleges or lack of infrastructure, resource and service facilities, managerial support, manpower, skills, funds etc. However, libraries are managing their resources and infrastructure facilities effectively.

7. RESOURCE FACILITIES INDIVIDUAL AND ZONE WISE PERFORMANCE

The study addresses the NIT libraries and their stand on an individual and group with respect to multiple facilities (CI, NI, ER, MA, LA, and NS) rendered by them. Each facility has its own functionalities to perform towards growth and development of the libraries. Here, the facilities are briefly described and interpreted results via tabulated form of pictography to know the positions of NIT libraries in India individual and zone wise.

8. COMPUTER INFRASTRUCTURE (CI)

Infrastructure is a fundamental and developmental tool that has many meanings according to Lakos (1997) the infrastructure is *physical components – hardware & software, various equipment, communication lines, etc.* In this study, the CI consists of hardware, software and electronic equipments (digital scanners, barcode scanners, printers, video players/recorders and television sets). The strength of CI facilities among NIT libraries is shown in Table 1.

Table 3: Compute Infrastructure Facilities @ NIT Libraries – Ranking

Libraries	Individual wise %	Zone wise
MNNIT Allahabad	92.31	
NIT Calicut	84.62	
NIT Tiruchirapalli	84.62	
NIT Hamirpur	84.62	
SVNIT Surat	84.62	
NIT Kurukshetra	76.92	
NIT Srinagar	76.92	
NIT Durgapur	76.92	
NIT Silchar	76.92	
NIT Surathkal	76.92	
NIT Warangal	76.92	
NIT Rourkela	61.54	
MNIT Jaipur	61.54	
MANIT Bhopal	61.54	
NIT Jalandhar	53.85	
NIT Jamshedpur	53.85	
VNIT Nagpur	53.85	
NIT Patna	46.15	
NIT Raipur	38.46	
NIT Agartala	23.08	

In terms of individual performance, the Table 3 indicates above 85% of libraries have very good computer infrastructure facilities whereas 15% libraries are at minimal. Concerning the zones, the South zone (81%) is ahead of others; followed by North (77%), West (67%), East (60%) zones and North East and Central zones are having 50% of each.

9. NETWORK INFRASTRUCTURE (NI)

Network is a common pool to exchange, transfer and provide information. Access to NI facilities could better communicate with patrons reside at both local and remote locations and able to collaborate with other external patrons and libraries etc. Concerning to NI facilities, this study encompasses of Local Area Network (LAN) whether it is a dedicated or a part of campus network, media used, spread of campus network, Internet connectivity and bandwidth etc.

Table 4: Network Infrastructure Facilities @ NIT Libraries – Ranking
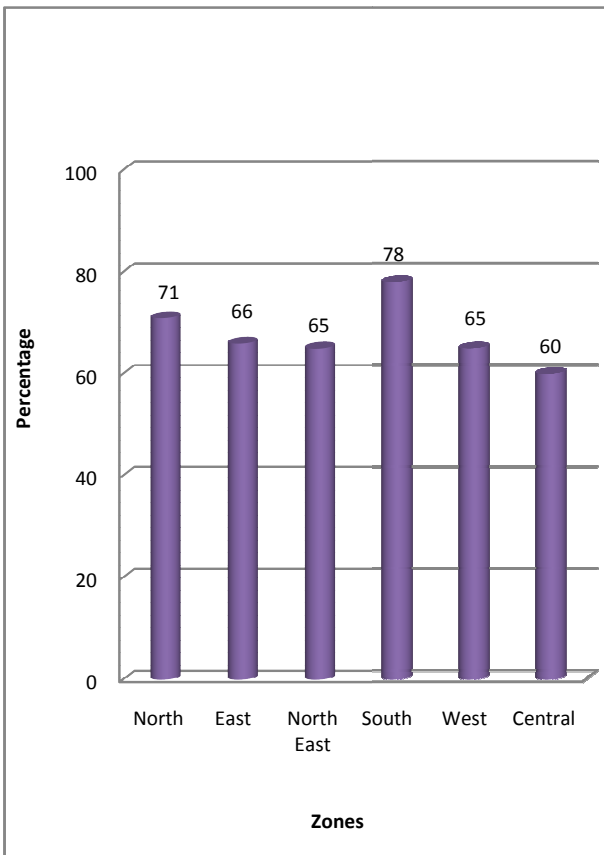
Libraries	Individual wise %	Zone wise
MNNIT Allahabad	85.00	
NIT Hamirpur	85.00	
NIT Rourkela	80.00	
NIT Tiruchirapalli	80.00	
NIT Warangal	80.00	
NIT Calicut	75.00	
NIT Surathkal	75.00	
SVNIT Surat	75.00	
NIT Raipur	75.00	
NIT Jalandhar	70.00	
NIT Silchar	70.00	
NIT Jamshedpur	65.00	
NIT Srinagar	60.00	
NIT Durgapur	60.00	
NIT Patna	60.00	
NIT Agartala	60.00	
MNIT Jaipur	60.00	
VNIT Nagpur	60.00	
NIT Kurukshetra	55.00	
MANIT Bhopal	45.00	

Zone wise chart: North 71, East 66, North East 65, South 78, West 65, Central 60 (Percentage vs Zones).

Table 4 indicates that almost all NIT libraries have relatively similar NI facilities at both individual and group wise performance. However, the South zone (78%) libraries have better facilities while comparing to other zones.

10. ELECTRONIC RESOURCES (ER)

E-resources are prime ingredients and useful factors for the growth and development of the academia. Briefly, e-resources refer to information packages made available in digital format. This study consists of online journals databases (e-journals) searchable datasets (CD-ROM databases) learning resources (CD-ROM, audio/video cassettes), etc.

Table 5: Electronic Resource Facilities @ NIT Libraries – Ranking

Libraries	Individual wise %	Zone wise
NIT Tiruchirapalli	100.00	
NIT Hamirpur	86.67	
SVNIT Surat	86.67	
NIT Jalandhar	80.00	
NIT Silchar	80.00	
NIT Calicut	80.00	
NIT Kurukshetra	73.33	
NIT Warangal	73.33	
MANIT Bhopal	66.67	
VNIT Nagpur	60.00	
MNNIT Allahabad	53.33	
NIT Rourkela	53.33	
MNIT Jaipur	53.33	
NIT Durgapur	46.67	
NIT Surathkal	46.67	
NIT Jamshedpur	33.33	
NIT Srinagar	26.67	
NIT Agartala	13.33	
NIT Patna	6.67	
NIT Raipur	6.67	

From the above Table 5, it can be seen that, about three fourth of libraries have more than 50% collections of e-resources (online journals databases, CD-ROM databases and audio and video cassettes) while one fourth libraries are at below average e-collections. With respect to zones performance, the South zone libraries are leading with a 75% followed by West (67%) and North (64%). Not many resources are available at North East, Central and East zones with the percentages of 47%, 37% and 35% respectively.

11. MANPOWER

Professional manpower is crucial and becomes an important component in the library paradigm. Patron expectations and their research needs are high. The new opportunities are created in the areas of processing, organizing, packaging information. Therefore, a professional expertise and competency is necessary to obtain new technological tools and techniques related to the library developments for making effective use of information. The main concern is not to evolve manpower but to acknowledge or uplift the skilled and qualified manpower for the purpose of managing library system and services.

In this study the professional manpower is one of the factors for evaluation of the NIT libraries. There are two categories of manpower has been considered one is professionals in Library and Information Science (LISc) and their qualifications and second one is non-professionals.

Table 6: Manpower Facilities @ NIT Libraries – Ranking
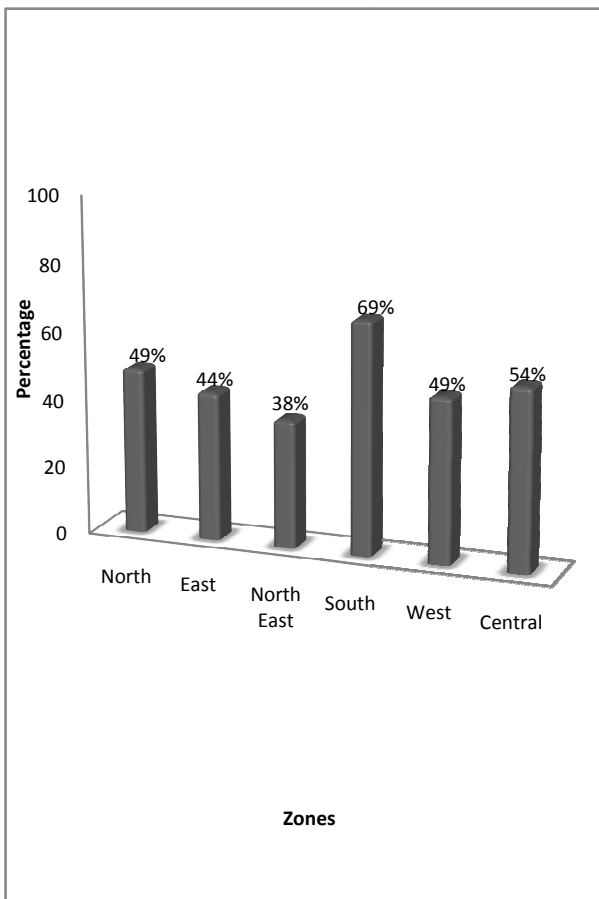
Libraries	Individual wise %	Zone wise
NIT Calicut	76.92	
NIT Warangal	76.92	
NIT Surathkal	69.23	
MANIT Bhopal	69.23	
NIT Srinagar	61.54	
NIT Durgapur	61.54	
NIT Hamirpur	53.85	
NIT Silchar	53.85	
NIT Tiruchirapalli	53.85	
VNIT Nagpur	53.85	
SVNIT Surat	53.85	
MNNIT Allahabad	46.15	
NIT Jalandhar	46.15	
NIT Jamshedpur	46.15	
NIT Rourkela	46.15	
NIT Kurukshetra	38.46	
MNIT Jaipur	38.46	
NIT Raipur	38.46	
NIT Patna	23.08	
NIT Agartala	23.08	

Table 6 presents that, fifty five percent of libraries have reported that they have more than 50% staff while 45% libraries have less than average staff. In considering the zone wise, the South zone (69%) is having more manpower, whereas, Central zone has 54% manpower. The other zones are almost equal in terms of having professional qualified manpower. The percentage of manpower for North, West, East and North-East are 49%, 49%, 44% and 38% respectively.

12. LIBRARY AUTOMATION (LA)

Automation is a buzz word applied ubiquitous. In the library setting, the phase of automation was forced in 1960s. Automation is one of the most important consequences for libraries in order to modernize their system, functions and services. In this study, the LA refers to degree of computerization whether it is fully or partially or in the process. It consists of various integrated library software, installation and management of library software and module functionalities such as acquisitions, cataloging, circulation, serials control, stock-verification and article indexing.

Table 7: Library Automation Facilities @ NIT Libraries – Ranking

Libraries	Individual wise %	Zone wise
NIT Calicut	100.00	
NIT Surathkal	100.00	
MNNIT Allahabad	85.71	
NIT Warangal	85.71	
SVNIT Surat	85.71	
NIT Rourkela	78.57	
NIT Tiruchirapalli	78.57	
VNIT Nagpur	78.57	
NIT Kurukshetra	71.43	
NIT Durgapur	71.43	
NIT Silchar	64.29	
NIT Srinagar	57.14	
NIT Jalandhar	50.00	
MNIT Jaipur	50.00	
NIT Jamshedpur	42.86	
MANIT Bhopal	42.86	
NIT Hamirpur	35.71	
NIT Patna	28.57	
NIT Agartala	28.57	
NIT Raipur	7.14	

Table 7 indicates computerization among NIT libraries. With respect to individual performance, about 70% libraries have automated their libraries at more than average level, while 30% were in the below average. Concerning to zones the South zone (91%) libraries have strong hold on it, whereas, West zone with 71% is distant second followed by North and East zones. Rest of the zones (North East and Central) was below average in performing library automation practices and activities.

13. NETWORKED SERVICES

NS are common in the library, used not only for exchange and share resources among patrons but also for transacting in-house functions and access remote databases. NS are viewed as electronic information services that patrons' able to access library resources residing both at local and remote site through a network media. Shim et al clearly indicate the definition of NS and their use in the library settings (Shim et al., 2001). Essentially, there are two types of services provided by the libraries through network: local and remote. In this study, the NS refer to all library transactions that patrons can do and services they can avail using computer and network technologies. The NS encompass electronic data interchange between publisher/suppliers for acquisition of library materials automated cataloguing for information search and retrieval, automated circulation for check-in, check-out, renewal, reservation, virtual reference for enquiring, electronic current awareness, online databases, Multimedia databases (CD-ROM, audio and video etc.), Electronic Theses and Dissertations (ETD), network communication services (Internet, e-mail, telephone, facsimile, video/teleconferencing and videotext/teletext), e-learning, e-publishing (e-news, blogs) Web-based

document delivery, support services etc.

Table 8: Networked Service Facilities @ NIT Libraries – Ranking
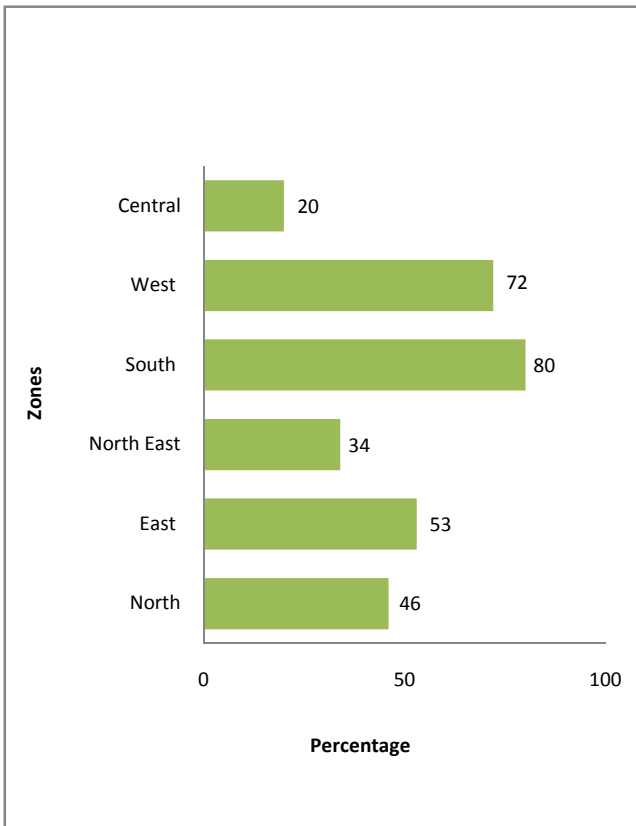
Libraries	Individual wise %	Zone wise
NIT Calicut	92.00	
NIT Tiruchirapalli	84.00	
NIT Rourkela	80.00	
NIT Surathkal	76.00	
VNIT Nagpur	76.00	
NIT Durgapur	68.00	
NIT Warangal	68.00	
SVNIT Surat	64.00	
NIT Silchar	60.00	
MNIT Jaipur	60.00	
NIT Kurukshetra	56.00	
NIT Jamshedpur	52.00	
NIT Jalandhar	48.00	
MNNIT Allahabad	44.00	
NIT Srinagar	44.00	
NIT Hamirpur	40.00	
MANIT Bhopal	36.00	
NIT Patna	12.00	
NIT Agartala	8.00	
NIT Raipur	4.00	

The zone wise column contains a horizontal bar chart with the following values:

- Central: 20
- West: 72
- South: 80
- North East: 34
- East: 53
- North: 46

(x-axis: Percentage, 0 to 100; y-axis: Zones)

Table 8 projected the NS offered by the NIT libraries on individual and zone wise. Majority of services were provided by 60% libraries whereas, 40% libraries reported that they have limited services. Concerning to the zones performance, the South zone (80%) is much ahead of other zones, followed by the West zone with a percentage of 72. The East zone (53%) is moderate and followed by the North zone is 46%. Whereas, the North East (34%) and the Central zone (20%) is below the average in this context of catering these services.

14. CONCLUSION

In this study, NIT libraries play significant contributions towards development of their institutes individually and zone wise. Provisions of multiple facilities would certainly create a value for the institute to plan, implement and manage high quality, efficient and sustainable teaching and learning environment. The NIT libraries are not only in need of building a resource base but also a need of technical hub to access, share, serve and support the academic communities. Despite handicap of workforce, libraries are trying hard at various capacities to improve academic productivity. However,

strategic plans, processes and management approaches will certainly enrich the libraries for meeting best academic and research needs.

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USE OF ELECTRONIC RESOURCES : A CASE STUDY OF SMT. HANSA MEHTA LIBRARY, (THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA), VADODARA

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1. INTRODUCTION

Computer and telecommunication technologies have made it possible to store and disseminate information in e-form. Excellent features of electronic resources have made them popular among the wider population. These resources have opened new vistas of opportunities among students, resources and scholars. The traditional libraries nowadays are getting transformed into digital libraries, which make wide use of computers, telecommunications and microelectronics that helps in online searching, CD-ROM access to information, access to different types of reports, etcetera .(Ram,2002). Thus, traditional services have been replaced by technological advances and processes, and services with electronic versions have been introduced (Meshram, 2000)

2. ELECTRONIC RESOURCES

According to ODLIS: (Online Dictionary for Library and Information Science) Electronic resources are defined as "Material consisting of data and/or computer program(s) encoded for reading and manipulation by a computer by the use of a peripheral device directly connected to the computer or remotely via a network such as the Internet"(Visited on 14/12/04. http://lu.com/odlis/).

"An electronic journal is one where the writing, editing, refereeing and distributions of item are carried out without any paper intermediaries" (Beedi and Vats, 1989).

Smt. Hansa Mehta Library: Shrimati Hansa Mehta Library, the University Library of Maharaja Sayaji Rao University of Vadodara was established on May 1, 1950. At the time of establishment of The M. S. University of Baroda, a collection of 25,000 books belonging to the two State Libraries (Huzur Political Office and Secretariat Library) was handed over to the University Library. There were several colleges in Vadodara - Vadodara College (for Arts), Science Institute, Commerce College, and Secondary Teacher's Training College etcetera. These colleges had libraries of their own. These libraries continued to remain as Faculty Libraries and were administered independently. Thus, the University Library System was established on 1-5-1950, which was housed in the central block of Old Residency Office Building.

University Library System comprises of the main University Library i.e. Smt. Hansa Mehta Library at its apex and 14 constituent Libraries, having a collection of almost 7.5 lacs documents, more than 1100 print journals in at least 85 subject areas. Library caters to the need of more than 22,000 active users comprising of teachers, research scholars, postgraduates and undergraduates. The Library has a single largest reading room in the country, which accommodates 1100 readers at a time and has a total capacity of accommodating 1500 readers at a time in the reading rooms of Smt. Hansa Mehta Library.

Smt. Hansa Mehta Library Collection

Sr. No.	Name of the Library	Holdings Till Date
1.	Smt. Hansa Mehta Library	4,56,033
2.	Sir Sayajirao Memorial Trust (SSMT) Library	4,56,033 Combine with SHML Library
3.	Prof. T. K. Gajjar Library, Faculty of Technology & Engineering.	1,12,670
4.	Polytechnic Library, Polytechnic College	41,170
5.	Faculty of Fine Arts Library.	11,195
6.	Faculty of Management Studies Library.	5,514
7.	M K Amin Arts & Science College and College of Commerce, Padra Library.	14,750
8.	Faculty of Performing Arts Library.	13,077
9.	Faculty of Social Work Library	13,499
10.	Center for Advance Studies in Education (C. A. S. E.) Library	18,959
11.	Oriental Institute Library	49,347
12.	Water Resources Engineering & Management Institute's (WREMI) Library	1,983
13.	Baroda Sanskrit Mahavidyalaya Library	5,244
14.	Department of Biochemistry Library (Faculty of Science)	789
15.	Faculty of Law Library	7,305

Journals: The Library has a rich collection of bound journals of more than one lakh out which some are as old as Nineteenth Century available till date, a few illustrative are as under .

1.	Journal of Royal Asiatic Society, Volume 1 ; 1834 onwards
2.	Annals of the American Academy of Political and Social Science, Volume 1 ; 1890 onwards
3.	Economic Journal, Volume 4 ; 1894 onwards
4.	Geographical Journal, Volume 1 ; 1893 onwards
5.	Proceedings of the Aristotelian Society, Volume 1 ;1890 onwards

Some noteworthy indexing and abstracting journals are also being subscribed:

Biological Abstracts	– 1942 to till date
Current Contents: Life Sciences	– 1963 to till date
Dissertation Abstracts International Section A	– 1973 to till date
Chemical Abstracts	– 1912 to till date
International Political Science Abstracts	– 1952 to till date
Nutrition Abstracts and Reviews Section A	– 1976 to till date
Nutrition Abstracts and Reviews Section B	– 1976 to till date
Physics Abstracts	– 1910 to till date
Psychological Abstracts	– 1946 to till date
Physical Reviews A	– 1970 to till date
Physical Reviews B	– 1970 to till date
Physical Reviews C	– 1970 to till date
Physical Reviews D	– 1970 to till date
Sociological Abstracts	– 1970 to till date

3. E-RESOURCES AVAILABLE AT SMT. HANSA MEHTA LIBRARY:

(a) Business Source Premier (Full Text Online Databases of EBSCO): This database provides

comprehensive full text coverage of more than 7,400 regional business publications. Regional Business News incorporates coverage of 75 business journals, newspapers and newswires from all metropolitan and rural areas within the United States. This database is updated on a daily basis.

(b) Academic Search Premier (Full text online databases of EBSCO): The world's largest academic multi-disciplinary database, *Academic Search Premier* provides full text for more than 4,700 publications, including full text for more than 3,600 peer-reviewed journals. Coverage spans virtually every area of academic study and offers information dating as far back as 1975. This database is updated on a daily basis via EBSCO *host.*

(c) Wilson Social Science Abstracts (1984-2000): Produced by H. W. Wilson Company, it is a bibliographic database that cites articles from more than 420 English language periodicals published in US & elsewhere. The coverage includes a wide range of inter-disciplinary fields covered in a broad array of Social Sciences journals.

(d) EconLit: A bibliographic database published by American Economic Association is the world's foremost source of references to Economic Literature. It is an expanded version of the Journal of Economic Literature (JEL) and is a reliable source of citations and abstracts to Economic research dated as far as 1969. It indexes journal articles, books, dissertations, working papers, Conference Proceedings, collective volume articles and book reviews from 600 international economic journals. It indexes over 500 journals from subject areas like Accounting, Consumer Economics, Demographics, Economic Theory, Labour, Marketing, Modeling, Monetary Policy, and Planning.

(e) ERIC (1966-1998): ERIC database abstracts and indexes the U.S. literature in Education. The document and journal article literature includes research and technical reports, conference presentations, instructional and curriculum materials, project and program descriptions, dissertations etc. Journal articles are drawn from over 775 major journals in the field. The subjects covered are Counseling, Curriculum, Education and Social Sciences. The data covered in the CD is from 1966 - 1998.

(f) CABSAC (1973-1997): Published by CAB International, UK, it is a bibliographic abstract database from and on South Asia from 1973-1998. It contains information on
- Agricultural Engineering
- Animal health & Veterinary Medicine
- Animal husbandry
- Nutrition and breeding
- Biotechnology & Genetics
- Crop production, protection and breeding
- Dairy Science and Technology
- Economics
- Sociology and Rural Development
- Forestry & Forest products
- Horticulture
- Soil Science & Fertilizer Technology
- It also covers related topics like -- Human nutrition, Mycology, Entomology and Parasitology.

(g) IBID (1993-1999): India Business Insight Database: Published by Informatics (India) Pvt. Ltd. Bangalore, it provides extensive coverage of 38000 plus Companies & 10000 plus Products. It gives comprehensive insight into 44 Sectors of Indian industry including Advertising and Market research; Agriculture; Horticulture and Forestry; Automobile and Railway Equipment; Banking, Financial & Insurance services; Chemical Industry; Consumer Goods; Defense & Aerospace; Drugs and Pharmaceuticals; Health care, Electrical Industry; Electronic Industry; Energy; Power Generation and Transmission; Engineering Industry; Ferrous metals; Food, Beverages, Dairy, Confectionery and

Tobacco; Gems and Jewelry; watches; Hotel, Restaurants & Catering; Computer Industry; Telecommunication Industry, Leather and Allied Products, Live Stock, Fish and Animal related ; Mining , Minerals and Metallurgy; Oil and Natural Gas; Rubber Industry; Non-ferrous metals; Oils and fats, Glass and Packaging Industry; Paints and Surface Coatings; Cinematographic equipment; Optical instruments and Photography ; Pollution control including waste management; Polymers and Plastics; Printing and Publishing; Paper Industry; Soaps, Detergents and Cosmetics; Sugar Industry; Textile Industry; Mail and Transportation services etcetera.

(h) PROWESS (1994-2004): Prowess is the most reliable and empowered corporate database developed by Centre for Monitoring Indian Economy (CMIE), Mumbai. It contains a highly normalized database built on a sound understanding of disclosures in India on over 8000 companies. The database provides financial statements, ratio analysis, funds flows, product profiles, returns and risks on the stock markets etcetera.

The database is complemented with powerful analytical software tools to enable extensive querying and research. With Prowess, information access and research is effortless.

The rich analytical reports based on a carefully normalized database in Prowess enable you to sharpen your understanding of a company and quicken the decision making process.

Application areas include credit evaluation, security analysis, industry analysis, benchmarking, and evaluation of competition, feasibility studies, consulting, journalism and research.

(I) Capitaline Plus: Capitaline Plus database giving financial and other information on more than 10,632 companies, of which 4,321 are unlisted, incorporates powerful analytics.

Digital Scanned Annual Reports (PDF) of Top 4,000 Companies for the last four years. Historical Directors'/Auditors'/Chairman's Speech/ Notes to Accounts Reports for the last five years. Fact sheets are powerful aggregation screens wherein one can view scoreboards of companies classified under different catalogs like; Industry, House, State, Country, Product, Stock Exchange, and Index etcetera.

4. OBJECTIVES OF THE STUDY
The objectives of the present study are mentioned below:
- To find out the different types of electronic information resources available in the Smt. Hansa Mehta Library (SHML).
- To determine the purpose and utilization of Electronic Resources by the users.
- To study the extent of awareness about Electronic Resources.
- To find out the hindrance and problems faced by the users while accessing and using the Electronic Resources.
- To observe the impact of Electronic Resources over the traditional resources.
- To find out the yearly expense/finance for the subscription of Electronic resources.
- To find out to what extent the electronic resources satisfy the needs of the users.
- To suggest improvements in the use of electronic resources and services in the library.

5. METHODOLOGY & PROCEDURE OF THE STUDY
In the present study survey method is used for conducting the research. In this method, a sample is taken from the large population and generalization is made. The investigator has selected the two disciplines for the purpose of the study i.e. Physics and Chemistry departments, of Faculty of Science, of The Maharaja Sayaji Rao university of Baroda for the research work as they were the major users for the electronic -resource services and the major expense for the electronic journals were done for the science department of Shrimati Hansa Mehta Library. The major users were the Professors, Associate Professors and Asst.Professors.as well as Research Scholars. The two main techniques of the survey method, which were incorporated to collect the data from the users, were interview

schedule and questionnaire.

The questionnaires were distributed to the students and faculty members' .There were total 60 faculty members working in the Chemistry and Physics department, Copies of the questionnaire was distributed to 55 faculties. However 50 faculty members only responded by returning the completed questionnaire. The total strength of the students of both the disciplines were 276, the questionnaires were distributed to all the students with full efforts. However 200 students returned the questionnaires after completing it. Then the data was analyzed and interpreted for the outcome and presented in the following table.

6. DATA ANALYSIS
Distribution of questionnaire:

Table 1: Chemistry Department

Respondents	Total Strength	Questionnaire Distributed	Response Received	Response Percentage
M.Sc. Previous year students	57	57	41	72
M. Sc. Final Year students: Organic Chemistry	37	37	28	76
M. Sc. Final Year students: Inorganic Chemistry	9	9	6	73
M.Sc. Final Year Students: Physical Chemistry	4	4	4	100
M.Sc. Final Year Students: Analytical Chemistry	6	6	5	83
Research Scholars	25	25	18	69
Faculty members	30	28	20	70
Total	168	166	122	73.49

Table 2: Physics Department

Respondents	Total Strength	Questionnaire Distributed	Response Received	Response Percentage
Previous year students	48	48	35	73
Final Year students	63	63	44	71
Research Scholars	27	27	19	68
Faculty members	29	27	18	70
Total	167	165	116	70.3

Use of Electronic Resources: The use of e-resources of the university library has been depicted below in table-3

Table 3: Awareness and Use of Electronic Resources

Respondents	Chemistry Department		Physics Department	
	Yes	No	Yes	No
Previous year students	20	21	21	14
Final Year students	32	10	33	11
Research students	16	2	19	--
Faculty Members	18	2	17	1
Total awareness of e-resources	86 (71.07%)	35 (28.92 %)	90 (77.58%)	26 (22.41%)

Analysis by Sources Used for Getting Information:

Table 4: Analysis by Preference of Source of Information

Sources of Information	Category			Total Number & Percentage
	Students	Research Scholars	Faculty Members	
Print Material	97 (60%)	19 (52%)	25 (66 %)	141 (59 %)
Online Resources	73 (45%)	27 (72%)	28 (76%)	128 (53 %)
Web Resources	55 (34%)	16 (47%)	19 (50%)	91 (38 %)
CD-ROM	21 (13%)	3 (8%)	2 (7%)	26(10.92%)
Audio-Visual Tapes	17 (11%)	2 (6 %)	----	19 (7.98%)

The user visits the library to fulfill the information needs by consulting the documents available in the library. The users of the library were asked to indicate the types of resources which they prefer to use. Different types of information resources were listed in the questionnaire. Table-4 reveals the use of different sources and their preferences by the users of the Shrimati Hansa Mehta Library. The table 4 reveals that While 141 (59%) use print material, 128(53%) and 91 (38%) users of Shrimati Hansa Mehta library are using the online and web resources of the library which means e-resources are second most commonly used resource of the library. In this information age with the availability of more and more information accessible to the users through the electronic environment, most of the users prefer to use the e resources due to its flexible and convenient access. But due to different problems, the users of Shrimati Hansa Mehta Library, Vadodara prefer to use print materials. Moreover, 26(10.92%) uses CD-ROM and 19 (7.98%) uses Audio-Visual Tapes.

Purpose of Use of e-resources:

Table 5: Shows the Purpose of Using the E-Resources by the Users of the Library

Table 5: Purpose of Use of E-Resources

Purpose	Students	Research Scholars	Faculty Members	Total Number of Percentage
To update Knowledge	94 (58%)	17 (46%)	18 (47%)	129 (54.2%)
Supporting academic research work	24 (15%)	30 (81%)	32 (85%)	86 (36 %)
Preparing notes	74 (46%)	3 (8%)	19 (50%)	96 (40.3%)
Writing an article	19 (%)	12 (34%)	25(66%)	56 (23.5%)
Preparing lectures	4 (3%)	2 (5%)	14 (38%)	20 (8.4%)

The respondents were asked to indicate the purpose of use of e-resources which differ from one user to another. The major purposes of use of e-resources are listed in Table-5 which forms the quantitative study that gives an indication of the core purpose of e-resources used by the users of Shrimati Hansa Mehta Library. It is revealed from Table-5 that a majority of 129(54.2%) number of the respondents use the e-resources of the library to update knowledge while other use to support academic research work that constitute 86 (36%), 96 (40.3%) to prepare notes, 56 (23.5%) to write an article. The table also indicates that among the users community the purpose of use of e-resources vary from category to category. Among the users, 94 (58%) students use e-resources to update knowledge which ranks the first followed by 32 (85%) number of teachers and 30 (81%) number of research scholars who use for supporting academic and research work respectively and ranks in the second and third position.

Table 6: Use of Various Electronic Resources

Data Bases	Students	Research Scholars	Faculty Members	Total Number and Percentage
E-Journals	130 (80%)	34 (93%)	32 (85%)	196 (82.3%)

E-Books	49 (30.4%)	20 (55.4%)	9 (24%)	78 (32%)
E-Thesis	8 (5%)	5 (15 %)	3 (8%)	16 (6.7%)
E-News paper	13 (8%)	4(10%)	8 (21%)	25 (10.5%)
E-mail	140 (86%)	32 (86.4%)	30 (78%)	202 (84.8%)
E-Research Report	128 (78.8%)	26 (72%)	27 (31%)	75 (31.5%)
E-Bibliographic databases	13 (8%)	9 (24%)	6 (16%)	28 (11.7%)
CD-ROM	9 (6%)	2 (3.5%)	3 (8.5%)	14 (5.9%)

Table 6 shows that the majority of the students 140 (86%) and teachers 32 (86.4%) and research scholar 30 (78%) prefer to use e-mails. Second highest preference is E-Journals total 82.3 % uses the E- Journals and use of e-books with total 32 %. This highlights that only the well-known e-resources are preferably used by the researchers and faculty members, the rest of the e-resources i.e. e-bibliography, e-maps, e-thesis, e-books are comparatively less used.

Use of UGC- Infonet:

Table 7: Use of UGC-INFONET

Sr. No.	Use of UGC-INFONET	Students	Research Scholars	Faculty members	Total Number and Percentage
1	Yes	56 (34%)	23 (64%)	35 (92.38%)	114 (47.8%)
2	No	107 (66%)	14 (36%)	3(7.6%)	124 (52.2%)

Rate of Satisfaction with Regard to the e-resources Services of the Library: The rate of satisfaction is another important factor to measure the standard of library services. In this study the authors have measured the satisfaction rate according to the scale of excellent, good, moderate and no comment obtained through the questionnaire. The data has been placed in Table-8.

Table 8: Rate of Satisfaction

Sr. No.	Rate of Satisfaction	Students	Research Scholars	Faculty Members
1	Moderate	42 (39.4%)	8 (22.74%)	3 (8.14%)
2	Good	49 (47%)	22 (63.67%)	27 (78.57%)
3	Excellent	10 (8.6%)	4 (11.59%)	3 (9.25%)
4	Poor	5 (5%)	1 (2%)	2 (4.04%)
	Total	106 (100%)	35 (100%)	35 (100%)

 Analysis of the Table -8 reveals that out of 238 respondents, a major chunk of the respondents i.e. 176 (73.94%) express their awareness and the use of E-resources which is shown in table 8 in a elaborated way. The students views as good (47%) while, 5(5%) respondents express as poor and 10 (8.6%) say as excellent. It is good to find out that the research students maximum use the e-resources and respond as good 22 (63.67%) and poor is the minimum no. The good no. of faculties have also responded as good 27 (78.57%). and poor 2 (4%).

Problems in Accessing e-resources: The study then sought to find out the main problems users had with accessing e-resources. Determination of the problems helps the library and information centers to increase the efficiency and effectiveness of its services. To understand the problems facing by the users, the problem is categorized into four different categories as shown in following Table-9.

Table 9: Problems in accessing e-resources

Sr. No.	Problems	Students	Research Scholars	Faculty Members	Total number and Percentage
1	Accessing e-resources	100 (61.54)	22 (60.8)	27 (71.4)	149 (62.6)

2	Limited access terminals	21 (13.19)	5 (12.9)	6(6.8)	32 (13.4)
3	Slow internet speed	71 (43.4%)	18 (48.9)	20(52.6)	109 (45.7)
4	Internet connectivity	30 (18.35)	6 (17.4)	7 (18.2)	42 (17.6)

The authors obtained the views through the questionnaires distributed to the respondents. Accessing the electronic resources was the major problem; total 149 (62.6%) users were not comfortable in accessing the electronic resources. The terminals provided for the use of electronic resources was the problem for the students, the terminals are not enough for them and the slow internet speed and connectivity was the major problem for all the users that was 109 (45.7%) and 42 (17.6%) .However, the University has plans to install on campus Wi-Fi system, which once completed would reduce much of the problems.

Table 10: Do E-Resources Diminish the Importance of Traditional Resources

Respondents	Total	Yes	No
Students	163	51 (31.3%)	112 (68.7%)
Research Scholars	37	10 (26.7%)	27 (73.3%)
Faculty members	38	13 (36%)	25(64%)

Table -10 reveals that a large number of Faculty members, 25 (64%), and researchers 27 (73.33%), think that e-resources never diminish the importance of traditional resources, whereas 13 (36%) faculty members and 10 (26.67%) research scholars feel that e-resources may replace traditional sources of information. The results of table show that in the era of information and technology, academics are equally attached to traditional sources of information.

The study shows the use of e-resources is very common among the teachers and research scholars of Smt. Hansa Mehta Library, The M S University of Baroda. Most of them are heavily dependent upon e-resources to get the desired and relevant information.

7. CONCLUSION

It is evident from the results that uses of electronic resources have a great impact on the academic community. The researchers in various branches of sciences are making maximum use of the Internet facility provided by the university. However, there remains much to be done by the librarian. Although subject gateways are available in their fields, they are not known to the researchers so they are unable to find or locate free online resources on Internet. In this context, library should provide information literacy or short term training programmes to research scholars and all the academic staff so that they can take advantage of freely available subject gateways on the Internet. For this purpose, firstly the academic staff should be encouraged to use electronic resources and information sources for their studies and research purposes. Secondly, the librarians should provide proper training to use online information sources.

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Section IV
INFORMATION MANAGEMENT

LEARNING MANAGEMENT IN LIBRARY THROUGH MOODLE : A STUDY

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1. INTRODUCTION

Implications of Information Technology (IT) in the process of education and learning have changed the traditional learning systems to Virtual Learning Environment (VLE). Teachers prefer to teach their students in a student centred model instead of traditional transmission model. Enormous growth of information, ready access to the internet has created possibilities for this. Teaching the students in a Virtual Learning Environment using a Learning Management System (LMS) can be more effective and qualitative. A Learning Management System can be advantageous in self study activities, extension activities and monitoring of student's achievement. So, Moodle is gaining its popularity both in eastern and western countries as a course management system in academic institutions and business organizations.

2. MOODLE: WHAT

Moodle is a web application that educators can use to create effective online learning sites. The word Moodle was originally an acronym for Modular Object- Oriented Dynamic Learning Environment, which is mostly useful to programmers and education theorist. It's also a verb that describes the process of lazily meandering through something, doing things as it occurs to you to do them, an enjoyable tinkering that often leads to insight and creativity. As such it applies both to the way Moodle was developed, and to the way a student or teacher might approach studying or teaching an online course. Moodle has features that allow it to scale to very large developments and hundreds of thousands of students, yet it can also be used for a primary schools or a university or business organization. Many institutions use it as their platform to conduct fully online courses, while some use it simply to augment face to face courses. Many users love to use the activity modules to build richly collaborative communities of learning around their subject matter, while others prefer to use Moodle as a way to deliver content to students and access learning using assignments and quizzes.

3. MOODLE: WHY

- *An easy way to communicate with students and staff where ever they are*: The news form automatically emails messages to all students and staff on the course. Forums can also be used to answer commonly asked questions – and prevent repeats, to provide a space for informal peer to peer student discussion or even online tutorials.
- *A quick way to share documents:* Moodle provides a place where you can easily create web pages with information about your course and provide links to word documents, slides, and other resources that your students will want to access.
- *Easy access to relevant and useful online resources:* The department and the university provide a wealth of materials and resources, but catering for so many different types of students it can be hard for learners to find those that are most relevant to them. You can use your Moodle to provide links directly to the resources that will be most useful for your students whether e-library

resources, skills courses, or information about nice pubs to visit in Oxford.

- *Online assignment handling:* When your students and tutors are not close to Oxford online assignment handling can save time and effort for everyone involved – whether it is just used for student submission with marking done on paper or the whole process is moved online saving time, postage and paper.
- *Save time and money:* Making resources available online can save time and money in photocopying.
- *Control access to different areas:* Can make a space for dispersed tutors to communicate with each other as well as students.
- *Designed to encourage collaborative learning:* Moodle makes it easy to model the oxford tutorial system online if you want to use it with globally distributed students.

4. INSTITUTIONS/ ORGANIZATIONS USING MOODLE

Over 1150 organizations in 81 countries had registered Moodle sites by December 2011 (http://moodle.org/sites). This number is growing by about 10% each month as educators and trainers learn the value of implementing open source Moodle.

Moodle is used as an ideal online learning solution for different schools, colleges, business organizations and governmental agencies;
- K-12 Schools
- Colleges
- Universities
- Governmental Agencies
- Businesses organizations
- Trade Associations
- Hospitals
- Libraries
- Employment Agencies etc.

5. COURSE MANAGEMENT FEATURES OF MOODLE

- **Assignment:** Used to assign online or offline tasks; learners can submit tasks in any file format (e.g. MS Office, PDF, image, a/v etc.).
- **Chat:** Allows real-time synchronous communication by learners.
- **Choice:** Instructors create a question and a number of choices for learners; results are posted for learners to view. Use this module to do quick surveys on subject matter.
- **Dialogue:** Allows for one-to-one asynchronous message exchange between instructor and learner, or learner to learner.
- **Forums:** Threaded discussion boards for asynchronous group exchange on shared subject matter. Participation in forums can be an integral part of the learning experience, helping students define and evolve their understanding of subject matter.
- **Resource:** The primary tool for bringing content into a course; may be plain text, uploaded files, links to the web, Wiki or Rich Text (Moodle has built-in text editors) or a bibliography type reference.
- **Survey:** This Moodle aids an instructor in making online classes more effective by offering a variety of surveys (COLLES, ATTLS), including critical incident sampling.
- Workshop- An activity for peer assessment of documents (Word, PP etc.) that students submit online. Participants can assess each other's project. Teacher makes final student assessment.
- **Glossary:** Create a glossary of terms used in a course. Has display format options including entry list, encyclopaedia, FAQ, dictionary style and more.
- **Journal:** Learners reflect record and revise ideas.
- **Label:** Add descriptions with images in any area of the course homepage.

- **Lesson:** Allows instructor to create and manage a set of linked "Pages". Each page can end with a question. The student chooses one answer from a set of answers and either goes forward, backward or stays in the same place in the lesson.
- **Quiz:** Create all the familiar forms of assessment including true-false, multiple choice, short answer, matching question, random questions, numerical questions, embedded answer questions with descriptive text.
- **Block:** A Block in Moodle is an item that a teacher can add to the left or right of a Moodle course page. They provide extra information or links to aid learning. Blocks are a bit like "widgets" elsewhere online and can contain for example, RSS news feeds, quiz results, a calendar, links to blogs, glossary terms or private files. There is also a simple HTML block which can be customized as the teacher wishes. A teacher can add blocks by turning on the editing and choosing from the "Add a block" drop down which is usually on the bottom right side of the course page. Blocks usually appear on the sides of a course.

6. INSTALLATION OF MOODLE

For installation of Moodle in any kind of educational and learning setup, one may require these following standards of H/w and S/w;

Hardware Requirement:
- 256 MB RAM (minimum), 512 MB RAM (recommended)
- 160 MB free Fixed Disk (more space will be needed depending on user uploads)
- Windows 98/ME (minimum)
- Windows NT/2000/XP (recommended)
- Install complete package process

Software Requirement: Moodle is primarily developed in Linux using Apache, MySQL and PHP (also sometimes known as the LAMP platform) the complete install package is a zip file that contains a web server called Apache, plus Moodle and Moodle's required MySQL database and PHP program.

There are three basic parts to the install process.
- Download and unpack the complete install package.
- Start the web server.
- Install Moodle using a web browser.

7. CONCLUSION

If your organization is ready or needs to support an online learning population, here is an opportunity to take your research to the next level. These Moodle sites are open for you to explore either as a learner, or teacher with course creator privileges.

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DISASTER MANAGEMENT IN SCIENCE AND SOCIAL SCIENCE RESEARCH LIBRARIES AT KOLKATA : CASE STUDIES

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1. INTRODUCTION

The word "Disaster" is derived from the Latin words "dis" and "aster" meaning "apart" and "star." The current use of the word reflects the notion of an unlucky star and is "anything that befalls of ruinous or distressing nature; a sudden or great misfortune, mishap, or misadventure; a calamity." WHO defines Disaster as "any occurrence that causes damage, ecological disruption, loss of human life, deterioration of health and health services, on a scale sufficient to warrant an extraordinary response from outside the affected community or area."Disaster management in general terms is defined as the actions taken by an organization in response to unforeseen or unexpected events that adversely affect the environment and people in the area surrounding that organization. These events, examples of which include fire, flooding and earthquakes, could also threaten the continued operation of the organization. Disaster management is the combination of two major undertakings by an organization, the development of a disaster recovery plan and the implementation of those plans should the need arise. The effectiveness of disaster plans in libraries posits that disaster management also encompasses "broader management issues such as finance, risk assessment and training" and should be considered a key area of library management". Library and information academics and professionals are concerned about the issue of risks and disasters that threaten libraries and information services due to a wide number of man-made and natural causes.

2. DISASTERS ARE MAINLY OF TWO TYPES

- Natural disasters. Example – earthquakes, floods, landslides, storms, tsunami, drought, fire, etc.
- Man-made disasters. Example –technological, chemical, wear and tear, theft, etc.

A natural disaster is a consequence when a natural hazard (e.g., volcanic eruption or earthquake) affects humans and/or the built environment. The resulting loss depends on the capacity of the population to support or resist the disaster: their resilience. This understanding is concentrated in the formulation: "disasters occur when hazards meet vulnerability". A natural hazard will hence never result in a natural disaster in areas without vulnerability, e.g., strong earthquakes in uninhabited areas.

Man-made disasters are disasters resulting from man-made hazards (threats having an element of human intent, negligence, or error; or involving a failure of a man-made system). Man-made hazards or disasters are sometimes referred to as anthropogenic.

3. DISASTER MANAGEMENT-WHAT AND HOW?

Disaster Management is the discipline of dealing with and avoiding risks. It is a discipline that involves preparing, supporting, and rebuilding society when natural or human-made disasters occur. In general, any Emergency management is the continuous process by which all individuals, groups, and communities manage hazards in an effort to avoid or ameliorate the impact of disasters resulting from the hazards. Actions taken depend in part on perceptions of risk of those exposed. Effective emergency management relies on thorough integration of emergency plans at all levels of government and non-government involvement. Activities at each level (individual, group, community) affect the other levels. Disaster Management is the only term that captures the full range of meaning in what we do in security and natural hazard events. By including threat assessment, vulnerability, detection, and action, disaster management is comprehensive. The disaster management profession is composed of those occupations that need to maintain high states of readiness and whose tasks are to manage events that are extra-ordinary, and therefore costly. To achieve our primary objective of reducing costs (monetary and non-monetary) of disasters, the definition of what we do therefore is to improve effectiveness in the disaster management system using a comprehensive approach with our efforts.

A graphic Representation of the Phases in Disaster Management

The phases in the disaster management can be analysed as follows:

- Prevention: avoiding and reducing the chances of disaster, usually the impact and damage of disaster.
- Preparedness: plans or preparations made to save lives or property, and help the response and rescue service operations. This phase covers implementation/operation, early warning systems and capacity building so the population will react appropriately when an early warning is issued.
- Mitigation: any activity that reduces either the chance of a hazard taking place or a hazard turning into disaster. Examples: building codes and zoning; vulnerability analyses; public education.
- Risk reduction: anticipatory measures and actions that seek to avoid future risks as a result of a disaster.
- Response: includes actions taken to save lives and prevent property damage, and to preserve the environment during emergencies or disasters. The response phase is the implementation of action plans.
- Recovery: includes actions that assist a community to return to a sense of normalcy after a disaster.

4. DISASTER MANAGEMENT CYCLE
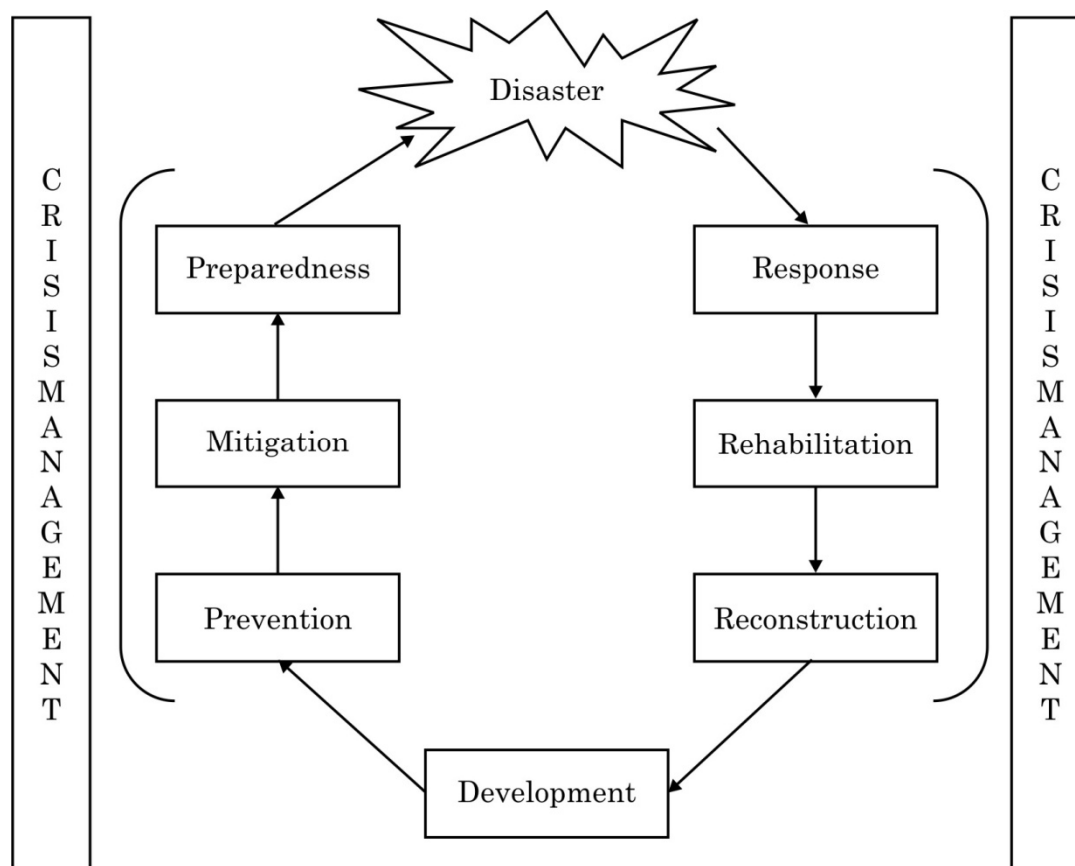
5. DISASTER MANAGEMENT IN LIBRARIES

Disaster management has moved to the forefront of library and archive concerns, due to the considerable increase of natural disasters in the past decade. Because of the vast and varying collections of information in both physical and digital manifestations, that are the most valuable assets that many of these organizations possess, disaster management has turned into an essential event. The planning and implementation of a disaster recovery plan must be understood by the entire organization that it is not a quick fix, "it is not possible to extinguish the fires or contain the floods and quickly return to normal operations". In the event of a disaster, there is a "ripple effect" that may require extraordinary efforts, resulting in suspended period before the status quo can be returned .A disaster management plan or disaster recovery plan is designed to prevent catastrophic damage from happening and ease the process of recovering from any damage that is incurred, "enabling people to overcome the confusion and turmoil created by a disaster and providing pre-planned and rehearsed courses of action."

The creation of a disaster plan is a process that involves the cooperation of a number of entities within and without an organization. A DPT or Disaster Planning Team should consist of personnel from each area of the library or archive, so as to gain all available input, experience, and participation. Therefore this paper is an effort to study the various approaches of disaster management in science and social science research libraries at Kolkata as these libraries are immensely responsible for the progress of the country.

6. REVIEW OF RELATED LITERATURES

Thorburn, Georgine (1994) in his article entitled "Burning Books: The Work of DOCUMENT SOS" points out that the highest rate of library arson in the world is in the UK. It aims to heighten awareness

of the risk and to dispel myths and misinformation given in manuals and videos by non-professionals in the field of disaster reinstatement. He suggested that, though disaster planning and preparedness are critical, effort is often concentrated on irrelevant issues. The article draws on the experience of DOCUMENT SOS, the only company in the world which specializes in library disasters. The organization's Library Disaster Centre Database collates information from libraries which have experienced disaster, which can then be used to guide further operations. Suggests that an average fire-damaged library stock of 30,000 books can be reinstated in six weeks, that damaged books should never be moved and that freeze/vacuum drying is only required for water-damaged antiquarian or irreplaceable books.

Mathews, Graham and Eden, Paul (1996) in the paper entitled "Disaster management training in libraries" presents interim findings of a year-long project examining disaster management policy and practices in British libraries and suggests areas which should be covered in a disaster training programme, having drawn on the experience of librarians, archivists, museum officers, heritage organizations, disaster salvage and recovery companies, commercial binders, fire service officers, loss adjusters and local authority insurers. They conclude that all libraries and information centres need to take practical measures to minimize the risk of disaster and be prepared to react quickly and effectively should a disaster occur. Disaster training is therefore an essential requirement of any disaster management programme.

Muir, Adrienne and Shenton, Sarah (2002) in an article entitled "If the worst happens: the use and effectiveness of disaster plans in libraries and archives" shows six case studies of UK libraries and archives to investigate the development and use of disaster plans. They state that during a disaster, the key in any response is leadership, an experienced team of staff with knowledge of the collections and on-site conservation expertise. The most useful part of the plan for disaster response is its contact lists. However, the plan is an important policy and training document. It requires continued managerial commitment and should be supported by an organisational culture of disaster awareness and prevention. Organisational issues are the major constraint on the effectiveness of disaster planning and response. There is a need to investigate current levels of planning in the UK in order to determine what still needs to be done in terms of awareness raising. They stated that methods of testing the disaster plan and co-operation in disaster management also require further research.

Kaur, Trishanjit (2009) in his article entitled "Disaster planning in university libraries in India: a neglected area" makes a case study of two university libraries in Punjab state of India that faced the fury of floods during July 1993. Their experience with disaster, losses incurred and action taken in libraries is discussed. The paper concludes with a few suggestions and said that among the two, one university library lost just over 70 per cent of its collection in flood. The other was fortunate and only minor loss was reported.

Topper, Elisa F (2011) in an article entitled "After Hurricane Katrina: The Tulane Recovery Project" examines the Howard-Tilton Memorial Library at Tulane University and the creation of the Tulane Recovery Center, which can serve as a model for other to follow and how the staff dealt with the aftermath of Hurricane Katrina.

7. OBJECTIVES OF THE STUDY

- To find out the disaster management system available in the libraries of three sciences and three social science research institutes at Kolkata.
- To make a comparative study regarding disaster management in these institutions.
- To find out the different problems regarding disaster management faced by these Research Libraries.
- To give the probable suggestions for solving the problems.

8. IMPORTANCE OF THE STUDY

In any research library, documents are expensive and rare including print, manuscripts and e-resources. As disasters are generally unexpected events with destructive consequences to a collection therefore disaster preparedness is an essentiality. Disasters have been increasing in frequency and intensity in the recent years due to the fact that human settlements and activities are interfering with natural systems, and populations are being increasingly exposed to hazards. Good disaster management can help to prevent events such as these happening; and, if they happen, it helps to minimize their effects. It makes the staff aware of the various disasters possible in a library and their prevention procedures. This study focusing on the procedures followed for disaster management by the research institute libraries will not only depict the ways of disaster preparedness but also find out the loopholes in these institutions which can be avoided by making the system strong. It will provide some remedies which helps to overcome the situation if disaster happens.

9. SCOPE AND COVERAGE

The study includes three social science research institute libraries and three science research institute libraries at Kolkata. The three Social Science Research Institute libraries covered in this study include:

- Centre for Studies in Social Sciences, Calcutta (CSSSC).
- The Institute of Development Studies Kolkata (IDSK), Salt Lake Campus
- The Central library of Anthropological Survey of India (ASI libraries)

The three Science Research Institute libraries include:

- Bose Institute (BI)
- Indian Institute of Chemical Biology (IICB)
- Central Glass and Ceramic Research Institute (CGCRI)

10. METHODS USED

The field survey method is chosen using combination of techniques like questionnaire, interviews and participant observation. By personally meeting with the librarians or In-charge of the science and social science institution libraries, the data is collected and then the data is tabulated and analyzed accordingly. Also a comparison is drawn to judge which group of institutions have better disaster management techniques in case a disaster happens.

11. FINDINGS

On comparing the disaster management approaches in the science and social science research institute libraries the following results are revealed:-

Table 1: Precautionary measures taken by the Social Science Research Libraries

	CSSSC			IDSK			ASI		
	Yes	No	Don't Know	Yes	No	Don't Know	Yes	No	Don't Know
Follow local Building codes for earthquake resistant construction	√	-	-	√	-	-	√	-	-
Large overhangs	-	√	-		√			√	
Gap between the stairs & library room	-	√	-	√	-	-	√	-	-
Regular inspections of building and equipment	-	-	√	√	-	-	-	-	√
Earthquake recovery plan	-	-	√	-	-	√	-	-	√
Check for fires and other damages	-	-	√	√	-	-	√	-	-
Shut of electric mains, switches,	√	-	-	√	-	-	√	-	-

	Yes	No	Don't Know	Yes	No	Don't Know	Yes	No	Don't Know
gas etc.									
Whether Regular Preservation & Conservation done or not	√	-	-	√	-	-	√	-	-

Table 1 shows the precautionary measures in social science research libraries. The library building of the CSSSC, IDSK and ASI follow local building codes for earthquake resistant construction. They have no large overhangs in any floor in the building. There is no gap between the staircase & library room in the library of CSSSC but in the building of IDSK, there is a gap between the stairs case & library room. In the building of ASI, there is a gap between the stairs & library room and in the gap, there are 8 shelves whose height is 8 ft each and the shelves are with binding journals. These shelves are not attached with wall and in front of the gate; there are new arrival display racks and deposit of property racks. They have an electrician and a contractor who check buildings and equipments regularly. During disaster, the staff shut down electric mains, switches and pulls out the plugs. All rare collections and valuable documents such as Insurance policies, Reports, list of Clientele(s) & staff etc. are stored in the separate area of these three libraries which are protected from fire. These libraries also take necessary steps for preservation.

Table 2: Precautionary measures taken by the Science Research libraries

	BI			IICB			CGCRI		
	Yes	No	Don't Know	Yes	No	Don't Know	Yes	No	Don't Know
Follow local Building codes for earthquake resistant construction	√	-	-	√	-	-	√	-	-
Large overhangs	-	√	-		√			√	
Gap between the stairs & library room	√	-	-	√	-	-	√	-	-
Regular inspections of building and equipment	√	-	-	√	-	-	√	-	-
Earthquake recovery plan	-	-	√	√	-	-	-	-	√
Check for fires and other damages	√	-	-	√	-	-	√	-	-
Shut of electric mains, switches, gas etc.	√	-	-	√	-	-	√	-	-
Whether Regular Preservation & Conservation done or not	√	-	-	√	-	-	√	-	-

Table 2 shows the precautionary measures taken by the Science Research libraries. All the three science research libraries show local building codes for earthquake resistance. There are no large overhangs in any of the libraries. In all the three libraries a gap between the stairs and library room has been noticed. All of them have electrician and a contractor who check buildings and equipments regularly. During disaster, the staff shut down electric mains, switches and pulls out the plugs. Earthquake recovery plan is seen in IICB library only. All rare collections and valuable documents such as Insurance policies, Reports, list of Clientele(s) & staff etc. are stored in the separate area of these three libraries which are protected from fire. These libraries also take necessary steps for preservation.

Table 3: Fire systems in the Social Science Research Libraries

Systems	CSSSC	IDSK	ASI
Heat and smoke detectors	-	-	-
Audible alarms signals	-	√	-
Pull or break-glass-style alarms	-	√	-
Sprinkler systems	√	√	-
Access points to building(Fire Brigade)	√	√	-

Store and supply of water for Fire Brigade	√	√	-
Operational Fire extinguishers	√	√	√
Operational smoke and monoxide detectors	-	-	-

Table 3 shows the available fire systems in the Social Science Research libraries. None of the libraries have heat and smoke detectors. However audible alarm signal and break glass-style alarms are present at IDSK. The libraries of CSSSC and IDSK have taken specialised protection system from fire such as sprinkler system and existence of operational fire extinguishers is noticed in all the three libraries. Both CSSSC and IDSK libraries have access points for the entrance of fire brigade to the building and can also supply the water whenever necessary. Among the three, the Central library of ASI is lacking many facilities available at other libraries.

Table 4: Fire systems in the Science Research Libraries

Systems	BI	IICB	CGCRI
Heat and smoke detectors	-	√	-
Audible alarms signals	-	√	-
Pull or break-glass-style alarms	-	√	-
Sprinkler systems	-	-	-
Access points to building(Fire Brigade)	√	√	-
Store and supply of water for Fire Brigade	-	-	-
Operational Fire extinguishers	√	√	√
Operational smoke and monoxide detectors	-	-	-

Table 4 shows fire systems in the Science research libraries. Among the three libraries only IICB library has adequate fire protection systems. It has heat and smoke detectors, audible alarm signals, break-glass style alarm and operational fire extinguishers. However sprinkler systems are lacking in all the three libraries. Even the access point to the building at CGCRI is too narrow in case of CGCRI. Only one fire protection system i.e. portable fire extinguisher is noticed at all the libraries.

Table 5: Awareness Programmes Conducted by the Social Science Research Libraries

Different Programmes	CSSSC	IDSK	ASI
Fire extinguisher use	√	√	√
Automated external defibrillator	-	-	-
Emergency Preparedness	-	-	-
First aid	√	√	√
Building evacuation	√	√	-

Table 5 shows different awareness programmes conducted by the Social Science Research libraries. The library of CSSSC conducts different awareness programme such as fire extinguisher use, first aid and building evacuation and both the staff (professional and non professional) attends the programme. The library of IDSK and the Central library of ASI have operational fire extinguishers and conducts different awareness programme such as fire extinguisher use and first aid. However building evacuation training is given to IDSK staff members only. However a disappointing fact is that no library among the three has emergency preparedness training.

Table 6: Awareness Programmes Conducted by the Science Research Libraries

Different Programmes	BI	IICB	CGCRI
Fire extinguisher use	√	√	√

Automated external defibrillator	-	-	-
Emergency Preparedness	-	-	-
First aid	√	√	√
Building evacuation	√	√	-

Table 6 shows the awareness programme conducted by science research libraries. The staff members of all the three science research libraries are given training for the use of fire extinguisher. First aid use is also known by all the staff members of these libraries. However emergency preparedness is lacking in all these libraries. It is quite disappointing to note that though the gates of CGCRI are too narrow for entry into the library no building evacuation training is provided to the staff and users.

Table 7: Disaster Occurrence in the Social Science Research Libraries during last 10 Years

	CSSSC	IDSK	ASI
Extreme cold / Snow / Frost	-	-	-
Heavy rain / Hail / Floods	√	-	-
Fire	-	-	√
Strong wind	√	-	√
Infrastructural damage	-	-	-

The table 7 shows the disaster occurrence in the Social Science Research libraries during last 10 years. The library of CSSSC faced heavy rain and strong wind but the library was not seriously affected. The library of IDSK did not face any disaster. The Central library of ASI faced fire due to short circuits which damaged some collection of the library and also strong wind / Tornado which did not cause damage to the library.

Table 8: Disaster Occurrence in the Science Research Libraries during last 10 years

	BI	IICB	CGCRI
Extreme cold / Snow / Frost	-	-	-
Heavy rain / Hail / Floods	-	-	-
Fire	-	-	-
Strong wind	√	√	√
Infrastructural damage	-	-	-

Table 8 shows the disaster occurrence in the Science Research libraries during ten years. All these three science research libraries did not face any disaster other than the strong wind however they were not affected seriously. Only minor breaking of window glass panes occurred.

Table 9: Precautions Taken for Protection from Disaster in the Social Science Research Libraries

	CSSSC			IDSK			ASI		
	Yes	No	Don't Know	Yes	No	Don't Know	Yes	No	Don't Know
Copy of an emergency telephone tree with contact information and detailed instructions	√	-	-	√	-	-	√	-	-
Store Library Data backups off-site regularly	√	-	-	√	-	-	√	-	-
Buildings, collections and	√	-	-	√	-	-	-	√	-

equipments covered by insurance									
Attach furniture, **pictures, mirrors, shelves and light fixtures** to the walls or the floor by calm	-	√	-	-	√	-	-	√	-
Digitize valuable, rare and/or important items	√	-	-	√	-	-	√	-	-
Maintain a record of all disasters happening, their frequency and consequences	-	√	-	-	√	-	√	-	-
Has the library any anti theft systems	-	√	-	√	-	-	-	√	-
Use signs to alert and communicate with patrons and other offices	√	-	-	√	-	-	-	√	-
Budget Allocation	-	√	-	-	√	-	-	√	-
Installed Lightning arrester	√			√			√		

Table 9 shows different precautions taken for protection from disaster in the Social Science Research libraries. A list of library staff members along with their telephone numbers who stay in the campus and would be available during day and night in case of any emergency, is ready and is kept in the administrative department. Computer systems, software and files are backed-up. Duplicate copies of software and files also stored off-site. This work is done by the Assistant Librarian of CSSSC, IDSK and ASI. The library building, collection and the equipments of CSSSC and IDSK are insured. Both libraries get discount from Insurance Company, because both libraries installed Sprinkler systems. But the library building, collection and the equipment of ASI is not insured. All furniture, **pictures, mirrors, shelves and light fixtures are not** attached to the walls or the floor by calm of CSSSC, IDSK and ASI. In both CSSSC and ASI libraries, there was no proper prevention from theft. Anti-theft systems are available at IDSK. All the three libraries use directional signs to alert and communicate with patrons and other offices. All the three libraries installed lightning rods which carries the electrical charge of lightning bolts safely to the ground, greatly reducing the chance of a lightning-induced fire.

Table 10: Precautions Taken for Protection from Disaster in the Science Research Libraries

	BI			IICB			CGCRI		
	Yes	**No**	**Don't Know**	**Yes**	**No**	**Don't Know**	**Yes**	**No**	**Don't Know**
A copy of emergency telephone tree with contact information and detailed instructions	√	-	-	√	-	-	√	-	-
Store Library Data backups off-site regularly	√	-	-	√	-	-	√	-	-
Buildings, collections and equipment's covered by insurance	√	-	-	√	-	-	√	-	-
Attach furniture ,**pictures, mirrors, shelves and light fixtures** to the walls or the floor by calm	-	√	-	-	√	-	-	√	-
Digitize valuable, rare and/or important items	√	-	-	√	-	-	√	-	-
Maintains a record of all disasters happening, their frequency and	-	√	-	-	√	-	√	-	-

consequences									
Has the library any anti theft systems	-	√	-	√	-	-	-	√	-
Use signs to alert and communicate with patrons and other offices	√	-	-	√	-	-	√	-	-
Installed Lightning arrester	√			√			√		

Table 10 shows precautions taken for protection from disaster in the Science Research libraries. All the libraries store library data back-ups regularly. There are installed lightning arrester systems in all the three library buildings to protect them from electrocution during lightning. Only in IICB library, CCTV is installed in front of every entry point of every floor for checking thefts and daily recordings are made by security officer. The other features like insurance coverage, using signs to alert and communicate with patrons and other offices are common in all the libraries. Only CGCRI has a record to note disaster happenings if any.

Table 11: Availability of Disaster Kits in the Social Science Research Libraries

Disaster Kits	CSSSC	IDSK	ASI
Face masks	√	-	-
Rubber boots	-	-	-
Plastic gloves/sheets	√	√	-
Flashlights	√	√	-
Batteries	√	-	-
Weather radios	-	-	-
Mike	√	-	-
Generator	√	√	√
Fire blankets	√	-	-

Table 11 shows that availability of disaster kits in the Social Science Research libraries. The library of Centre for Studies in Social Sciences, Calcutta (CSSSC) has different types of disaster kits such as face masks, plastic gloves, flashlights, batteries, mike and generator and fire blankets. IDSK library has plastic gloves, flashlights and generator but the Central library of ASI has only generator.

Table 12: Availability of Disaster kits in the Science Research Libraries

Disaster Kits	BI	IICB	CGCRI
Face masks	√	√	-
Rubber boots	-	-	-
Plastic gloves/sheets	√	√	√
Flashlights	√	√	√
Batteries	-	-	-
Weather radios	-	-	√
Mike	-	-	-
Generator	√	√	√
Fire blankets	-	-	-

Table 12 shows the availability of Disaster kits in the Science Research libraries. Bose Institute library and IICB library has face masks, plastic gloves, flashlights and generator for use in case of disasters. In CGCRI face masks are missing however weather radios are available. The other things available at CGCRI are plastic gloves, flashlights and generator.

Table 13: Plan Preparation for Different Aspects of Disaster Management in Three Social Science Research Libraries

Items	CSSSC	IDSK	ASI
Building collapse	√	√	-
Book worm	√	√	-
Faulty lightning system	-	√	√
Gas leak	-	√	-
Fire	√	√	√
Terrorist activities	-	-	-
Sabotage	-	-	-
Faulty Electrical Circuits	√	√	√
Leaking water pipes	-	-	-
Air conditioning system	√	√	√
Burst heating pipes	-	-	-
Theft	√	√	-
Paper decay	√	√	-
Insect raids	-	-	-
Cyclone Threat	-	-	-
Collapse of shelving in the library	√	√	-

 Table 13 shows the different aspects of disaster management for which the three social science research libraries prepared the plan. Both CSSSC and IDSK have plans for disaster management in case of building collapse, book worm, fire, faulty electrical circuits, air conditioning system, theft, paper decay and collapse of shelving in the library. In addition to this IDSK is also prepared for faulty lightning system and gas leak. Central library of ASI is prepared for management only in case of faulty lightning system, fire, faulty electrical circuits and air conditioning system.

Table 14: Plan Preparation for Different Aspects of Disaster Management in Three Science Research Libraries

Items	BI	IICB	CGCRI
Building collapse	√	√	√
Book worm	√	√	-
Faulty lightning system	-	√	-
Gas leak	-	√	-
Fire	√	√	√
Terrorist activities	-	-	-
Sabotage	-	-	-
Faulty Electrical Circuits	√	√	√
Leaking water pipes	-	-	-
Air conditioning system	√	√	√
Burst heating pipes	-	-	-
Theft	-	√	-
Paper decay	-	-	-
Insect raids	-	-	-
Cyclone Threat	-	-	-
Collapse of shelving in the library	√	√	√

Table 14 shows plan preparation for different aspects of disaster management in three science research libraries. Among them both Bose Institute and Indian Institute of Chemical Biology libraries have plans for disaster preparedness in case of building collapse, book worm, fire, faulty electrical circuits, air conditioning system and collapse of shelving in the library. In addition to this IICB has

preparation for faulty lightning system, gas leak and theft. However CGCRI library has preparedness only for building collapse, fire, faulty electrical circuits, air conditioning system and collapse of shelving in the library.

So the overall findings reveal that among the two groups of libraries the social science research libraries are having better disaster management approaches. The Institute of Development Studies (IDSK), Kolkata shows the best performance among the lot followed by Centre for Studies in Social Sciences Calcutta (CSSSC). Among the science research libraries Indian Institute of Chemical Biology (IICB) tops the list in disaster management, although it lacks behind IDSK and CSSSC.

12. SUGGESTIONS

- There should be an emergency exit clearly with directional signs showing where to pass in order to avoid confusion and stampede. So the entry and exit point should be clear.
- All the libraries should install fire detector, water sensing alarm and more portable fire extinguishers and maintain drainage and plumbing system.
- There should be regular building inspection to avoid potential hazards.
- The fire extinguishers should be checked at regular intervals and the agency staff should demonstrate how to use them.
- Automatic fire sprinkler system should be installed.
- Electrical wiring system should be checked at regular intervals and separate main switch should be established at each floor of the buildings.
- The libraries should have comprehensive insurance scheme so as to reduce and share the possible risk of loss.
- All furniture, pictures, mirrors, shelves and light fixtures should be attached to the walls or the floor by calm.
- Sunlight should be prevented from falling directly on papers because the sun rays are great emitter of ultraviolet rays. The windows must be provided with colour curtains, which will prevent falling of direct light as well as absorb ultraviolet rays. Lemon yellow or green coloured glass panes should be fitted in window panes as these are more effective in blocking ultraviolet rays. It is extremely good to fit acrylic plastic sheet in the panes of window because it filters out UV rays to a greater extent than coloured glass.
- For checking thefts, CCTV should be installed in the library and daily recordings should be made.
- There should be clear and concise notices pasted at very strategic areas in the library showing how occupants (staff, patrons and visitors) should react to disasters when they strike.
- Disaster management tips should be incorporated into the orientation programmes which are usually organized for new staff and patrons.
- Preventive procedures should be the part of maintenance program of the library.
- Special precautions should be taken during usual period of increased risk such as building renovation.
- Use of match stick or open flame and smoking should strictly be prohibited inside the library. Inflammable materials and chemicals should not be stored inside the stacks.
- The telephone number of the fire office should be visibly and clearly exhibited.
- The library should constitute a disaster management team/committee, which will not only serve as disaster monitor within the library but also as a liaison between the library and the agencies concerned with disaster management in the community so as to be in constant touch.
- The electrical defects and faults should be set right in time.
- Posters like "Do not use the lift but take stair case to reach the open place" in case of disasters should be fitted.
- As high humidity and high temperature are more hazardous for library materials it is advisable to maintain ideal room temperature (200-250 °C) and relative humidity of (RH 45- 55%) for preservation of documents.

- Libraries should maintain a record of all disasters happening, their frequency and consequences.
- Institutions should maintain cooperation with local police and fire fighting station.

Libraries seem to ignore that disaster management can actually support cost reduction in the long run, by avoiding costly damages. For instance, proper shelving protects books from falls and thus spine breakage, proper electrical wiring protects from fires, safe water pipes against flooding, anti theft systems discourage thieves etc. Apart from these proactive measures the most important precaution in a library is staff and user training in order to use the library material properly. For example, handling photographs with cotton gloves protects them against staining, carrying books on trailers protects them against accidental dropping, avoiding writing on books, even in margins, sustains books in a better condition, avoiding the use of metal paper clips protects against oxidation etc. Finally, multiple copies of popular books and cheap photocopying machines are known ways in order to avoid micro vandalisms (such as torn pages and petty thefts).

13. CONCLUSION

Though Disaster management is a complicated and seemingly overwhelming task for any library or archive to undertake, it is necessary for the safety of personnel and library resources should the worst happen. Library and information professionals need to change their attitude and think that disasters can happen anytime and they have to be prepared to deal with them. Although the Social science research libraries show somewhat better performance as compared to their Science counterparts in disaster management approaches but still some more precautions are needed. "Prevention is better than cure" and preventive measures are required to be taken by both the Science and Social Science Research libraries right from the stage of planning the building for the library. These measures are useful for the daily management of the library. Through careful planning and diligence, catastrophic damage can be prevented or minimized and normal operations returned in the event of a disaster. There is a wealth of information written specifically in the field of library and archives that can aid managerial staff in the design and implementation of their own disaster management and recovery plan. This vital organizational tool cannot and should not be ignored, lest the worst become the end of a library or archive, due to lack of preparation and planning.

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OPEN EDUCATIONAL RESOURCES : A PATHWAY TO OPEN MOVEMENT

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1. INTRODUCTION

Educational Resources includes different kinds of digital assets. Learning content includes courses, course materials, content modules, learning objects, collections and journals. Tools include software that supports the creation, delivery, use and improvement of open learning content, searching and organization of content, content and learning management systems, content development tools, and on-line learning communities. Implementation resources include intellectual property licenses that govern open publishing of materials, design-principles and localization of content. They also include materials on best practices such as storage, publication, techniques, methods, processes, incentives, and distribution. OER materials are beginning to get integrated into open and distance education. Some OER producers have involved themselves in social media to increase their content visibility and reputation.

2. CONCEPT OF OER

Open Educational Resources (OER) are teaching and learning materials that are freely available online for everyone to use, whether you are an instructor, student or self-learner. Examples of OER include: full courses, course modules, syllabi, lectures, homework assignments, quizzes, lab and classroom activities, pedagogical materials, games, simulations, and many more resources contained in digital media collections from around the world.

The following definition of OER has been proposed by the William and Flora Hewlett Foundation; OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge.

One report, the OLCOS Roadmap 2012, notes that there is no established definition of OER and prefers to identify three core attributes:

- That access to open content (including metadata) is provided free of charge for educational institutions, content services, and the end-users such as teachers, students and lifelong learners;
- That the content is liberally licensed for re-use in educational activities, favorably free from restrictions to modify, combine and repurpose the content; consequently, that the content should ideally be designed for easy re-use in that open content standards and formats are being employed;
- That for educational systems/tools software is used for which the source code is available (i.e. Free software/open source software) and that there are open application programming interfaces (open apis) and authorizations to re-use web-based services as well as resources (e.g. For educational content RSS feeds).

In a simple way according to Stephen H. Foerster "Open educational resources are materials used to support education that may be freely accessed, reused, modified and shared by anyone."

Although a resource may be accessible for FREE over the Internet, it may be protected by a copyright that does not permit reuse and reproduction for either commercial or non-commercial purposes. For example, PBS.org allows educators to freely use images and text from their website under certain conditions however some of the restrictions mean that many would not consider it a repository of OER. Another example is an Organic Chemistry textbook that is freely available but could not be considered an open textbook due to its copyright restrictions. OER are typically distributed as public domain or with an open license that allows others to share, adapt and use the content freely.

Ideally, OER repositories (such as Open DOAR) should clearly display the policies for inclusion of OER to ensure that the content has some sort of open license that permits sharing and reuse. We will explore this issue further in the Chapter on Fair Use, Copyright, and TEACH Act.

What are educational resources?
- **Digital assets** – normally a single file (e.g. an image, video or audio clip), sometimes called a 'raw media asset';
- **Information objects** – a structured aggregation of digital assets, designed purely to present information;
- **Learning objects** – an aggregation of one or more digital assets which represents an educationally meaningful stand-alone unit;
- **Learning activities** – tasks involving interactions with information to attain a specific learning outcome;
- **Learning design** – structured sequences of information and activities to promote learning.

3. OER OBJECTIVES

OER encourage educators and learners to actively participate in the emerging open education movement. Creating and using open resources should be considered integral to education and should be supported and rewarded accordingly. Open educational resources should be freely shared through open licenses which facilitate use, revision, translation, improvement and sharing by anyone. Resources should be published in formats that facilitate both use and editing, and that accommodate a diversity of technical platforms. Governments, school boards, colleges and universities should make open education a high priority. Ideally, taxpayer-funded educational resources should be open educational resources. Accreditation and adoption processes should give preference to open educational resources.
- Open access to knowledge of the world.
- Creating and Maintaining High Quality open materials.
- Powerful resources for 24/7 open supplemental and lifelong learning.
- Learning by doing.
- Accelerated Learning.
- Immersive teaching environments and powerful educational games.

4. MAJOR OER INITIATIVES

Here is discussed about some major OER initiatives throughout the world.

MIT Open Course Ware (http://ocw.mit.edu/): MIT OCW is an initiative of the Massachusetts Institute of Technology (MIT) to put all of the educational materials from its undergraduate and graduate level courses online, partly free and openly available to anyone, anywhere. MIT Open Course Ware is a large-scale, based publication of MIT course materials starting from political science to aeronautical engineering.

In 1999, MIT Faculty considered how to use the Internet in pursuit of MIT's mission to advance knowledge and educate students and in 2000 proposed for OCW. MIT published the first proof-of-concept site in 2002, containing 50 courses. By November 2007, MIT completed the initial publication of virtually the entire curriculum, over 1,800 courses in 33 academic disciplines. Going forward, the OCW team is updating existing courses and adding new content and services to the site.

It has been incorporated as an independent non-profit organization. The OCW is a community of over 250 universities and associated organizations worldwide committed to advancing Open Course Ware sharing and its impact on global educational opportunity. The mission of the Open Course Ware Consortium is to advance formal and informal learning through the worldwide sharing and use of free, open, high quality education materials organized as courses. Collectively, OCW Consortium members have published materials from more than 13,000 courses in 20 languages.

China Open Resources for Education (http://www.core.org.cn/en/): CORE also a non-profit organization. Its mission is to promote closer interaction and open sharing of educational resources between Chinese and international universities, which CORE envisions as the future of world education.

CORE Open Courseware is a free and open educational resource for faculty, students, and self-learners throughout the world. However, it does not grant credits or degrees, and does not provide access to faculty; it gives you open access to the materials used in a variety of courses.

To share Chinese Quality Courses worldwide, CORE has launched the project of writing "Chinese Quality Open Courseware (CQOCW)" into English in 2006. Since 2006, CORE has selected 27 from 1,500 CQOCW from CORE Member Universities and organized professors to get involved in the translation. Until now, there are 10 English versions of CQOCW are published.

Open Courseware in Japan. (http://www.jocw.jp/): Researchers from the National Institute of Multimedia Education (NIME) and Tokyo Institute of Technology (Tokyo Tech) studied the MIT Open Courseware, leading them to develop an OCW pilot plan with 50 courses at Tokyo Institute of Technology in September. Later, in July 2004, MIT gave a lecture about MIT Open Courseware at Tokyo Tech that prompted the first meeting of the Japan OCW Alliance. In April 20, 2006 Japan Open courseware Consortium (JOCW) has been established. It aims to assist and disseminate the OCW activity, which is an open and a free publication of formal course materials of higher educational organizations, through mainly exchanging information among consortium members. It will encourage interchanging know-how and opinions among not only Japanese's organizations related to the OCW, but also foreign organizations by participating the OCW Consortium as an Affiliate member.
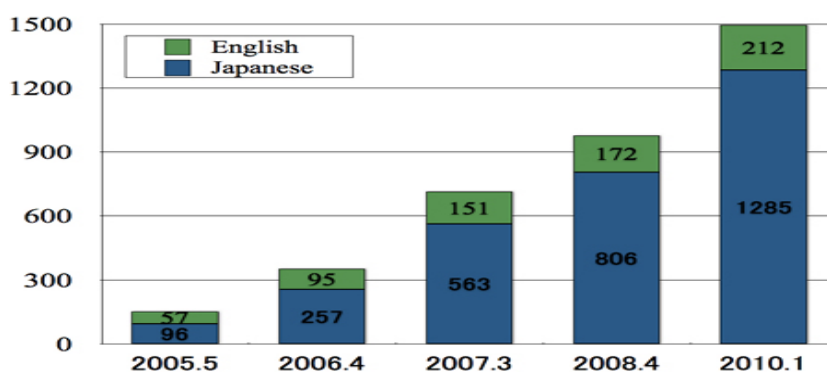
Courses published from all JOCW Universities
(Source - http://www.jocw.jp/AboutJOCW.htm)

National Programmed on Technology Enhanced Learning of India (http://nptel.iitm.ac.in/): NPTEL is a Government of India sponsored collaborative educational programme. By developing curriculum-based video and web courses the programme aims to enhance the quality of engineering education in India. It is being jointly carried out by 7 IITs and IISc Bangalore, and is funded by the Ministry of Human Resources Development of the Government of India. As of January 2012, over 260 courses were available online. The course videos are available in streaming mode, and may also be downloaded for viewing offline. The video files are also viewable via the IIT Channel in YouTube.

5. BENEFITS AND DISADVANTAGES

In the above study of OER, its objectives and different initiatives we can find some of the *benefits* these include;

- Fosters pedagogical innovation and relevance that avoids teaching from the textbook,
- Broadens use of alternatives to textbooks while maintaining instructional quality and
- Lowers cost of course materials for students

Some *disadvantages* of OER include;

- Quality of available OER materials inconsistent,
- Materials may not meet Section 508 ADA accessibility or SCORM requirements and must be modify to bring into compliance,
- No common standard for review of OER accuracy and quality,
- Need to check accuracy of content,
- Customization necessary to match departmental and/or college curriculum requirements,
- Technical requirements to access vary and
- Technological determinism created by the delivery tool

6. CONCLUSION

OERs are highly remarkable to become an aid in the teaching and learning process. Any educational institutions and the teaching community are not only making use of OERs but also contributing moderately towards their development. Still, there is need of adoption of new and appropriate technologies to match the teaching-learning Environment for more development and use of OERs.

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LEADERSHIP COMPETENCIES TOWARDS QUALITATIVE LIBRARY MANAGEMENT

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1. INTRODUCTION

Leadership is one of the most key issues that essentially promotes the practice of librarianship, enhances a librarian's reputation, and helps to fulfill the objectives and goals of the organization. In this regard, Fitsimmons (2007) opines that, "whether you are a solo librarian, in charge of a library department, or oversee an entire research library, your leadership skills and how they are applied set the tone for working relationships and service throughout the library and beyond and the leading librarian's skill as a leader is the single most important factor in determining the health of the operational unit, which cannot help but affect the bottom line – the cost effectiveness of the unit in carrying out its mission. Leadership skills are also one of the few areas that the individual actually has control over, since they can be improved upon". Jantti and Greenhalgh (2012) are of the views that, "to improve its capacity to respond to the issues associated with an ageing workforce within the library and information sector and subsequent leadership drain, the imperative for a given library to create a transparent, integrated approach to succession management and leadership development through the clear articulation of opportunities and expectations for staff wishing to progress to different roles as well as improvement opportunities for those currently content in their existing role". Contextually, Sidorko (2007) remarks that, "the range and complexity of challenges facing libraries and librarians today are unprecedented. Certainly the proliferation of information technologies has made a significant impact on libraries in the way they deliver their services and content as well as the format of that very content as most libraries move towards digital collections or at the very least hybrid print and digital collections. In this environment there is also growing expectations of users for quality, accuracy and immediate responsiveness to their needs".

2. LEADERSHIP: THE CONCEPT

Burns (1978) stated that "leadership is one of the most observed and least understood phenomena on earth". He further added that, "people are imperative to organizational life and they put their efforts in a coordinated way for certain outputs. When people are working together for certain accomplishments, it is natural to form groups. Each group member is affecting the activities of others in one-way or the other. Leadership role ultimately develops within the group formally or informally. Within formal groups having structured interaction and coordination, it is the fundamental role of leader to organize the activities, to motivate the group, to assign the task and finally achieve the targets".

Despite different opinions about the concepts of leadership, it is undoubtedly essential on the part of a human being in a group to possess the quality of leading a group to the successful destination. Prophet Muhammad (Peace be upon him) said, "If there were three in a trip, they must appoint a leader from among them. The gauge of any human group performance can only be set by the performance of leaders. Moreover, in human affairs, the distance between the leaders and the average is a constant. If

the leadership performance is high the performance of the group will go up" (**Drucker, 1996**). A simple, but a useful definition of leadership suggested by Day and Antonakis (2012) is: "leadership is purpose-driven action that brings about change or transformation based on values, ideals, vision, symbols and emotional exchanges". Thus, leadership becomes embedded in the social interactions among employees who are working towards a common goal (Crawley-Low, 2013). Leadership thus constitutes the essential traits of a person to lead his fellow colleague not merely by putting authoritative force but surely through cordial relationship and motivation among his colleagues.

3. NEED FOR LEADERSHIP COMPETENCIES

In order to fulfill the goals and objectives of the organization, a librarian needs to acquire requisite leadership competencies. Jantti and Greenhalgh's (2012) opinion on leadership competencies may be briefed as:

- Leadership helps to clarify someone's intention, objectives, and strategies required for the execution of a successful plan
- It helps to definite standard for professionals with keen leadership ability or attitude to be independently assessed and provided with feedback;
- It helps to implement a certain process to design and develop career strategies and opportunities for those with ability, aptitude, and dedication;
- It helps to provide guidelines for leadership development training and opportunities for existing team leaders;
- It helps to examine the availability of both internal and external coaching and training facilities for targeted staff; and
- It helps to determine the barometers of success.

4. LITERATURE REVIEW

The leadership and organizational development literature is multi-disciplinary and voluminous compared to the more modest literature focusing specifically on leadership and organizational development occurring in libraries. A special issue of Library Trends on organizational development and leadership is edited by Russell and Stephens (2004) and is very helpful. Selected topics discussing the application of organizational development and leadership theory in a library setting include the learning organization by Giesecke and McNeil (2004), organizational culture by Kaarst-Brown, et al (2004), and organizational development by Stephens and Russell (2004). Leadership in libraries is an important ongoing area of interest because there is a requirement to mentor the next generation of library leaders (Branin, 2012; Crawley-Low, 2013). Harris (2011) explored various non-financial ways in which librarians can motivate their fellow subordinate colleagues for raising the level of productivity and satisfaction despite their less salary. Williamson (2008) advocated the greatest challenge of transforming library services, resources and facilities lies in transforming the knowledge, skills and abilities of library staff and to developing new models and approaches to professional practice, which could meet and exceed client expectations and overcome the traditionally conservative approach to the practice of librarianship obviously through effective. The literature discussed here is all about the necessity of fostering leadership competencies in organizational context.

5. IMPORTANCE OF LEADERSHIP DEVELOPMENT PROGRAMME

For individuals and groups, leadership development is the expansion of an individual's capacity to be effective in leadership roles and process. "Leadership is a social process... leadership development can be something we do along the way as part of our work, not something additional we do on the side if we have time" (Gaines, 2012). An effective leadership development program sets the conditions for direction, alignment, and commitment at the individual, group and organizational levels (Crawley-Low, 2013). Each individual is unique. Some are passionate about their professional work while others place higher priorities on other facets of their life, whether by choice or necessity. There will be

individuals who will seek out learning opportunities whether or not they are required to by their organization or a formal professional development (PD) scheme and others who wait for continued professional development as a mission of leadership development programme need to be delivered to them (Cossham and Fields, 2007). Moreover, Leadership development not only helps to enhance the efficiency of the staff but also provides immense benefit in developing the performance and activities of a specific organization.

6. NEED FOR DESIGNING LIBRARY LEADERSHIP DEVELOPMENT PROGRAM (LLDP)

The case of library leadership development program (LLDP) at the University of Saskatchewan (Williamson, 2009) may be taken as an example:

During the entire activities of the program, the participant learn enormously regarding various tricks of management and the steps involved in the process to execute their schemes successfully. These include "their pre-set allocation to trios (teams of three), their self-selection into three teams for Leadership Action Challenges and the writing of a personal reflections journal". In this programme the focal point is on 'the trio' and the 'action challenges' which constitute the unique feature of this LLDP. This is just one year programme design to strengthen the learning objectives supported by leadership skills. This has been proved a useful tool to encourage self-reflecting and documenting thoughts, learning objectives and learning action plans and results. Apparently the programme his very much appreciated by the participants.

Moreover, the intent of forming a trio is to offer delegates with the scope to receive a thorough mentoring that can boost and augment the basic learning objectives from the already chalked out modules. Another striking feature of this programme is that the participants are allowed to interact each other at regular interval and to develop their understanding on the topics better as the time lapses. The most interesting thing happens here is that employee/team issues or personal development plans are brought to the meetings to exchange opinions, and share views with their respective trio colleagues. This example is indeed a model showing the practice of relationship building and developing leadership skills as well.

7. KEY FACETS OF LEADERSHIP

As leadership necessarily requires different traits of leading over complex situations and problems, it is very crucial to identify the key facets that demands leadership. Libraries being the active service zone need effective leadership in its various domains. Some of the prominent areas that seek effective leadership in any library or organization are depicted in figure 1.

Fig. 1: Key Facets of Leadership

Figure-1 illustrates that 'leadership' is the hub around which crucial aspects of successful library management like, *interpersonal relationship*, *manpower management*, *satisfying users*, *satisfying management*, and *time management* depends on.

8. CHALLENGES FOR THE LIBRARY LEADERS

There are a few challenges reported by Sidorko (2007) to enable a greater understanding and appraisal of some of the prominent issues and challenges that a library leader more often comes across:

- So far as qualitative library management is concerned, the first priority of a particular library is to meet increasing demands of the constantly growing student population added with increased research projects, huge manpower requirement, and financial issues. In order to meet these demands a librarian needs to increase the provision of scholarly information and e- resources and more particularly, exploring resource sharing between libraries,
- In order to ensure economy in budgeting, library professionals need to perform more with less investment,
- It is really a big challenge to handle the dynamic and ever increasing nature of digital/electronic materials more particularly the databases incorporating new titles and excluding some existing titles,
- Preparedness for adoption of latest information technologies and the up gradation of the existing service infrastructure to cater to the changing information seeking behavior of library and information users,
- The big uncertainties in government funding and support of manpower resources especially in higher education sector a library leader to lead his team in adversities.

9. LEADERSHIP LEARNING MODEL

In order to practice the art of leadership, the ideal model presented by Crawley-Low (2013) depicted in fig-2 may be followed.
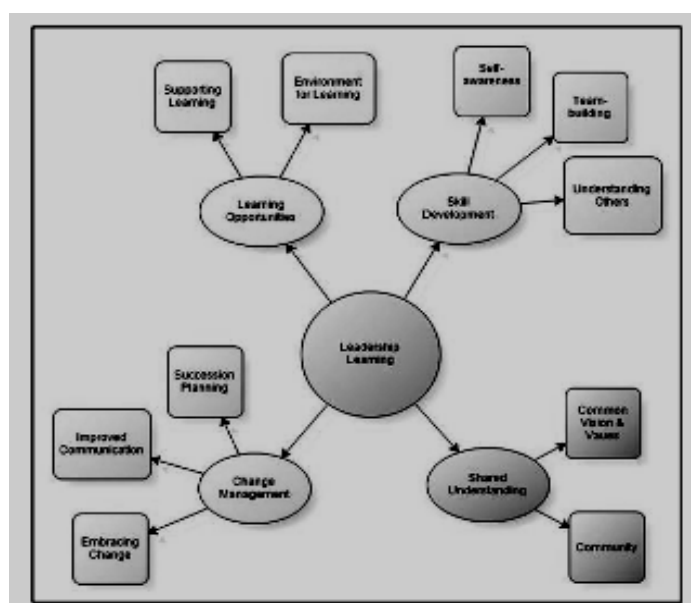

Fig. 2: Leadership Learning Model (Source: Crawley-Low, 2013)

From the learning model presented in fig-2, it is understood that the key activities in a learning organizations are linked in a network fashion to provide holistic approach to an effective leadership in an organizational context.

10. RELATIONSHIP BETWEEN A LEADER AND HIS TEAM MATES

In general sense, each and staff member as an individual must have his/her own needs, targets and goals towards the task s/he is assigned with by his/her boss. Therefore, a leader must show different attitude and different behavior to the person he is supposed to deal with. It depends upon the situations and surroundings. Whatever may be the circumstances, a leader needs to establish perfect interaction with his/her fellow colleagues on day to day basis to ensure that things are progressing smoothly which can build an initial foundation to success. Pierce and Newstrom (2011) are of views that the less technology-savvy and detail-oriented staff can work longer hours on the service desk if their duly motivated with different rounds of conversation with them. Therefore, relationship between a leader and his/her team mates is the most key factor to be considered by a leader to lead his team in an effective and dynamic way.

11. EFFECTIVE LIBRARY LEADERSHIP

Due to constant increase in the students' population, increase in collection of library resources and services, it has become inevitable for an organization to put an effective leader with all the required qualities in him/her as the library manager. Schmidt (2007) mentions the following qualities that an effective leader must possess:

- A leader must be cool and calm with a good sense of humor;
- S/he must possess the strategic vision to contribute to the success of the organization in future;
- A leader must have the ability to quickly adopt to the changing situations;
- S/he should have the soft skills to communicate complex ideas precisely, simply, and clearly to his colleagues and the audience; and
- S/he should create avenues for rewards and benefits to the potential workers with exquisite performances.

Dewey (2005) in her views on leadership and university libraries addressed the requisite characteristics of a leader. She referred to type 'A' characteristics of an effective leader. According to her, "a leader must be *agile*, *analytical*, *assertive*, *adaptable*, *appreciative* and with the ability to *ask*". Therefore, an effective leader is supposed to possess the above mentioned qualities besides being honest, sincere, and dutiful.

12. CONCLUSION

A number of reasons have made it imperative to hone leadership skills. Most importantly, leadership sets a milestone in our commitment to quality and service excellence and best practice. Without dynamic leadership, good management is never at all possible. A leader can only inspire his fellow colleagues to follow his foot prints if he sets a perfect example for his subordinates through his actions, planning and execution of his sublime ideas into real practice. Therefore, vibrant administration of the library comes from good leadership of a dynamic library administrator whom we call as an effective leader. As opined by Noe (1986), "library managers asking staff to take on additional responsibilities as a result of staff attrition, service point mergers, or other factors should take into account the organizational behavior research demonstrating that ability to learn effectively is related to motivational and environmental influences, and not necessarily finances". While stressing the importance of motivational influence Harris (2011) emphasizes that, "library units that redistribute work and rely only on those staff who possess demonstrated competencies, without training the entire body of staff who share the same job description may well see the motivation and productivity of their staff members decline". Hence, it is quite demanding on the part of a library manager to develop leadership competencies so that they can inspire, motivate, train and teach the fellow professionals to deliver the best services towards the mission objectives set by the organization they serve.

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MANUSCRIPT
LIBRARIES IN TAMIL NADU : AN OVERVIEW

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1. INTRODUCTION

Manuscripts have captured the attention of world scholars for centuries for its knowledge content. Form India, Chinese traveler Hiuen Tsang had taken hundreds of manuscripts. King George III of England was fortunate to receive an illuminated manuscript of the padshenama which is considered to this day as one of the finest piece of collection in the Royal Collection housed in England.

Manuscripts play a pivotal role in helping the scholars in the process of knowledge evolution by unearthing the literary treasure hidden in them. Manuscripts were used to be collected by scholars as the scholarship of scholars was used to be measured by their personal collection of manuscripts. It is interesting to note that the dire need for the search of manuscripts had been felt in many countries by an individual who was subsequently taken over by well conceived institutions for this purpose with an organised built in structure. India is no exception to this practice of preserving manuscripts.

2. MANUSCRIPT LIBRARIES IN INDIA

In Ancient India, the literary treasures in the form of manuscripts were housed and preserved in the houses of learned scholars, gurukulas of learned pandits, pthashalas, ashrams, mathas (Mutts), monastries, temples vichars and royal palaces who patronaged the art and literature. These manuscripts libraries were also called as sarasvati bhandar, grantha kothi, jnana bhandar, pustaka bhandar, bharati bhandar. Nalanda University, Taxila Vishava Vidhyalaya library, Vikramshila University library, Library of Valabhi, Nagarjuna Vidhya peetha Library are some of the famous manuscript libraries in ancient India. During the Muslim rule also the Kings had set up personal libraries in their palaces and mosques.

Scholars from the western countries were fascinated by the knowledge content of the manuscripts in India which led to the Oriental Research in India, Universities in different parts of India. Documentation of the availability of manuscripts in order to make them public was envisaged by them. This led to the publication of catalogues in a descriptive manner. Government Oriental Manuscript Library, Chennai; Adyar Library, Chennai; Saraswati Mahal Library, Tanjore; Oriental Research Institute, Mysore; Oriental Research Institute, Sri Venkateswara University, Tirupati; Anup Sanskrit Library, Bikaner, Vrindaban Research Institute, Vrindavan; Asiatic Society Library, Kolkatta; Saraswathi Bhavan Library, Varanasi; Oriental Institute, MS University, vedodara; The Bhandarkar Oriental Research Institute, Pune; Central Institute of Buddhist studies, LEH; French Institute of Indology, Puduchery; Khuda Bakshsh Orinetal Public Library, Patna; Rajasthan Oriental Institute, Jodhpur; Ranpur Raja Library, Ranpur; Krishna Kanta Handiqui Library, Guwahati; Lalbhai Dalpatbhai Institute of Indology, Ahemedabad; Vishveshavarandan Biswasbhandhu Institute of Sanskrit and Indological Studies, Hoshiarpur; Scindia Oriental Research Institute, Virkram University, Ujjain; Department of Manuscritology, Kannada University, Hampi, Kurukshetra University, Kurukshetra. Library of Tibetan Works and Archives, Dharmasala and Thunchan Memorial Trust, Trisur are some of the Manuscript Libraries which are referred avidly by scholars from India and abroad.

3. MANUSCRIPT LIBRARIES IN TAMIL NADU

The website of French Institute of Indology, Pondichery[1], has listed 36 (Table 1) manuscript libraries in Tamil Nadu. The website of also has listed the list of 192 private individual persons holdings of the manuscripts in Tamil Nadu.

Table 1: List of Manuscript Libraries in Tamil Nadu

S. No.	Name of the Library	District
1	Dr.U.V.Swaminatha Iyer Library	Chennai
2	Central Research Institute for Siddha Medicine	Chennai
3	International Institute of Tamil Studies	Chennai
4	Saraswati Mahal Library, Thiruvavaduthurai adheenam	Tanjore
5	Raja Veda Patasalai	Tanjore
6	Kasimatham	Tanjore
7	Tiruvidaimarudur Kovil Devasthanam	Tanjore
8	Malayala Krishnaiyar Padasalai	Madurai
9	V.V.V.College	Virudhunagar
10	Tamil Nadu Theological Seminary	Madurai
11	Kunampatti Adhinam	Coimbatore
12	C.P.Ramaswamy Foundation	Chennai
13	Suthamalli Padasalai	Tirunelveli
14	Government Museum Palani	Dindigul
15	Saurashtra Sabha	Madurai
16	Government Museum Madurai	Madurai
17	Department of Tamil Studies, Madurai Kamaraj University	Madurai
18	Sri Kumara Thevar Matam, Viruthachalam	Cuddalore
19	Sri Kumara Thevar Matam, Thuraiyur	Trichy
20	Annamalai University	Chidambaram
21	Government Oriental manuscript Library	Chennai
22	Government Museum, Erode	Erode
23	Kalaimakal Kalvi Nilayam, Erode	Erode
24	Kuppu Swami Sastry Research Institute	Chennai
25	Sridhara Venkatesa Aiyyaval Matham, Thiruviyalur	Thiruvarur
26	Tirumanturai Amra Vanesvara Tirukkovil, Lalgudi	Trichy
27	Vanamamalai Matham, Nanguneri	Tirunelveli
28	Govindapuram Matham, Kumbakonam	Tanjore
29	Velakkurcci Adheenam, Tirupugalur	Nagappattinam
30	Sri Kaumara Matham, Chinnavedampatti	Coimbatore
31	Svamprakasa Swamikal Matham, Thirumazhapadi	Tanjore
32	Kovilur Matham, Karaikudi	Sivagangai
33	Sankarameshvarar Kovil Devasthanam, Thoothukudi	Thoothukudi
34	Sri Ranganatha Paduka Vidyalaya, Srirangam	Trichy
35	P.S.Krishna Iyer Memorial Trust, Nainaragaram	Tirunelveli
36	Dharumapuram Adheenam, Myladuthurai	Nagappattinam

The 36 manuscript libraries (Chellamuthu, 1989) located in fourteen districts of Tamil Nadu have been grouped under the following five categories based on the nature of management of library.

- Manuscript Libraries governed by Tamil Nadu State Government
- Manuscript Libraries governed by Universities
- Manuscript Libraries governed by Autonomous Institutions
- Manuscript Libraries governed by Religious Institutions
- Manuscript Libraries governed by Private Institutions

The following aspects have been considered in the descriptive analysis of the manuscript libraries under the study.

- Name of the Manuscript Library, location and year of establishment
- Status of the Manuscript Library
- Quantum of Collection
- Library Staff Strength
- Microfilming and Digitisation Initiatives

4. MANUSCRIPT LIBRARIES UNDER STUDY MANAGED BY TAMIL NADU STATE GOVERNMENT

There are six manuscript libraries one each in six districts namely Dindigul, Madurai, Chennai, Erode, Trichy and Thoothukudi which are managed by State Government. Table 2 reveals the state of the art of manuscript libraries under study managed by Tamil Nadu State Government with respect to their name, place of location, year of establishment, status, quantum of collection (print and other forms), staff strength, microfilming and digitisation initiatives.

Table 2: State-of-the-Art of Manuscript Libraries Managed by Tamil Nadu State Government

S. No.	Name of the Library, Location and Year of Establishment	Status	Quantum of Collection	Staff strength	Microfilming/ Digitisation Initiatives
1	Government Museum, Palani, Dindigul District, 1997	State Government	Palm Leaf = 32 Journals = 5	Curator =1 Assistants=2	Digitisation
2	Government Museum, Madurai, Madurai District 1981	State Government	Palm Leaf = 28 Journals = 5	Curator=1 Assistants=2	-
3	Government Oriental Manuscript Library, Chennai District 1869	State Government	Palm Leaf = 50289 Paper=22354 Books=25373 Journals=46	Curator=1 Librarian=1 Language Experts = 10 Administrative Staff = 8	Digitisation and Microfilming
4	Government Museum, Erode, Erode District, 1987	State Government	Palm Leaf=300 Journals =5	Curator=1 Assistants=2 Clerk=1 Administrative staff=3	-
5	Tirumanturai Amravanesvara Tirukkovil, Lalgudi Trichy District 1934	State Government	Palm Leaf=1 Paper=3 Books=60 Journals=10	Assistant=1 Administrative staff=1	-
6	Sankarameshvarar Kovil Devasthanam, Thoothukudi, Thoothukudi District 1960	State Government	Palm Leaf=42 Books=400 Journals=8	Assistant =1 Administrative Staff=1	-

These Six government libraries are located in six districts in Tamil Nadu. An overview of manuscript libraries managed by Tamil Nadu State Government is as follows:

Government Museum, Palani: This library located in Dindigul district. It works on six days a week and eight hours daily. Fridays, second Saturdays and national public holidays are holidays. Entrance fees is collected. Commissioner of Museum, State Government is its Administrative Head. The library has thirty two palm leafs in works like matras, literature, medicine and religion apart from one hundred and eighteen palm leafs which are in bad condition and not allowed to refer. Exhibits of palm leafs are displayed in a glass panel which attracts viewers.

Government Museum, Madurai: The Government Museum is located in the compound of Gandhi Museum in Madurai. This museum was established during the 5th World Tamil Conference held in 1981. The various sections in the museum deal with archaeology, anthropology, zoology, numismatics, botany and geology. It has a fine collection of bronzes, sculptures, musical instruments and paintings. Training sessions and summer training camps on arts, music and crafts are held here. The museum is open on all days except Fridays, second Saturdays and public holidays. Commissioner of Museum is the Administrative head. This has only twenty eight works of palm leafs in Mantras and Religion.

Government Oriental Manuscript Library, Chennai[2]: The library was established in the year 1869. The collections of colonel Colin Mackenzie (1754-1821), Dr.Leyden and Mr.C.P.Brown constitute the nucleus of the vast collections of manuscripts in this Library. The collection consists of manuscripts of works in literature, history, philosophy and science. Multilingual bulletin is published annually which contains inprint rare and unpublished manuscripts in various languages. The library is headed by the curator under the administrative control of Director of Archaeology, Government of Tamil Nadu. Manuscripts and books are issued to visitors for study or consultation on request. Permission is accorded to research scholars for studying, copying and comparing the manuscripts. The library is located in the western wing of first floor of Madras University Library, Chepauk Campus, Chennai. It is kept open from 10 AM to 5.45 PM on all working days and shall remain closed on Fridays and Saturdays and on government holidays.

Government Museum, Erode: This library was established in 1987. It has collections on bronzes, sculptures, paintings, pre-historic objects, palm leaf manuscripts and the like. It works on all the days but for Fridays, Saturdays and national holidays. Commissioner of Museums is its administrative head. This library has three hundred works of palm leaf manuscripts in religion, mantras, puranas and kavyas.

Thirumanthurai Amvaravanesvara Thirukkovil, Lalgudi: This is situated in Trichy District and established in 1934. It is governed by State Government. It works for six hours on all the days. It has palm leaf manuscript in Sanskrit with grantha script and two paper manuscripts and one in Sanskrit regarding the Talapurana of the temple. It has only sixty books. All of them have been received as donations only. Ten journals are being received. The uniqueness of these manuscript collections is that it has only collection about its temple stalapurana.

Sankaramesvar Kovil Matham, Thoothukudi: It was established in the year 1960. Assistant Commissioner of Hindu Religious and Endowment Board is the administrative head. It works for six hours on all the days. It is open to all on free. It has six hundred square feet in which forty two palms leaf and four hundred books are housed. The library receives eight journals. Devotees and research scholars use this library.

5. MANUSCRIPT LIBRARIES UNDER STUDY MANAGED BY UNIVERSITIES

There are two manuscript libraries in two districts namely Madurai and Cuddalore which are managed by universities. Table 3 reveals the state-of-the-art of manuscript libraries managed by universities with respect to their name, place of location, year of establishment, status, quantum of collection (print and other forms), staff strength, microfilming and digitisation initiatives.

Table 3: State-of-the-Art-of Manuscript Libraries Managed by Universities

S. No	Name of the Library, Location and Year of Establishment	Status	Quantum of Collection	Staff strength	Microfilming and Digitisation Initiatives
1	Department of Tamil Studies, Madurai Kamaraj University, Madurai, Madurai District, 1972	University	Palm Leaf=330 Books=4930 Journals=36	Assistant =1 Language Expert=4 Administrative Staff=2	Digitisation
2	Annamalai University, Annamalai Nagar, Chidambaram, Cuddalore District, 1920	University	Palm Leaf=927 Paper =29 Books=531000 Journals=271 Grammaphone and cassettes =3300 Back volume=7700 CDs=300	Librarian=1 Library staff=19 Administrative staff =55	Digitisation and Microfilming (Green stone open source Software)

An overview of manuscript libraries managed by Universities is as follows:

Department of Tamil Studies, Madurai Kamaraj University, Madurai: The Chairperson, Department of Comparative Literature, Madurai Kamaraj University is the administrative head. The library works from Monday to Friday for eight hours a day. It is open to all without any fees and has three hundred and thirty works of palm leafs in medicine, fine arts, puranas, religion and the like and has 4930 books. It subscribes thirty six journals, and used by research scholars, university students and other academic professionals.

Annnamalai University, Chidambaram[3]: The seed of the main library germinated in 1920 with a token deposit of 200 books, when Sri Meenakshi College was founded. Then it was initially housed in the eastern wing of the Administrative building. It moved into its present abode in 1959, opening a new chapter in its history. The building The building was designed by internationally reputed architects namely Messers. Prynne, Abbot, and Davis and was named after the former Vice Chancellor of Annamalai University, Dr.C.P.Ramaswamy Aiyar, in recognition of his valuable services to the country and to this university. The photocopy service available inside the library is useful for the researchers to get xerox copy of the collections.

The Library is kept open from 8 a.m. to 8 p.m. daily, and the Central Reading Hall is kept open upto 10 p.m. during the days prior to the examinations. The Library works throughout the year, on all Sundays, and on all holidays (except National Holidays). The library has 927 works of palm leafs and twenty nine works of paper manuscripts in religion, philosophy, puranas, medicine and the like. The library receives 271 journals.

6. MANUSCRIPT LIBRARIES UNDER STUDY MANAGED BY AUTONOMOUS INSTITUTIONS

There are five manuscript libraries located in four districts namely Madurai, Erode and Virudhunagar each having one library and Chennai district having two libraries which are managed by autonomous Institutions. Table 4 reveals the state-of-the-art of manuscript libraries under study managed by autonomous institutions with respect to their name, place of location, year of establishment, status, quantum of collection (print and other forms), staff strength, microfilming and digitisation initiatives.

Table 4 : State-of-the-Art of Manuscript Libraries Managed by Autonomous Institutions

S. No	Name of the Library, Location and Year of Establishment	Status	Quantum of Collection	Staff strength	Microfilming and Digitisation Initiatives
1	Sourastra Sabha, Madurai, Madurai District 1895	Societies Registration Act	Palm Leaf=260 Paper=110 Books=3000 Journals=25	Assistant =1 Administrative staff=1	-
2	Kalaimakal Kalvi Nilayam, Erode, Erode District 1945	Societies Registration Act	Palm Leaf=108 Books=25570 Journals=25 CDs=60 Back volume=5000	Librarian=1 Administrative Staff=3	Digitzation
3	Central Research Institute for Siddha Medicine, Chennai, Chennai District 1979	Central Government	Palm Leaf=503 Books=3100 Journals=22 CDs=50 Microfilm=10	Director =1 Research Officers=3 Administrative Staff=4	Digitisation and Microfilming
4	International Institute of Tamil Studies, Chennai, Chennai District 1972	Tamil Nadu State Government	Palm Leaf=949 Paper=59 Books=93243 Journals=56	Director=1 Librarian=1 Assistants=3 Language Experts=10 Administrative staff=10	-
5	V.V.V College, Virudhunagar, Virudhunagar District 2008	Societies Registration Act	Palm Leaf=1200 Books=5000 Journals=30 CDs=60	Librarian=1 Language Experts = 4	Digitisation

An overview of manuscript libraries managed by Autonomous Institution is as follows:

Sourashtra Sabha, Madurai: It is established in the year 1895 under the Societies Registration Act with Secretary being its Administrative head. It works from Monday to Saturday and Sunday being a holiday. Entry to the library is restricted to certain people. The library is functioning in its own land with own building. Donations are accepted. The library has eight hundred square feet. The library has two sixty works of palm leaf and hundred and one hundred and ten works of paper manuscripts in fine arts, literature and religion. The library receives twenty five journals. The library was started for the benefit of Sourashtra Community, however, the library is now being used by people belonging to all communities.

Kalaimakal Kalvi Nilayam, Erode: This institution was founded in the year 1945 and has been registered under the Societies Registration Act. This is an autonomous institution. It is open to all without any fees. It has hundred and eight works on palm leafs mostly on local documents, historical documents, grammar, literature, mathematics and the like. The library receives twenty five journals. It is being used by the students and research scholars. The institute has an excellent museum based on the collections of the palm leaf and on archaeology.

Central Research Institute for Siddha Medicine, Chennai: The library was established in the year 1979, by the Government of India. Director is the Administrative Head. The library works on week

days only. The library is open to all. It is functional in its own building with donated land. Indian Government is funding the library. The library has 950 square feet. Research officers with MD (SIDDHA) qualification is appointed temporarily as Librarian. The institute has one Superintendent, one Clerk, and two Office Assistants. It has 3473 works in as many as thousand five hundred bundles of palm leaf manuscripts and details for 503 palm leaf works are available completely. The library has three thousand hundred books in Tamil and English language and subscribes to twenty two journals. Medicine and Philosophy are the important areas in which palm leafs and books are available. The unique collection on Siddha system of medicine in the library proves useful to the Users of different categories, from various disciplines for research purpose as well as for projects at graduate and post-graduate levels, all over the world. The library holding the Siddha texts, rare/old Siddha books, allied medical books such as Pathology, Biochemistry, Pharmacology, Pharmacognosy, Chemistry and Pharmaceutical books and also journals on these subjects. It is planned that Palm leaves manuscripts are going to be digitised.

International Institute of Tamil Studies, Chennai: The library was established in the year 1972. The library works for eight hours a day on all the week days, and open to all. The library is housed in three thousand five hundred square feet area. It has 949 works of palm leaves contained in 674 bundles of subjects like philosophy, religion, medicine, minor literature and the like. 59 paper manuscripts works are there in 27 registers in which medicine, religious works are more (Mahalakshmi 1998)[4]. The library has approximately one lakh collections of books and subscribes to fifty six journals. The library is avidly used by Tamil research scholars across the globe. Chief Minister of Tamil Nadu has a direct control over the Institute.

V.V.Vanniya Perumal College for Women, Virudhunagar[5]: The library of this autonomous college was established in the year 2008. This has been registered under the societies registration act with principal as the administrative head. The library works for eight hours daily from Monday to Friday. The library is attached to the Tamil Department of the College. The library has a restricted entry however without any fees. The library is functioning in its own land and own building with four hundred square feet. The library accepts palm leaves on donation. The library has 1200 works of palm leaves and 5000 books in medicine, literature, grammar, kavyas and philosophy and subscribes thirty journals. The library is used by the students of the college and other Tamil scholars.

7. MANUSCRIPT LIBRARIES UNDER STUDY MANAGED BY RELIGIOUS INSTITUTIONS

There are nineteen manuscript libraries which are managed by Religious Institutions, out of which, six libraries are in Tanjore district, two each are in Madurai, Coimbatore, Tirunelveli, Trichy and Nagapattinam Districts and one each in Cuddalore, Thiruvarur and Sivagangai Districts. Table 5 reveals the state-of-the-art of manuscript libraries under study managed by Religious Institutions with respect to their name, place of location, year of establishment, status, quantum of collection (print and other forms), staff strength, microfilming and digitisation initiatives.

Table 5: State-of- the-Art-of Manuscript Libraries Managed by Religious Institutions

S. No.	Name of the Library, Location and Year of Establishment	Status	Quantum of Collection	Staff Strength	Microfilming and Digitisation Initiatives
1	Saraswati Mahal Library, Thiruvavduthurai Adheenam, Tanjore District 1895	Religious Institution	Palm Leaf = 1931 Paper = 169 Books = 50050 Journals = 35	Assistant = 2	Microfilming and Digitisation

			Special Collections = 11		
2	Rajaveda Patasalai, Kumbakonam, Tanjore District 1542	Societies Registration Act	Palm Leaf = 62 Paper = 48 Books = 5116 Journals = 12	Assistant=1 Language Expert = 1	-
3	Kasi Matham, Thirupananadal, Tanjore District 1811	Religious Institution	Palm Leaf = 38 Paper = 94 Books = 3600 Journals = 32	Assistant=1	-
4	Tiruvidaimarudur Kovil Devasthanam, Tiruvidaimarudur, Tanjore District 1890	Religious Institution	Palm Leaf = 38 Paper = 10 Books = 480 Journals = 20	Assistant =1	Digitisation
5	Malayala Krishnaiyar Padasalai, Cholavanadan, Madurai District 1881	Trust Act	Palm Leaf = 128 Paper = 22 Books = 4000 Journals = 10	Assistant=1 Language Expert = 1	-
6	Tamil Nadu Theological Seminary, Madurai, Madurai District 1986	Societies Registration Act	Palm Leaf =179 Paper = 92 Parchment = 2 Books = 61200 Journals=186 Special Collections = 631 CDs = 120 Thesis = 2000	Librarian=1 Assistant=3 Language Experts = 3 Administrative staff = 3	-
7	Kunnampatti Adhinam, Palle Koundanpalayam, Coimbatore District 1912	Religious Institution	Palm Leaf = 202 Paper = 70 Books = 1000 Journals = 20	Assistant = 1	-
8	Suthamalli Padasalai, Suthamalli, Tirunelveli District 1868	Societies Registration Act	Paper = 25 Books = 1000 Journals = 10	Assistant =1	-
9	Sri Kumara Thevar Matham, Vriddachalam, Cuddalore District 1943	Religious Institution	Palm Leaf =120 Books = 800 Journals = 15	Assistant =1	-
10	Sri Kumara Thevar Matham, Thuraiyur, Trichy District 1943	Religious Institution	Palm Leaf = 450 Books =525 Journals = 15	Assistant = 1 Administrative staff = 1	-
11	Sridhara Venkatesa Aiyyaval Matham, Thiruviyalur, Thiruvarur District 1687	Trust Act	Palm Leaf =1 Books = 1000 Journals = 12	Assistant = 1	-

12	Vanamamalai Matham, Nanguneri, Tirunelveli District 1934	Societies Registration Act	Palm Leaf = 60 Books = 10000 Journals = 32	Assistant = 1	-
13	Govidapuram Matham, Kumbakonam, Tanjore District 1978	Trust Act	Palm Leaf= 60 Paper = 65 Books = 1452 Journals = 10	Assistant = 1	-
14	Velakkuricci Adheenam, Thirugpugalur, Nagappattinam District 1497	Religious Institution	Palm Leaf = 228 Books = 2000 Journals = 20	Assistant = 1 Administrative staff = 1	-
15	Sri Kaumara Matham, Chinavedampatti, Coimbatore District 1909	Societies Registration Act	Palm Leaf = 460 Books = 6554 Journals = 8	Librarian = 1 Language expert = 1	Microfilming
16	Svayamprakasa Swamikal Matham, Thirumazhapadi, Tanjore District 1935	Societies Registration Act	Palm Leaf= 50 Books = 150 Journals=5	Assistant =1	-
17	Kovilur Matham, Karaikudi, Sivagangai District 1818	Societies Registration Act	Palm Leaf = 450 Books = 14000 Journals = 20	Librarian = 1 Language Expert = 1 Administrative Staff = 1	Digitisation
18	Sri Ranganatha Paduka Vidhalaya, Srirangam, Trichy District 1967	Trust Act	Palm Leaf = 30 Books = 10000 Journals =24	Director=1 Language Experts = 3	-
19	Dharumapuram Aheenam, Mayiladuthurai, Nagapattinam District 1861	Societies Registration Act	Palm Leaf= 200 Books = 10000 Journals =25	Assistant = 1	-

An overview of the libraries listed in Table 5 is as follows:

Saraswathi Mahal Library, Thiruvavaduthurai Adheenam, Tanjore District: This library comes under the direct control of Guru Mahasannidhanam who is the Pontiff of Thiruvavaduthurai Adheenam. The library was established in the year 1895, and works on all the days from Monday to Saturday except Sunday. The entry to the library is free with a restricted entry. The library is housed in three thousand eight hundred square feet. It has palm leaf and paper manuscripts in Tamil language (Hiko Saka and Samuel, 1993)[6], Sanskrit language (Srinivasan, 2001)[7]and Telugu language on grammar, literature, minor literature, philosophy and religion.

Raja Veda Patasalai, Kumbakonam[8]: Raja Veda Patasalai is in Kumbakonam of Tanjore District. This religious institution is registered under the Tamil Nadu Societies Registration Act. It works for eight hours on all seven days under the supervision of a Principal. The library is open to all and there is no fee. The library is housed in thousand eight hundred square feet with one floor. The library has bequeathed manuscripts and has received donations. Works on literature, mantras, religion contained in manuscripts and books attract users. The students of patasalai and the teachers use this library regularly ever since its inception from the year 1542.

Kasi Matham, Thirupanandal: It is one of the important Saivaite Mutt located in Thirupanandal, Tanjore District. The library was established in the year 1811, and works on all the seven days for eight hours. Mahasannidhanam of Thirupanandal Mutt is the Administrative head. It is open to all and without any fees. The area of the library is six hundred square feet. The library has collection on philosophy, religion, literature and grammar mostly in Tamil Language. Exponents in Saiva Siddhanta are greatly benefited by the holdings of the library.

Thiruvidaimarudur Kovil Devasathanam, Thiruvidaimarudur, Tanjore District: The library was established in the year 1890. Guru Mahasannidhanam of Thiruvavaduthurai Adheenam is the administrative head. The library works for six hours on all the days in a year and open to all without any fees. The area of the library is four hundred square feet. The library has palm leaf and paper manuscripts and books in Tamil language mainly on puranas, mantras, and philosophy. The library receives twenty journals.

Malayala Krishna Iyer Veda Patasalai, Cholavandan: The library was established in the year 1881. This religious library has been registered under the Trust Act. It works on six days a week for seven hours each day. The library is housed in four hundred square feet. It has palm leaf and paper manuscripts having works in philosophy, religion, veda and vedantic treatises, in Sanskrit language. The library is used by its inmate students and Sanskrit scholars.

Tamil Nadu Theological Seminary, Madurai: It was started in the year 1986. This religious institution is registered under the Tamil Nadu Societies Registration Act with the Principal as its Administrative Head. The library works for eight hours during week days and four hours during Saturdays. The library is open to all without any fees. The area of the library is three thousand six hundred square feet with one floor. One librarian supported by three staff work in the library. The library has two bundles of parchment in Hebrew language, 179 works contained in hundred and twenty five palm leaves and ninety two works in paper manuscripts. The library has sixty five boxes in which 631 are diocese records are housed (Larbeer, 2009)[9]. The library has 61200 books and 186 journals in Tamil, Sanskrit, Telugu, Kannada, Malayalam and English languages. Users from all over the world come and get benefitted from all the informative materials which are being housed in this library.

Kunampatti Adhinam, Palle Koundan Palayam, Coimbatore: The library of the Kunampatti Adhinam was established in the year 1912. This religious library works under Silasri Guru Mahasanidhanam, Pontiff of this Mutt. The library works for six hours on all the days. The library has a restricted entry for the users of the library. The library is functioning in its own building. The area of the library is three hundred and fifty square feet. The library has palm leaf and paper manuscripts and rare collection of books on puranas, mantras, philosophy and religion. General public with religious faith can also use this library.

Suthamalli Patasalai, Tirunelveli: This religious institution is registered under Tamil Nadu Societies Registration Act with its secretary being its administrative head. It works on all the seven days. The library has a restricted entry functioning in its own building with its own land. The library has only paper manuscripts and does not have palm leaf manuscripts. It is being used by the students of the pathasalai, research scholars and general public. Books on mantra, philosophy, veda and Vedanta attract users in this library. The library subscribes ten journals.

Sri Kumara Thevar Matham, Viruddhachalam, Cuddalore: Pontiff of Sri Kumara Thevar Matham is the administrative head. It works for six hours on all the seven days. It is open to all. It has palm leaf collections and books on religion and philosophy. The library receives fifteen journals.

Sri Kumara Thevar Matham, Thuraiyur, Tiruchirapalli: Pontiff of Sri Kumara Thevar Matham is the administrative head. It works for six hours on all the seven days. It is open to all. It has palm leaf

and books on religion and philosophy. The library receives fifteen journals.

Sridhara Venkatesa Aiyyaval Matham, Thiruviyalur, Thiruvarur District[10]: It is a religious institution registered under Trust Act. It works on eight hours on all the seven days. It is open to all without any fees. This library has only one palm leaf in Sanskrit language on Ramayana. It has books in Tamil and Sanskrit. The library subscribes twelve journals. Most of the carnatic musicians visit this library.

Vanamamalai Matham, Nanguneri, Tirunelveli District: This religious institution is registered under Societies Registrations Act. The pontiff of Vanamamalai Matham is its administrative head. It works for six hours on all the seven days. Vaishnava scholars use this library and get benefitted from the sixty palm leaf works and books over ten thousand in literature, puranas, philosophy, veda and vedanta. The library receives thirty two journals.

Govindapuram Matham, Govindapuram, Kumbakonam District: This is situated in Kumbakonam district. It was established in the year 1978 under the Trust Act. It works for six hours on all the seven days. The library has five hundred and twenty square feet. The library has sixty palm leaf works and sixty five paper manuscript works mainly on kavyas and philosophy. The devotees who come to the mutt use these manuscripts and books. It receives ten journals.

Velakuricci Adheenam, Thirupugalur, Nagapattinam District: This is Siddhanta Mutt. Thiruvalar Sannidhanam is the Pontiff who is the administrative head of this library. This religious library works for six hours on all days. The library has two hundred and twenty eight palm leaf works and two thousand books. It receives twenty journals.

Sri Kaumara Matham, Chinna Vedampatti, Coimbatore District[11]: This religious institution was established in the year 1909, registered under the Societies Registration Act. Pontiff, Sri Kaumara Matham is its administrative head. It works for 6 hours on all days. It has a qualified librarian. The area of the library is thousand three hundred square feet. It has a collection of four hundred and sixty palm leaf works of which most of them belong to religion and all of them have been microfilmed. Books and palm leaf collections attract users to this library. Eight journals are being received in this library.

Swayamprakasa Swamikal Matham, Thirumazhapadi: It was established in 1935. This religious institute is registered under Societies Registration Act. It works for six hours on all days. Srilasri Swayamprakasa Swamikal is the administrative head. It is open to all and entry is free. The library has fifty works in the form of palm leaf manuscripts and out of which twenty seven deals with house hold accounts only completely. This is a siddhanta mutt. It subscribes five journals. The books in this mutt are only a small collection limited to one hundred and fifty only, and most of them pertaining to religion.

Kovilur Matham, Kovilur: It was established in 1818. This religious institute is registered under Societies Registration Act. It works for six hours on all the seven days. Pontiff, Kovilur Matham is its administrative head. It is open to all and free. It is functioning in its own land and own building. The library has one thousand and eight hundred square feet. The library has housed four hundred and fifty palm leafs with most of pertaining to Vedanta which are very neatly kept. The library receives twenty journals. The library has rich collections of vedantic books. The library has a qualified librarian.

Sri Ranganatha Paduka Vidhyalaya, Srirangam: It was established in the year 1967. This religious institution registered under Trust Act works for six hours on all the days with Principal of the Vidyalaya as its administrative head. The entry is restricted but without any fees. The area of the library is six hundred square feet. This library has donated seventy one bundles of palm leafs to Srimath Andavar Ashramam. They have only twelve palms leaf bundles having thirty works which are on vaishnava philosophy. This library is being used by vaishnava scholars. The library has ten thousand books mostly on matras, philosophy, literature, vedas and vedanta. This library receives

twenty four journals.

Dharumapuram Adheenam, Mayiladuthurai: Sri Mahasannidhanam, the Pontiff of Dharumapuram adheenam is its administrative head. It is registered under the Societies Registration Act. It works for six hours on all the seven days and functions in its own building and own land. The library has two hundred palm leaf works and ten thousand books. It receives twenty five journals. Most of the collections are on religion, philosophy and puranas. The library is being used by scholars and students belonging to the college run by the Mutt.

8. MANUSCRIPT LIBRARIES UNDER STUDY MANAGED BY PRIVATE INSTITUTIONS

There are four manuscript libraries in two districts namely Chennai District with three libraries and Tirunelveli with one library are managed by Private Institutions. Table 6 reveals the state-of-the-art of manuscript libraries under study managed by Private Institutions with respect to their name, place of location, year of establishment, status, quantum of collection (print and other forms), staff strength, microfilming and digitisation initiatives.

Table 6: State-of-the-Art-of Manuscript Libraries Managed by Private Institutions

S. No.	Name of the Library, Location and Year of Establishment	Status	Quantum of Collection	Staff Strength	Microfilming and Digitisation Initiatives
1	Mahamahopaddyaya Dr.U.V.Swaminatha Iyer Library, Chennai, Chennai District 1943	Societies Registration Act	Palm Leaf = 2568 Paper = 741 Books = 29868 Journals = 80 Notes on Various Kinds = 26 Special Collections = 2 CDs = 113	Curator=1 Librarian=1 Language Expert = 1 Administrative Staff = 3	Microfilming and Digitisation
2	C.P.Ramaswamy Foundation, Chennai, Chennai District 1966	Societies Registration Act	Palm Leaf=15 Paper =15 Books = 20500 Journals = 17	Director=1 Assistant=2 Administrative staff = 2	-
3	Kuppuswami Sastri Research Institute, Chennai, Chennai District 1947	Societies Registration Act	Palm Leaf=1500 Paper=50 Books=45000 Journals =40 CDs=300 Back Volume =10000	Director = 1 Librarian =1 Assistant =2 Language Experts = 6 Administrative Staff = 3	-
4	P.S.Krishna Iyer Memorial Trust, Nainaragaram, Tirunelveli District 2006	Societies Registration Act	Palm Leaf= 2690 Paper =700 Books = 3000 Journals = 20	Director = 1	-

An overview of the libraries listed in Table 6 is as follows:

Mahamahopadhyaya Dr.U.V.Swaminatha Iyer Library, Besant Nagar, Chennai[12]: The library

was established in 1943. The library is registered under the Tamil Nadu Societies Registration Act. The Administrative head of the library is the curator. The library works from Monday to Saturday for 7 hours a day. The library has 3600 square feet with one floor and is functioning in donated land with its own building. The library is open to all without any fees. The library gets Tamil Nadu State Government reimbursable grant in aid for the salaries of staff and donations from both National and International donors. The library has bequeathed manuscripts from the family of Dr.U.V.Swaminatha Iyer. Manuscripts which are donated are also being accepted. The library has one Librarian, one Tamil Pandit, one Clerk and two Office Assistants to carry on its regular activities. Library has a publication division. The library has 2149 bundles of palm leaves manuscripts which have has 3709 works out of which only 1439 contains 2572 works have details. Four palm leaf works do not have complete details. 741 works are available in the form of paper manuscripts for which details are available. The library has books in Tamil, Sanskrit, Telugu, Malayalam, Kannada and English. The library caters to the needs of the users by its rich collection in works like literature, grammar, agarathi, religion, puranas and so on. The library has fourteen out of eighteen Tamil Sangam Literary works. The library has housed twenty six volumes of compilation of notes of various kinds penned by Dr.U.V.Swaminatha Iyer. The library has three thousand four hundred and twenty one letters written by eminent scholars addressed to Dr.U.V.Swaminatha Iyer. The library received eighty journals (Baskar and Ramessh Babu, 2013)[13].

C.P.Ramaswamy Foundation, Chennai[14]: It was established in the year 1966. In order to promote the study of Indian art, history, and culture and organise seminars and conference on various aspects of Indian Culture and History. The Institute has a reference library having over twenty thousand books and fifteen palm leaf and fifteen paper manuscripts on Indian Philosophy, religion, history, culture, art, law and environment. The library subscribes seventeen journals. The library works for eight hours on six days a week. The library is registered under the societies registration act with Director being its Administrative head.

Kuppuswamy Sastry Research Institute, Chennai[15]: The library was established in the year 1947. It is registered under the Tamil Nadu Societies Registration Act. The prestigious collection of the Institute includes many rare books that proclaim the wisdom of our ancient sages in all branches of learning. Some of them rich in content and elegant in print and which are very old deserve adequate care in preserving them for posterity. The uniqueness of the Institute's library is that it preserves the precious personal collections of great savants such as Dr.S.Radhakrishnan, Prof. Hiriyanna, Dr.V.Raghavan and others which are hardly available elsewhere. The Library has nearly forty five thousand books authored by great and popular writers on variety of Sanskrit and Indological subjects like Anthropology, Epigraphy, Ethics, Law, Language and Literature, Philosophy and Ayurveda. These books are in varied languages like Sanskrit, Tamil, Telugu, Kannada, Malayalam, English, German and French. The library has journals and back volumes. The library also has a large collection of noteworthy palm-leaf Manuscripts written in Grantha, Malayalam, Telugu, Tamil, Nandinagari scripts and Manipravala Style Script. These manuscripts contain material related to Vedas, Epics, Srauta, Dharmasutras, Philosophy, Literature and the like. The library has one thousand five hundred palm leaf manuscripts and fifty paper manuscripts. The library receives forty journals. The library has three hundred CD ROMs and ten thousand back volumes.

P.S.Krishna Iyer Memorial Trust, Nainaragaram[16]: The library was established in the year 2006 and is registered under the Societies Registration Act. It works for eight hours on all the days. It is open to all and free. It is functioning in its own land with its own building and is self financing. The area of the library is two thousand and four hundred square feet with one floor. All the manuscripts are being received as donation. 2690 works of palm leafs are there in Tamil, Sanskrit, Telugu and Malayalam languages. The efforts of this Trust especially in preserving the palm leafs should definitely be applauded. This library has three thousand books to its credit and it receives twenty journals. All the books and manuscripts are well maintained and a list of all its collections are made available to the users.

9. CONCLUSION

"Presvention is better than cure" is a common proverb in conservation. The cultural properties like manuscripts, inscriptions, paintings, stucco works sculptures, bronzes, temples, palaces, toms and other architectural sites have to be maintained with constant care and under keen observation. These libraries are taking their best efforts to protect most invaluable possession of manuscripts through microfilming and digitization. The authorities concerned with provision of funds for management and development of these libraries of different categories are requested to make earmarked allocation in the respective budgets for developing up-to-date conservation units wherever feasible and/or for adoption of suitable programmes for conservation and preservation work for preservation of all documents considered worthy of preservation (Baskar and Ramesh Babu, 2011)[17].

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STRATEGY AND ASSESSMENT OF ELECTRONIC RESOURCE MANAGEMENT IN LIBRARIES : A STUDY

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1. INTRODUCTION

With the extensive exploitation of the opportunities offered by information technologies, in order to survive, libraries have experienced a strong move towards becoming more or less completely digitized. This fact, of course, has influenced how the physical, as well as the digital library, is designed and presented to its potential customers. It has been observed, during the last few years an innovative approach based on acknowledging the importance of knowledge sharing and knowledge exploitation has led to many organizations revisiting their library resources and expertise and as a result re-establishing attractive library facilities. This lead to the creation of Electronic Resources in Libraries and their focus shifted from collection to connection. For years libraries have been placed under strong pressure to become more cost-effective, to deliver results that count for the parent organization, whether an academic institution, a public authority or a commercial enterprise. Libraries have undoubtedly succeeded in this turnaround and have brought to the table significant arguments for their future existence. New roles have been defined, verifying that the library is a main vehicle for cost-effective information provision and flow within organizations, for knowledge accumulation, sharing and use and, last but not least, for enhanced learning capabilities. Libraries have become integrated into the information and knowledge value chain of their parent organizations

2. WHAT IS ELECTRONIC RESOURCES AND ELECTRONIC RESOURCE MANAGEMENT?

Electronic resources" refer to those materials that require computer access, whether through a personal computer, mainframe, or handheld mobile device. They may either be accessed remotely via the Internet or locally. Some of the most frequently encountered types are: E-Journals, E-Books, Full-text (aggregated databases), Indexing and abstracting databases, Reference databases (biographies, dictionaries, directories, encyclopedias, etc.), Numeric and statistical databases, E-images, E-audio/visual resources, etc.

Whereas, Electronic Resources Management (ERM) means management of electronic resources. According to the Digital Library Federation (DLF), an electronic resource management system should facilitate "management of the information and workflows necessary to efficiently select, evaluate, acquire, maintain, and provide access to electronic resources" (Jewell et al. 2004). An efficient electronic resources management system should be a "one-stop shopping" place for all of the disparate pieces of information related to electronic resource subscriptions. Furthermore, an ERM system should streamline workflows and the dissemination of information, thereby eliminating the necessity of reentering data that already exists in separate systems.

3. ADVANTAGES OF E-RESOURCES

E-Resources have a number of advantages over traditional print based sources and various advantages

of e-resources are as follows:

- **Easy Access:** Since it is easy to access, users feel comfortable and easier in accessing the e-resources. Large collections of materials can be searched and retrieved simultaneously and instantly. It can be accessed the desired material within minutes or seconds if it is well equipped and stored. E-resources also allow intelligent full-text retrieval based on past use and interests. Electronic resources are often faster than consulting print indexes, especially when searching retrospectively, and they are straighter forward when wishing to use combinations of keywords. They open up the possibility of searching multiple files at one time, a feat accomplished more easily than using printed equivalents. One main advantage, especially to distance learners or those with limited time to access the library is their availability from outside the library through online methods.

- **Speed:** An electronic resource is lot quicker to browse or search, to extract information from, and to integrate that information into other material and to cross-search or reference between different publications. Since E-resources are available electronically, it provides high speed and efficiency in publication, distribution and access. Authors and Publishers can be integrated easily by computers thus help in quick publication, review process and also saves valuable time.

- **Just in time:** The information needed can be delivered from the most appropriate source to the user; the user can re-specify his or her needs dynamically; the information is obtained when it is wanted, so becomes "just in time" rather than "just in case"; the user selects only the information needed to answer the specific question.

- **Functionality:** E-resource will allow the user to approach the publications to analyze its content in new ways by click of the mouse on search mode.

- **Content*:*** The e- resources can contain a vast amount of information, but more importantly the material can consist of mixed media i.e. images, video, audio animation which could not be replaced.

Apart from the above some other advantages of e-resources may include: international reach, unlimited capabilities, reduced cost, convenience, search ability and linking.

4. DISADVANTAGES OF E-RESOURCES

Apart from having many benefits or advantages of e-resources, it has also many disadvantages. Various disadvantages of E-resources are as follows:

- Financial Constraints: The infrastructure required for providing e-resources services are expensive. Further, downloading, printing, storing etc. is a costly affair. Therefore, implementing e-resources service and maintaining the same requires higher cost.

- Technological constraints: To get the e-resources one needs to be Tech-savvy. Technological knowledge is necessary for both the library staffs and the users who would be using the same. Without minimum technological knowledge it does not have any use.

- Social Constraints: Electronic interfaces can take a long time to master. Further, the simple or habitual practice of traditional activities /tasks might frustrate the users. It is observed that people read up to25 to 30 percent more slowly on a computer screen than on paper.

Apart from the above disadvantages, the other discomfort face by the users is as follows:

- Difficulty reading computer screens:
- Limitations of computer monitor
- Read information in the screen
- Often not included in indexing and abstracting services
- Search engines ignores PDF files

5. THE LIFE CYCLE OF E-RESOURCE
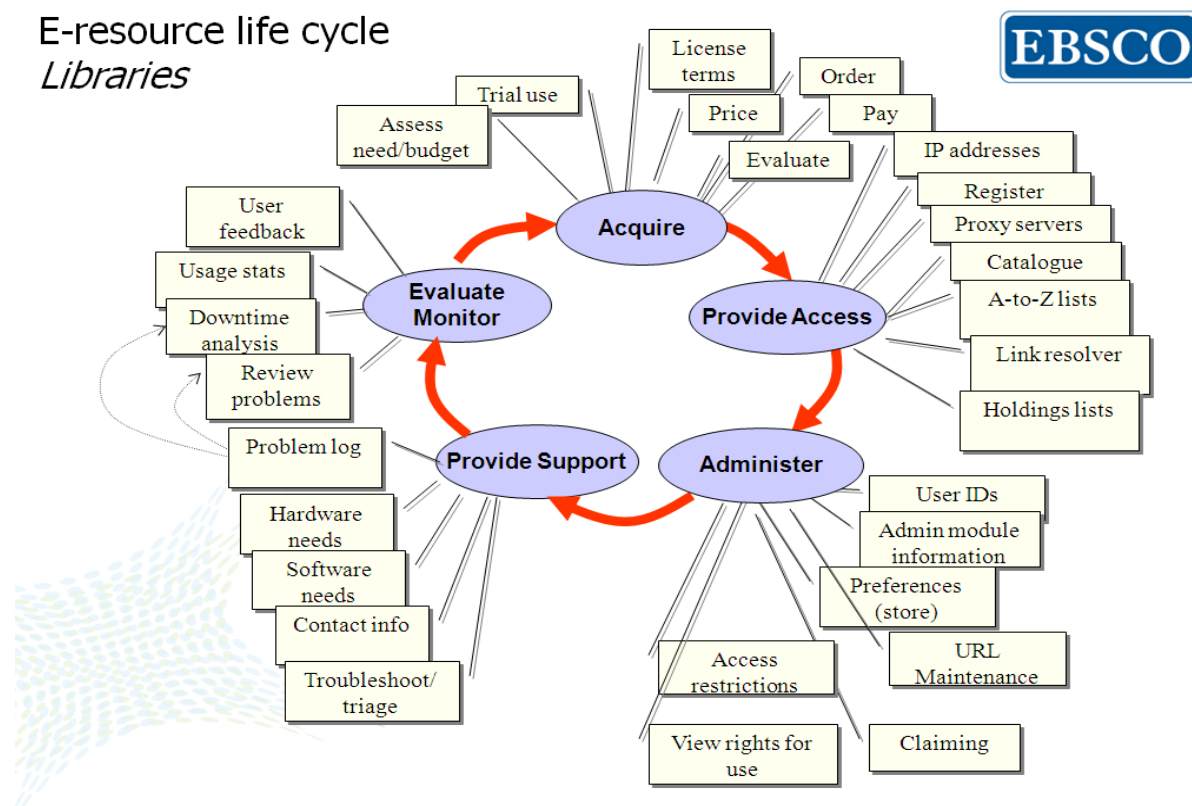
Before implementing ERM in Libraries, librarian should know the basic or life cycle of e-resources properly. E-resources are as complicated and challenging as those of human beings. They are born, and at times they also die or are reincarnated under a different name or in different shape. E-Resource life cycle consists of Acquisition of E-resources, Provide Access, Administer, provide support and finally to evaluate/monitor. The above picture shows the various parts and sub-parts of the life cycle of e-resources. When one has the basic knowledge on these activities, it is easier on his/her part to implement ERM system in libraries.

6. STRATEGY FOR E-RESOURCE MANAGEMENT IN LIBRARIES

The strategy for ERM in libraries is as follows:

- **Planning:** Planning for electronic resources is perhaps the most important and least practiced activity in libraries. Electronic resources present a number of challenges to the traditional library operations and workflow that must be addressed in order to provide smooth management. The challenges faced by many libraries include operational issues such as the number of staff assigned to electronic resource management duties, staying in-step with technological and vendor changes in electronic resources, budgeting limited resources for the acquisition of resources, and communication with vendors and amongst librarians and administrators. Other challenges relate to access issues such as management tools like open URL knowledge bases, federated searching, catalog records, and authentication.

- **Policies:** The development and use of policies is critical in electronic resource management and for communicating a library's goals. Policies set guidelines of practice that aid in electronic resource management. Aside from collection development policies, libraries need policies that address issues such as types of resources to support, licensing issues, and user access. Other policy topics include how and which resources should be cataloged, placed in a content

management system or subject guide, or added to an ERMS.
- **Workflow:** Related to planning and policy development, workflow and the documentation of the workflow is a crucial aspect of electronic resources management.

It conducts a systematic analysis of electronic resources workflow of all the library staffs that are entrusted with specific job for ERM. The workflow analysis will provide the groundwork for developing a more efficient and effective workflow. A redefined workflow may lead to changes in what to do, how to do it, and who does it. The ultimate hope is that it will create space for pursuing new projects and allow us to take a more deliberate, less reactive, approach to electronic resources management.

Effective documentation system: The strategy also includes an effective documentation system. Therefore, a creation of effective documentation system is necessary for electronic resource management. It will identify, create and maintain current documentation for electronic resource management, including policies, procedures, and workflows. The documentation should be accessible to library faculty and staff and to patrons, when appropriate. This initiative will reduce duplicate, outdated, and hidden documentation, and make our electronic resources management program more transparent and efficient

Develop An Effective Electronic Resource Management System (ERMS): An ERMS is needed to assist in managing the details of our subscriptions, from licensing terms to usage statistics. It will explore a range of ERMS options, from commercial products, to open source software, to locally developed databases and spreadsheets. Developing an effective ERMS not only involves identifying tools with which to manage the subscriptions, but implementing an effectual system for communicating information about those subscriptions to library faculty and staff and, in some cases, teaching them to use the ERMS themselves. Therefore, an effective ERMS is must.

Process to Provide Advance Seamless Access to Electronic Resources: Once the effective ERMS is functional or implemented, the next strategy would be how to provide advance seamless access of electronic resources to users. In order to do the same, one should explore the ways to provide the users with more seamless access to electronic content through a variety of tools, from database interfaces, to the online catalog, to link resolvers, to federated (one-stop) search tools, to the library's web site, to the course management system. It is not only to advance access to learning resources for users, but also to promote better integration of the internal systems.

Collaborative Research and Exploration: This strategy includes how collaborative research and exploration enable a well functioning of ERM. Periodically or at regular interval research must be undertaken to know the proper use and functioning of ERM. The success of ERM depends on collaborative effort of all staff members and feedback from the users and corrective measures taken by the organization/library to implement the same.

Assessment of ERM: Once the ERM system is implemented, the result or functioning of ERM system will be measured or assessed through assessment. Assessment will track the progress of electronic resources and its management. It will give an idea where the ERM system is moving, where it is lagging and where to focus for improvements. The assessment will be done on following ways:
- *Library Focus Group:* The library should regularly track a small group of users and interviews them to assess their attitudes, experiences and beliefs about the library and their needs. It may gather data from the focus group through discussion that pertains to access and use of electronic resources.
- *Website study:* The library should conduct periodic evaluations of the effectiveness of the library's website. The evaluations may include student surveys, focus groups, usability testing, and /or analysis of website usage statistics. Further, assessment may be done after gathering data from these studies that pertain to access and use of electronic resources.
- *Electronic resource usage statistics:* It will gather usage statistics annually and use them to

identify what is working well and what needs to be improved in terms of accessibility, content, organization, promotion, and usability of electronic resources.

- *Library Faculty and staff survey:* Assessment will also be done through library faculty and staff survey. By collecting the feedback from library faculty and staff on the inputs on how well electronic resources management programme is supporting their work and survey may be done regarding accessibility, usability, and content of electronic resources based on their interactions with the users in reference and instruction sessions and their collection development work with faculty can be measured/judged and improvement can be made.
- *Workflow Analysis:* Workflow analysis will also add to assessment. One can conduct a workflow analysis by reevaluating existing workflow practices or selecting a special project for which to analyze workflow. This help in identifying areas for improvement in overall workflow and to be intentional, efficient and proactive with electronic resources management.
- *Research and Exploration Report:* Another way of assessment of ERM is through research. One may prepare a report on recent research and exploration in electronic resources management trends. This reporting mechanism will hold accountable for exploring better, creative and new ways of meeting the goals of library for effective electronic resources management.

7. CONCLUSION

No doubt strategy plays a vital role in implementing ERM system in libraries. Therefore, it is advisable; libraries must regularly work towards creating policies, documenting their workflow, and planning in all areas of electronic resource management. This ultimately reflected on the objectives and goal of library. Further, time to time ERM must be assessed to know whether it is functioning properly or not. From the assessment, one can come to know the changing needs of users of library and uses of e-resources. Regular assessment leads to perfect, result oriented ERM system in place for the library. As a whole, it may be concluded that strategy and assessment are two must essential factors which decide the ERM's success story in libraries.

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LIBRARY CONSORTIA IN INDIA : AN OVERVIEW

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1. INTRODUCTION

Today libraries are facing various challenges to meet the increasing demands for various services like the rise in the information resources, high cost of library materials, high expectations from users and the cuts of budget etc. In order to meet these challenges library consortia are created to help the libraries to get better prices by buying joint access for a greater number of users, expanding access to print and electronic collections and developing new services to meet their customers' needs. This paper attempts to address a view of library consortia, the advantages & disadvantages of consortia for libraries and the consortia activities in India.

"Library consortia" refers to the co-operation, co-ordination and collaboration between and among libraries for the purpose of sharing information resources. A review of the literature shows that "library consortia" is not a new concept. Early examples, from the late 1960s include the development of the Ohio College Libraries Center (OCLC) as a regional computer system for 54 Ohio college libraries to share their resources and to reduce costs, and the Birmingham Libraries Co-operative Mechanisation Project (BLCMP) in the UK. However consortia were not really common until the 1980s. The main driving forces for collaboration among libraries, especially academic libraries, has been the increase in numbers of publications and the rise in the cost of publications as well as the decline in library budgets. The increase in student enrolment in higher education and increasing demands for library services and collections were other factors given, from the 1980s onwards, for collaborative efforts by *Nfila and Darko-Ampem (2002)*.

A consortium is said to be a co-operative arrangement among groups or institutions or an association or society. Consortia are commonly formed to increase the purchasing capacity of the collaborating institutions, to expand the resource availability and to offer automated services. In other words, it is described as a group of organizations whose purpose is to collectively facilitate and support the work of a service program in ways that add material and human resources beyond those available to each organization/individual (*Rajgoli, Birdie & Karisiddappa, 2005*).

The consortia can be formed at a local, regional, national or international level, on functional or on subject basis. Majority of the libraries particularly in developing countries like India are thinking about the co-operative purchasing of resources for any group(s) of libraries. The consortia are established on a formal structure regarding resource sharing with formal agreement by each participating library.

2. NEED OF LIBRARY CONSORTIA

Historically, the common form of library co-operation was the sharing of union catalogue information, storage facilities, collection development and human resources at local, national and regional levels in the US (*Payne, 1998*). Later, other countries also ventured into co-operative efforts. In the period between 1980 and 1990 many libraries in Western countries were involved with library automation, coupled with the increased use of computers in bibliographic processing activities and database searching. There was a need to share expertise on library automation and this was considered as a possible reason to move toward library consortia in the 1980s by *Nfila and Darko-Ampem (2002)*.

However, day by day the need for library consortia is increasing due to the following reasons;

3. LITERATURE EXPLOSION

The growth of literature is expanding exponentially. It is estimated that new information grows about 30% per annum (*Lyman & Varian, 2003*). The growth of literature is so voluminous that it is impossible for any library to attain self-sufficiency. The voluminous publication of books, periodicals and other publications have made it beyond the control of any library to procure all the publications produced.

Financial Crisis: Financial crisis in almost all the institutes leads to the libraries to opt for consortia development activities. It is difficult in the part of the libraries to continue the subscription, even for the core journals due to the ever increasing cost of journal subscription. This is more acute in the case of international journals. According to *Cholin, Satyabati & Muthry, (2006)* the Indian universities are subscribing less than 300 titles of journals where as the average number of journals subscribed by the western countries is much higher.

User Demand: The need of information and literature differs from user to user. It also varies according the categories of users also. The need of literature is more in case of researchers than the simple students. Further the researchers need the latest information & literature which can be met through the consortia only since no library can provide all the information.

4. COMPUTERISATION OF LIBRARY SERVICE

The computerization and automation of library service has played an important role on consortia. Due to computerization, the libraries could share their resources easily and access to information became easy. As a result the role of librarian has been changed from `gatekeeper of information' to manage *'gateways to information* ' which has enhanced the value of library consortia.

5. THE ADVANTAGES AND DISADVANTAGES OF LIBRARY CONSORTIA

Advantages: The advantages for libraries if they buy their resources through consortia can include:
- easy shared access to vast information resources;
- all the participating libraries could access all the resources;
- smaller libraries can get more benefit in terms of finance and information;
- possible global impact;
- common interface to resources;
- superior quality of resources and service;
- gaining competitive advantage by pooling resources, mutual interest and complementary skills;
- enable libraries to procure more resources with less finance; and
- ability to achieve goals easily.

Consortia can bring economy, efficiency and equality in information availability and use. Participant institutions in a consortium have access not only to their own resources but sources in the other institutions as well. This can allow the gap between information resource rich libraries and those, which are resource deficient to be bridged *(Pandian et al., 2002*).

Libraries can acquire more resources by paying less if they are members of consortia. Consortia purchasing offers, more resources than might otherwise be possible in single purchase. For the consortia members it offers reduced costs in the inter-institutional document delivery processes for specific resources.

Resource sharing is considered to be a great advantage of consortia for libraries, as today, the ability for users to access resources is often more important than collection building within a particular

library. Through a library consortium, the collective strength of resources of various institutions available to it can be increased. The consortia enable libraries to gain the benefits of wider access to electronic resources at an affordable cost (*Singh and Singh, 2004*).

Disadvantages: Inspite of the above mentioned advantages Helmer (2004), of the Orbis Cascade Alliance in the Northwest of the US, has listed the following disadvantages of consortia:
- duplication of effort;
- reduced buying power;
- confusion for libraries, vendors, and patrons;
- diffusion of financial resources; and
- diffusion of human resources.

6. SOME LIBRARY CONSORTIA IN DIFFERENT COUNTRIES

Ghosh (2002) reported on library consortia at an international level and included reference to the following:

ThaiLIS – a national resource-sharing system in Thailand formed from THAILINET, a network of online catalogues of academic libraries in the Bangkok region, and PULINET, a grouping of provincial academic libraries (http://uc.thailis.or.th/).

China Academic Library and Information System (CALIS) – this was launched in 2000 and is a nationwide academic library consortium which links services across the provinces and cities in China (www.calis.edu.cn/calisnew/).

**Consortium of Academic Libraries of Catalonia (CBUC*) –* a consortium of the state-funded universities and the State Library of Catalonia in Spain (www.cbuc.es/).

Gauteng and Environs Library Consortium (GAELIC) – the largest academic library consortium in South Africa, which is striving to achieve greater efficiency in the area of document delivery, with the objective of providing information rapidly, cost-effectively, and in accordance with users' needs and expectations (www.gaelic.ac.za/).

Regional University and Science Library Advanced Network (RUSLANet) – in the Northwest of Russia, which is creating a common information space of libraries and integrating with the worldwide library information space (http://consortium.ruslan.ru/).

South African academic libraries have been involved in consortia activities since the 1990s and examples include:
- Cape Library Cooperative (CALICO), established in 1992.
- Gauteng and Environs Library Consortium (GAELIC), established in 1996.
- Free State Library and Information Consortium (FRELICO), established in 1996/1997.
- Eastern Seaboard Association of Libraries (eSAL), established in 1997.
- South East Academic Library System (SEALS), established in 1998.

7. LIBRARY CONSORTIA IN INDIA

In India more than 500 universities and institutes of national importance and about 20,000 colleges provide higher education in different disciplines. Due to the large volume of users i.e. teachers and students the academic libraries in India are facing problems like, increasing demands and high expectations from users, budget cuts, high costs of library materials especially electronic journals, and a rise in the amount of information resources in general. As a result it is impossible in the part of a single library to provide access to all materials to meet their users' needs. In order to meet the users' demand the library consortia have been initiated in India and still efforts are continuing to form new consortia though many consortia are still in their infancy.

At present, there are some networks working at national level like: INDEST, CSIR consortium, UGC-INFONET Digital Library Consortium, ICMR, CeRA and ISRO etc. Besides these some metropolitan networks are functioning to share information among themselves like ADINET in Ahmedabad, CALIBNET in Kolkata, PUNENET in Pune, HELNET for Health libraries, MANLIBNET for management libraries and DELNET for Developing libraries etc.

INDEST: The Ministry of Human Resource Development (MHRD) has set up the Indian National Digital Library in Engineering Science and Technology (INDEST) consortium. The HRD Ministry provides funds required for providing differential access to electronic resources subscribed for the consortium to the core members through the consortia headquarters set-up at the Indian Institute of Technology (IIT) Delhi. Now the consortium has more than 1000 members with more than 30 electronic resources from different publishers and aggregators. (*http ://pani it. i itd.ac.in/indest*)

CSIR: The National Knowledge Resource Consortium (NKRC), established in year 2009, is a network of libraries and information centres of 39 CSIR and 24 DST institutes. NKRC's origin goes back to the year 2001, when the CSIR set up the Electronic Journals Consortium to provide access to 1200 odd journals of Elsevier Science to all its users. Over a period of time, the Consortium not only grew in terms of the number of resources but also in terms of the number of users as more like-minded institutes evinced interest to join the Consortium.

Today, NKRC facilitates access to 5,000+ e-journals of all major publishers, patents, standards, citation and bibliographic databases. Apart from licensed resources, NKRC is also a single point entity that provides its users with access to a multitude of open access resources. The Consortium envisions emerging as a leader to serve the R&D sector with much needed information to strengthen the research and development system in the country. (***http://nkrc.niscair.res.in/AccessDetails.php***). After the formation of NKRC the FORSA consortia became closed and all the institutions of Department of Science & Technology have come under one umbrella. (*http://nkrc.niscair.res.in/indexpage.php*)

UGC Infonet Digital Library Consortium (*http://www.inflibnet.ac.in/infonet/*): The UGC-Infonet Digital Library Consortium was formally launched in December, 2003 by Honourable Dr. A P J Abdul Kalam, the President of India soon after providing the Internet connectivity to the universities in the year 2003 under the UGC-Infonet programme. The Consortium proved to be a recipe to university libraries which have been discontinuing subscription of scholarly journals because of "Serials Crisis". The term "serials crisis" refers to exponential and continuing increase in subscription cost of scholarly journals. The crisis is a result of rise in cost of journals much faster than the rate of inflation, increase in number of journals and the paucity of funds available to the libraries

The Consortium provides current as well as archival access to more than 7500+ core and peer-reviewed journals and 10 bibliographic databases from 26 publishers and aggregators in different disciplines. The programme has been implemented in phased manner. In the first phase that began in 2004, access to e-resources was provided to 50 universities who had Internet connectivity under the UGC-Infonet Connectivity programme of the UGC. In the second phase, 50 more universities were added to the programme in the year 2005. So far 209 Universities including 14 National Law schools and central universities that come under the purview of UGC have been provided differential access to subscribed e-resources. These e-resources covers almost all subject disciplines including arts, humanities, social sciences, physical sciences, chemical Sciences, life sciences, computer sciences, mathematics and statistics, etc. The programme is wholly funded by the UGC and executed by the INFLIBNET (Information and Library Network) Centre, Gandhinagar.

The benefit of subscription to e-resources would also be extended to the colleges, to begin with the College for Potential with Excellence (CPE) and autonomous colleges. The Consortium has also launched its "Associate Membership Programme" wherein private universities and other research organizations are welcomed to join the Consortium for selected e-resources.

(http://www.inflibnet.ac.in/econ/about.php)

UGC-DAE Consortium for Scientific Research: The UGC-DAE Consortium for Scientific Research is created to promote interaction amongst the scientists working in the research centres of the Department of Atomic Energy and the faculty from the universities and other institutions of higher learning, and to enable young students to work on programmes of national importance under the joint guidance of the faculty from universities and the scientists of DAE so as to nurture an organic linkage between the university system and research centres of DAE, the University Grants Commission and Atomic Energy of new research facilities. Accordingly, the University Grants Commission created an Inter-University Consortium, with its headquarters at Indore for the utilization of the facilities established by the Department of Atomic Energy. The Inter- University consortium has over the years taken several initiatives to foster the interaction between the University system and the DAE institutions. (*http://www.csr.res.in/overview.html*)

ICMR E-Consortia: As part of providing the e-resources to its scientists and other users the Indian Council of Medical research has identified the four core bio-medical journals and subscribes for e-version in consortia mode to all ICMR institutes. These include Lancet, Science, NEJM, and Nature. These e-journal consortia will be beneficial for cross sharing of information among the ICMR Institutes. (***http://icmr.nic.in/icmrnews/e_consortia.htm***)

CeRA: India is predominantly an agrarian country, and the growth of agriculture is reflected in the good yields of different crops that depend on various factors – natural and man - made. Agricultural research, the backbone of agricultural growth in the country, demands timely dissemination of knowledge being generated and updated across the globe from time to time. Since ICAR is having network connectivity across institutes and state agricultural universities, select journals could be made available over the network for the use of scientific community. Accordingly, the Consortium for e-Resources in Agriculture (CeRA) was established in November 2007 for facilitating accessibility of scientific journals to all researchers / teachers in the National Agricultural Research System by providing access to information specially access to journals online which is crucial for having excellence in research and teaching.

The objectives of CeRA is to upscale the existing R & D information resource base of ICAR Institutions/Universities comparable to world's leading institutions / organizations and to subscribe e-journals and create e-access culture among scientists / teachers in ICAR Institutes / Agricultural Universities. A web - based application was developed for facilitating the online access. The URL is (**www.cera.jccc.in**). All Consortium members are provided the access through respective IP address(es). (*www. **http://cera.iari.res.in/***)

ISRO: The resource sharing initiative taken by Indian Space Research organization (ISRO) libraries by avoiding duplicate subscription to bibliographic databases is expected to result in savings of Rs. 41 Lacs per year. Further, the proposed cancellation of duplicate journal titles by its centers is likely to save the surplus amount that could be used to provide access to e-journals for the benefit of all the centers. A move is there to form formal consortium for providing access to e-journals and also J-Gate to custom contents for the consortia. (Sridhar, 2002)

8. ISSUES OF LIBRARY CONSORTIA

The consortium activity is a complex process. It requires the wholehearted support and concerted efforts of the librarians, their management and the publishers. They form an important trio in the scholarly information environment. A large number of issues related to consortia include identifying the resources, uninterrupted online access, perpetual access to back issues, pricing, licensing, subscription payment, copyright and archival solutions etc. are involved.

Resources Identification: The Identification of the most suitable product for all the members of the consortium is more or less a difficult task. This is mostly because each and every member will have

their own choice list of information products and services, though the overlap between the products will be on the higher side in the case of an ideal homogeneous group.

Technology Infrastructure: Long range planning and identification of the appropriate IT and Communication infrastructure conducive for proper delivery of information resources is the pre-requisite for every participating library.

Pricing: Regarding the pricing of e-resources there is no standard practices or processes to be followed by majority of the publishers of scholarly literature and hence this is a gray area all together. In most cases cost of the journals are out of reach of many of our libraries and only a consortia approach could provide some meaningful practical solution. The publishers are invited for negotiations and asked to offer their best prices to the consortia. Several methods of pricing are followed, but what is important is that finally the price offered by the publisher should be economically viable for the participating libraries. And it should also ensure uninterrupted and perpetual access to the resources.

Access: Various access methods are offered by publishers towards accessing their resources and it varies from case to case. Access authentication could be User ID / Password based or IP based which are more popular. Uninterrupted and hassle free access to the scholarly content is the ultimate objective of the consortium but varying practices may make access sometimes cumbersome to use consortia approach .

Licensing and Copyright : Against the print paradigm, the e-Journal subscriptions and access models allow only licensing of the content / product for a stipulated period of time which has several restrictions and bindings on the licensee. A number of issues are being debated by librarians, users and publishers which need international attention, deliberations and solution.

Archiving: Archiving needs paramount attention and unfortunately this is yet to be attended in India. Long term preservation of the invaluable wealth of information being accumulated by the consortium is to be archived and preserved for posterity. As the technology is fast progressing and also getting obsolete almost at high pace, it is right time that information resources are carefully archived and preserved on a long term basis through consortia approach and efforts.

Sustainability: Designing and launching a library consortium is perhaps the easier part when compared to its long term sustenance and longevity. The management and the members of the consortium have to strive hard in formulating and establishing robust models towards achieving the above goals.

Usage and Usability: The Return on Investment (ROI) of the consortium is measured in terms of the increased usage, usability of the costly information products which is ultimately reflected in the scientific productivity of the host institutes. It is the earnest efforts of the consortium, the management, the researchers and faculty and the librarians which determine the success or otherwise of any consortium. (Shree Kumar & Sunitha, 2007)

Training: Training to the users is another issue that one has to give proper consideration. Usually the users are habituated to handle the traditional resources of information. They are reluctant to sudden change in the handling of information. So, it is the library that has to train the users to face the new media, highlight the benefits through orientation and training programmes.

9. CONCLUSION

Library consortia are really helping the researchers, faculties and the students to retrieve the information and save their time. It benefits the libraries to procure more electronic resources in the library with limited library budget and this is what the libraries require in the present scenario. India should also take initiatives to establish national archival centers like United States. The mission of the

national archival centre could be to build archival collection of important scholarly journal literature and to fill the gap in the library collections of journal back volumes and also help to reduce long term capital costs associated with storage.

With the help of networks and the internet, libraries in India have also begun to create consortia at national and regional level to share their resources and expand access to print and electronic collections and develop new services to meet their customers' needs. However, some barriers such as poor technological and communication infrastructure, inadequate finances, culture and context, attitude toward consortia and multiple efforts are reported to be limitations of consortia activities in India.

It can be concluded from the discussion that libraries in India need to battle with the problems that prevent a successful consortia effort, because the advantages of consortia, especially for sharing electronic resources, are much more for these libraries. Membership of international consortia can be recommended for leading institutional libraries, as it brings them all together to redefine and re-engineer their consortia efforts.

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Section V
INFORMATION NEED
AND
USER EDUCATION

AWARENESS AND USE OF SOCIAL NETWORKING TOOLS AMONG THE PH.D. RESEARCH SCHOLARS OF BUNDELKHAND UNIVERSITY, JHANSI

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1. INTRODUCTION

In the present time through the development of Information Communication Technology everything is being changed. Information Communication Technology changed communication techniques, means of accessing of information and information searching etc. we can see impact of information communication technology each aspect i.e. Communication, Information sharing, Information management etc. Social networking is an outcome of development in ICT. In modern time everybody is being known by the social networking. People are using social networking for being in touch, and to create a social relationship.

2. SOCIAL NETWORKING

Social networking is very popular in present time Social networking is a social platform where we can share our opinion, ideas, interests, activities, file sharing, feelings, etc .and it provides the facilities to people to interact with people, sharing, browsing, searching, invite friends and publicity etc. Many Organizations, industries, companies, libraries, university, college etc are using social networking tools to promote their services for marketing. Social networking is very useful to access information, to use leisure time, for social relationship, for discussion, to share ideas or opinions, thoughts, to communicate with friends and to share experience etc.

A social networking service is web-based technology that provides the facilities to create a virtual social network for people where everybody can share interests and activities or who are interested in exploring the interests and activities of other. Most social network services are web-based interfaces that facilitate community of users to interact with each other deploying tools such as chat, messaging, email, video, voice chat, file sharing, tagging, discussion groups, etc.

3. SOCIAL NETWORKING TOOLS

- Facebook
- Myspace
- Twitter
- LinkedIn
- Blogs
- Flicker
- YouTube
- Wiki
- Orkut etc.

4. BENEFITS OF SOCIAL NETWORKING SITES
- Education
- Marketing
- Publicity
- Being up to date
- Social relationship
- Share ideas, thoughts, experience and feelings etc.
- Information sharing
- Instant messaging etc.

5. OBJECTIVES OF THE STUDY
The objectives of the present study have been following:
- To find out the level of awareness among Ph.D. research scholars about the use of internet.
- To find out the role of social networking tools in creating awareness among Ph.D. research scholars of Bundelkhand University Jhansi.
- To know Ph.D. research scholars view about uses and services of social networking.

6. SCOPE
In this present study the researcher has attempted to find out awareness and use of the social networking tools among the Ph. D. research scholars of Bundelkhand University, Jhansi. Scope of the study is confined only to Bundelkhand University, Jhansi.

7. METHODOLOGY
In this study data was collected through questionnaire method. Questionnaires were distributed among those Ph.D. research scholars of Bundelkhand University Jhansi who were using social networking sites. The researcher distributed 100 questionnaires but only 72 filled questionnaires could be collected back.

Table 1: Demographic Profile of Respondents

S. No.	Gender	Number	Percentage%
1	Male	45	62.5
2	Female	27	37.5
Total		72	100

It is clear from the table that 62.5% male respondents were using internet and 37.5% female respondents were using internet.

Table 2: Use of Internet

S. No.	Use of Internet	No. of Respondents	Percentage %
1	Everyday	51	70.83
2	More than once in a week	12	16.67
3	Once in a week	8	11.11
4	More than once in a month	1	1.39
5	Once in a month	Nil	Nil
	Total	72	100

As is evident from the table that most of the respondents i.e. 70.83% were using internet daily,16.67% using more than once in a week,11.11% using once in a week and minimum number of respondents (1.39%) were using more than once in a month.

Table 3: No. of Hours devoted on Internet Daily

No. of Hours	No. of Respondents	%
<1 hour	14	19.45
1-2 hour	34	47.22
3-4 hour	18	25
>5 hour	6	8.33
Total	72	100

As is clear from the table that out of total 47.22% respondents are spending 1-2 hours to use internet daily and only 8.33% respondents use internet more than 5 hours.

Table 4: Like Doing the Most on Online

Like doing the most on online	No. of Respondents	Percentage%
Web Browsing	56	77.78
Chatting	39	54.17
Blogs	32	44.44
Music	22	30.56
News	42	58.33
Gaming	15	20.83
File sharing	33	45.83
Social networking	45	62.5

Table 4 shows the most of the internet users uses the internet for web browsing 77.78% , out of the total 62.5% respondents use for social networking, 58.33% for news , 54.17 for chatting, 45.83 for file sharing and 44.44 for blogs and the least i.e. 20.83% users use it for gaming.

Table 5: Use of Social Networking Sites

S. No.	Use of Social Networking Sites	No. of Respondents	Percentage %
1	Regularly logged on	34	47.22
2	Several times a day	6	8.33
3	Once in a day	18	25
4	Once in few days	3	4.16
5	Once in a week	5	6.94
6	Occasionally	6	8.33

Table 5 shows the use of social networking sites. As is clear from the table that out of the total 47.22% respondents regularly logged on social networking sites and only 4.16% respondents use once in few days.

Table 6: Most Popular Social Networking Site

Social Networking Site	No. of Respondents	Percentage %
Facebook	68	94.44
Twitter	46	63.89
Orkut	28	38.89
MySpace	19	26.39
Hi5	Nil	Nil
Friendster	11	15.28
Blogger.com	32	44.44
Flikr	12	16.67
Bebo	Nil	Nil
Multiply	Nil	Nil

Windows live	8	11.11
Google buzz	3	4.17

Table 6 shows that most of the respondents use the Facebook then followed by twitter, blogger and orkut. Rest of the social networking sites are used on a very small percentage .while Hi5, Bebo and Multiply sites are not used by any of the respondents of this study. Thus Facebook is being used most for the purpose of Communication by the respondents.

Table 7: Reasons for Spending Time on Social Network

Reasons For Spending Time On Social Network	No. of Respondents	%
Find some information	20	27.78
Get opinions	10	13.89
Entertain yourself	24	33.33
Socialize	32	44.44
Stay up-to-date with friend's life	36	50
Share your experience	24	33.33
Communicate with family and friends	60	83.33
More convenient than Phone/ Email	16	22.22
Share Videos/ Pictures	20	27.78
Make new friends	28	38.89
Relationship	24	33.33
Keep up-to-date with social events	12	16.67
Friends use the site	4	5.56
Easy to register	8	11.11
Ease of access to friends & family	60	83.33
Can edit privacy settings	18	25
Do the business	4	5.56
Other	0	0

Table 7 tell us that most of the people use social networks for communication with family and friends (83.33%) and it is a convenient method through which we can interact with the family and friends (83.33%) followed by stay update friend's life.

Table 8: Participation in the Professionals' Community Discussions

Participation in the Professional Communities Discussions	No. of Respondents	%
community moderato/group officer	5	6.94
active participant in terms of comments and discussion topics starting	8	11.11
rather a reader than an active commenter	35	48.61
Do not participate in discussions, just watch communities for updates	42	58.33

Table 8 shows that out of the total 58.33% respondents do not participate in discussions just watch communities for updates and they are followed by active commenter i.e.48.61%.

Table 9: How Often Check Communication Communities for Updates

How Often Check Communication Communities For Updates	No. of Respondents	%
Daily	12	16.67
Several times a week	16	22.22
Once a week	33	45.83
Less than once a week	11	15.28
Total	72	100

Table 9 shows that Ph.D. research scholars check communities for updates mostly once in a week (45.83%).

Table 10: Trust on the Information Obtained Via Social Networking Websites

Trust On The Information Obtain Via Social Networking Websites	No. of Respondents	%
Yes if it comes from my friends/connections	14	19.44
Yes if comes from professional communities	15	20.83
Yes if it comes from company official profiles/pages	18	25
No, I'm always critical to such kind of information and check other sources	25	34.72

Table 10 shows that information obtained via social networking websites is not reliable (34.72%) by the Ph.D. research scholars as it is not authentic in nature.

8. FINDINGS

- Mostly Ph.D. research scholars i.e.62.5% belongs to male category.
- Ph.D. research scholars (70.83%) are using internet daily and 47.22% research scholars spend 1-2 hours on working internet.
- 77.78% Ph.D. research scholars use internet for web browsing and 62.5% for social networking.
- Mostly respondents regularly logged on the social networking i.e. 47.22% and 94.44% are using Facebook followed by twitter (63.89%).
- Mostly Ph.D. research scholars spend time on social networking to communicate and access family and friends i.e. 83.33%.
- Mostly research scholars i.e.58.33% do not participate in discussion, they just watch communities for updates and they do not trust on the information obtain via social networking, they always critical to such kind of information and prefer other source.

9. CONCLUSION

In this study is an attempt is being made to evaluate the awareness and use of social networking tools by Ph.D. research scholars of Bundelkhand University, Jhansi. The research indicates social networking tools in learning and followed by as assessment into the awareness and understanding its role to the change in learning world. It is observed that mostly Ph.D. research scholars are connected to each other by the social networking sites to share ideas, views, information and interact with each other to be aware. Social networking allows users to interact and collaborate with each other in a social media in a virtual community. Social networking keeps the people being socialize alert about what is happening in the society.

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INFORMATION NEED AND SEEKING ATTITUDE AMONG THE USERS IN CENTRAL LIBRARY, INSTITUTE OF MEDICAL SCIENCES AND SUM HOSPITAL, BHUBANESWAR : A STUDY

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1. INTRODUCTION

Albert Einstein says "Education is not the learning of facts, but the training of the mind to think". Library is an old age concept and it is such a house where one can get the information in an organized structure. Library helps the individuals to build the career as well as to strengthen the social reputation. Libraries provide the real and virtual spaces in communities for the free and open exchange of ideas fundamental to the society. The future of the library will be shaped in part by the changing environment of our society, our profession and the education system.

Library also emphasizes the information Literacy in this modern and web based environment. There is a sea change in the concept, management and development of library and librarianship during last 25 years. A library is established on the basis of the expectations of society and known needs of the users. On this basis, the objectives and main functions of the library can be deduced. The objective is to assure the users right to know and function is to make library resources available to users.

Daniel Callison (1) in his paper "Evolution of methods to measure student information use" describes the process used by students to locate and use information through the library. If human society is really marching towards progress, it is due to the widespread use of information. In the words of futurist Alvin Toffler the post industrial society is information society in which the striking changes are dramatically arrived directly affecting people and organization in their work place, at home and their behavioral patterns (Toffler, 1970, p.176).

Devadasan, F.J. & Pratap, P.L. (2) describe in their paper "Methodology for the identification of information needs and uses of users". (1997) that it is not only important to identify the information needs of the users, but also put emphasis on finding ways and means of satisfying such needs. In other words, the information needs identifier (INI) would discover several ideas, tools, methods and techniques of satisfying the users in meeting their need as well as design new and novel information services to meet those needs.

Ellis, D. (3) in his paper "Modeling the information-seeking patterns of academic researchers: A grounded theory approach" (1993) gives emphasis on four interrelated stages: searching, accessing, processing and ending. He has also given implications on research and practice; even he has discussed how and why scholars are different than the other academicians.

Wilson, T.D. (4) in his paper "Models in information behavior research" (1999) presents an outline of models of information seeking and other aspects of information behavior. This paper also shows the relationship between communication and information behavior in general with information seeking and information searching in information retrieval systems

2. USAGE OF E-RESOURCES IN LIBRARY

In the last several years, there has been a sharp rise in the number and complexity of e-resources in library collection. Moreover use patterns have witnessed a paradigm shift from print to electronic materials. Because of the proliferation of e-resources and users preferences for the electronic format, these resources are becoming essential mainstays of any library collection. Today's e-resources consists of wide varieties of materials including journals, books, indexes, abstracts, encyclopedias, reference books, aggregator databases and full text or partially full text databases. As these resources change at a very rapid pace and as libraries continue to build larger collections of e-resources, finding ways to manage them effectively from selection to licensing is becoming a major challenge for the librarians of the 21st century.

Advances in information technology, urge for information providers to repackage and generate alternate products, demand of users to have easy to search, browse, retrieve and reuse mode of feature rich non print information. Sources all lead to the present trend of hybrid libraries where irrespective of the form and format, concept is acquired, processed and serviced. It is difficult to think of even public libraries without some content in electronic format, be it the free cd-roms that accompany magazines or books. In the case of higher education libraries, the dependence on e-resources is increasing rapidly over the last few years. In this connection, it is clear that the role of list professionals has become more dynamic and challenging. The technology to provide digital access to library reserve collections has been available for sometimes. However the wholesale adoption of this mechanism has been impeded by a lack of clear copyright and intellectual property ownership laws for the digital environment. (burke). Now with the advent of both information & communication technology and global competition, the scenario for special libraries in India is changing fast. Libraries are struggling in building digital collection and disseminating digital information, due to the following factors such as: lack of ICT infrastructure, lack of it trained manpower, lack of awareness of the digital resources, lack of user demand, lack of financial support, lack of access like computer facilities, lack of knowledge about the digital preservation methods and lack of training for the digital access.

3. ABOUT INSTITUTE OF MEDICAL SCIENCES AND SUM HOSPITAL, LIBRARY

Central Library occupies a place of pride in Institute of Medical Sciences and SUM Hospital and is an essential component of the institute's outstanding research and education mission. It is a most lively place on the Wi-Fi campus providing a safe, comfortable and friendly environment that enables learning and advancement of knowledge and promotes discovery and scholarship. The mission of the library is to facilitate creation of new knowledge through acquisition, organization and dissemination of knowledge resources and providing for value added services.

Besides the comfortable seating and reading environment, the library is well equipped with modern facilities such as e-learning, access to internet and web resources including on-line journals and e-books. The entire housekeeping work of the library is computerized. This library has a good collection of both text and reference books of more than 12500. For better teaching and patient care, the library subscribes 100 hard copy journals of both Indian & foreign. Besides that it has the facility to access 875 current on line journals from Elsevier & ProQuest on health science and medicine. The library has a good collection of 942 CDs & DVDs of different sectors from medicine and surgery with some valuable theses and dissertations.

The library has a well-qualified team of professionals of proper designated with good supporting staff members who are committed to their work and provide service to the users in order to sustain and enhance their motivation and to upgrade their knowledge and skills. The professional staff members are deputed for various training courses, conferences organized in different parts of the state and country to improve their working knowledge.

4. OBJECTIVES AND METHODOLOGY

More than 700 users visit the library in different times including under graduate students, post graduate students, research scholars, faculty members, general practitioners and the para medical staff. The main purpose of this study is to find out the user needs and the utilization of library resources. For this purpose, the last year (2013) library statistics have been collected, analyzed and presented in the study and accordingly some tables and charts are being prepared.

5. FINDINGS

The major findings of the study are as follows:
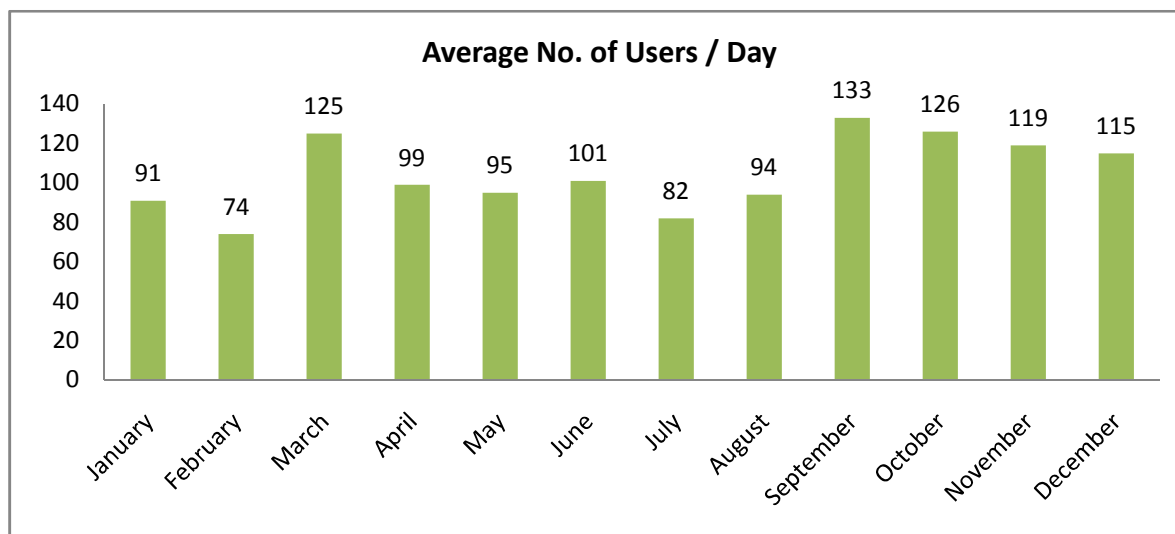

Average No. of Users / Day

Chart 1: Average Number of Users per Day

This chart indicates that more than 100 users visit the library per day in every month to satisfy their needs in support to their study, patient care and to deliver a lecture in the seminars. This number includes faculty members, under graduate students, Post graduate students and the research scholars. They mostly visit the library to show their interest in using the library resources to its extreme value. It is found from this study that the number of under graduate students is more than the Post graduate students and also the faculty members.

The following table also reflects the average distribution of the users in every month. With the total number of the users, the following is my finding of different categories. Among the users the number of under graduate student is more than the others. So their attendance in the library is more than the other users every day.

Table 1: Average Distribution of Numbers among the Users per Day in Every Month

Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Faculty	13	9	30	14	21	15	12	20	33	28	26	22
PG students	9	11	6	13	9	12	15	11	13	11	10	9
UG student	67	52	85	69	64	74	55	61	78	85	82	81
Research scholar	2	2	4	3	1			2	5	2	1	3

Note: PG: Post graduate; UG: Under graduate

The users use this library for various purposes. The following table shows the purpose of using the library among the users. I found from this study that the senior faculty members are interest in reading newspaper as they are interested in seeking the day to day information. The internet is being used by the post graduate students, research scholars and also junior faculty members. The under graduate

students are more interested in using the text and reference books for their study purpose.

Table 2: Purpose of Using Library

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Internet	15	20	21	15	14	17	15	12	20	15	15	15
Reading newspaper	84	52	96	87	78	82	67	68	83	85	112	106
Text books	76	65	114	89	83	94	66	67	104	122	93	77
Reference books	43	34	62	57	63	49	53	45	59	74	68	85
print journals	25	27	22	20	21	24	18	12	15	20	22	22

Note: Internet – where the users can browse off line/online databases with online journals & ebooks.
Reference books – which not to be circulated.

It is found from the study that the senior faculty members are interested in reading news paper and print journals. The research scholars and post graduate students are interested in using internet and reference books. The under graduates are more interested in using text books with internet. The junior faculty members are mostly using the reference books with print journals.

Table 3: Service Access by the Users

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
A	23	19	24	18	24	19	22	24	35	24	22	21
B	14	9	12	13	16	14	11	15	8	12	19	20
C	33	23	56	42	31	41	27	31	54	56	52	51
D	8	11	15	9	10	11	7	10	14	15	14	12
E	13	12	18	17	14	16	15	14	22	19	12	11
Total	91	74	125	99	95	101	82	94	133	126	119	115

Note: A – Reading news paper + print journal
B – Use reference books + internet
C – Use text books + internet
D – Use text books + print journal
E – Use reference books + print journal

I distribute the average number of users into two groups.

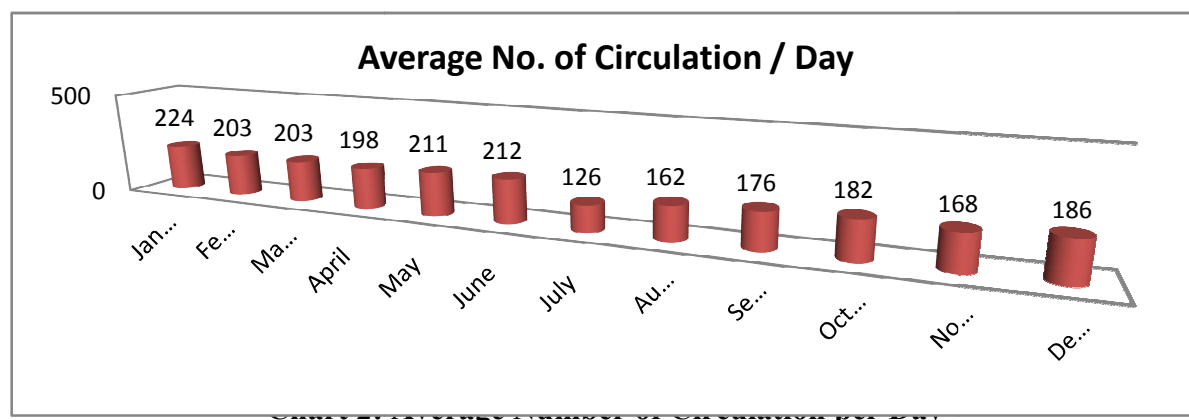### Table: Group 1 is from January – June and group 2 is from July – December.

Group	Group 1	Group 2
Mean	96.8	111.5
SD	18.42	19.58
SEM	8.24	7.99
N	5	6

t=1.2728 DF=9

The two-tailed P value equals 0.2350. By conventional criteria, this difference is considered to be not statistically significant.

This association results the users visit the library at a same average in the whole year. There is no such difference in the p value.

Circulation section of every library put its importance in library management. It is also an important housekeeping operation.

Chart 2: Average Number of Circulation per Day

The author distributed the average number of circulation into two groups.

Table: Group 1 is from January – June and group 2 is from July – December

Group	Group 1	Group 2
Mean	208.5	162.8
SD	9.27	21.94
SEM	3.78	9.81
N	6	5

t=4.6663 DF=9

The two-tailed P value equals 0.0012. By conventional criteria, this difference is considered to be very statistically significant.

It is found from this study that the mean value of the circulation in the 1st half of the year is more that the 2nd half. It means the significant difference between these two groups.

This chart shows the average circulation per day in every month of the year 2013. Circulation task includes the check in and check out of print books only. The under graduate and post graduate students with faculty members borrow the books to prepare themselves for different purposes like talk in a seminar, attend the CME and to assist the faculty members in patient care also. This indicates the most use of print books by the users as the reference books and the serials are not to be check out.
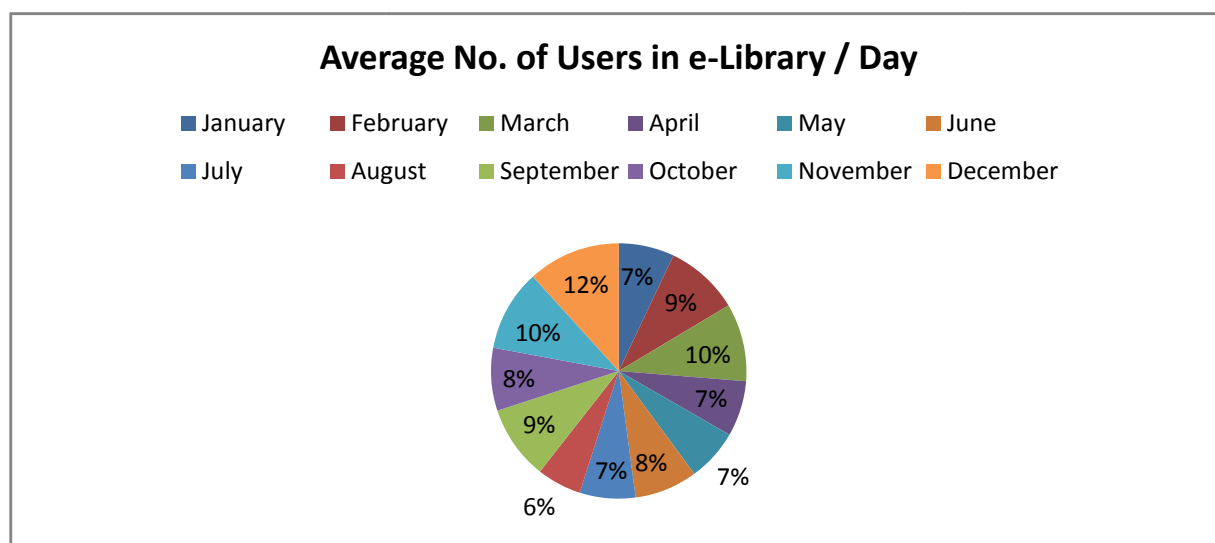

Chart 3: Percentage of the Users in e-Library per Day

I distribute the average number of users in e-library into two groups.

Table: Group 1 is from January – June and group 2 is from July – December

Group	Group 1	Group 2
Mean	17	15.4
SD	2.9	2.88
SEM	1.18	1.29
N	6	5

t=0.9141 DF=9

The two-tailed P value equals 0.3845. By conventional criteria, this difference is considered to be not statistically significant.

This association results that the utilization of e-library does not have the difference throughout the year. The users use these resources with a mean value of same throughout the year.

This is the average % of the users who takes the advantage of the e-library every day. Recent trends of the society and the application of ICT in libraries are helpful to the users of the library. The e-books and the online journals are more essential for the research scholars and the physicians who are associated with the patient care and research also. This library subscribes online database with online journals along with e-books and theses and dissertations. Mostly faculties with Post graduate students and researchers refer those resources than the under graduate students.

Internet-based health information is accessed from a variety of sources, including,
- websites run by organizations;
- homepages owned by individual doctors;
- online support groups where people actively exchange health information; and
- blogs authored by health advocates, caregivers or those pursuing self-help(6)

A US Pew survey indicates that the majority of health information seekers there (66%) begin their search process at search engines such as Google or Yahoo, with 27% using a specific health - related website to start the search (5)
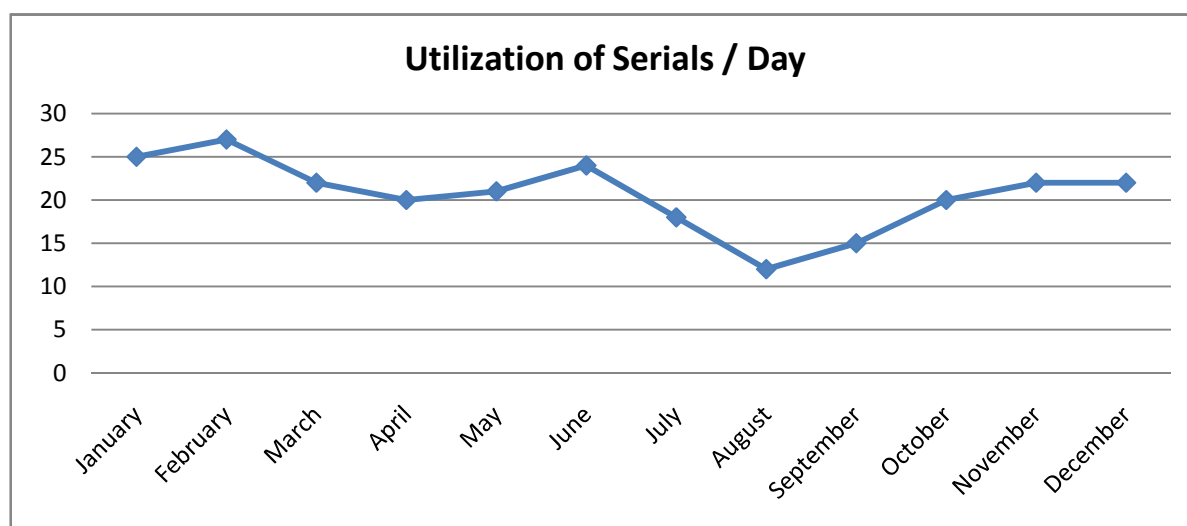

Chart 4: Utilization of Serials per Day

I distribute the average number of utilization of serials / day into two groups.

Table: Group 1 is from January – June and group 2 is from July – December

Group	Group 1	Group 2
Mean	23.17	17.4
SD	2.64	3.97
SEM	1.08	1.78
N	6	5

t=2.8855 DF=9

The two-tailed P value equals 0.0180. By conventional criteria, this difference is considered to be statistically significant.

This association means that the utilization of serials in the 1st semester of the year has more value than the 2nd one.

As per the user demands and also the guidelines of Medical Council of India, the library subscribes more than 100 print journals of both Indian and Foreign. The users refer those journals of different departments including clinical, pre-clinical and super special. The research scholars and the faculty members refer the serials more in comparison to the under graduate students.

6. OUTLOOK
This present century is called as the age of information. We have to access it in various ways. Some may call the running era as the electronic era where information and knowledge are the basic resources. Information communication technology plays a significant role in the library consisting acquiring, processing and disseminating information to its end users. In the educational institutions, to acquire the data sperms from the vast storage of information is a great dilemma. So the academic institutions should progress to implementation of computers which followed by online access. Here comes what the documents we have to collect and where. As per the second law of Library and Information Science by Dr. S. R. Ranganathan, we have to choose the titles which are essential and useful to the readers. In academic institutions, there is a bare need of text books as well as some reference books. Information searching is a complex process which is a perspective of information seeking attitude. But the analysis of information is typical of the dominant paradigm of information retrieval research. Even ICT provides a broad perspective to the users. It can be a useful tool to address problems in medical education.

7. ACKNOWLEDGEMENT
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ROLE OF INFORMATION COMMUNICATION TECHNOLOGY IN LIBRARY EDUCATION

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1. INTRODUCTION

The Internet is a vast, global network, linking computers at universities, schools, laboratories, and other sites. Through the Internet, one can communicate with people all over the world through discussion forums and electronic mail. In addition, many educationally valuable files may be accessed through the Internet. Because of its enormous size and resources, the Internet's educational potential is boundless. There is also potential for access to materials unacceptable for student use. The benefit to students from access to the Internet in the form of information resources.

The brave new era of the information age has ramifications for all disciplines, at the most fundamental of levels. From education, to commerce and music, the Internet impinges on every field where data and knowledge are currency. Arising out of this world-wide network of communications comes the globalisation of information in which hypermedia tools are at the forefront enabling direct user access to information.

As the amount of information on the web continues its exponential increase, the number of users with different goals and interests also expands. It therefore becomes increasingly important that the information available be adapted to suit each user's individual knowledge and aspirations. For example, in traditional web-based educational hypermedia systems, the contents are generally static, in so far as once written, their contents cannot be changed without external intervention. This provides a uniform learning experience to all learners, regardless of their needs and requirements.

Internet is a great educational and communicational tool, where educational information could be wide spread with very good cost-effectiveness balance. Its potential for educational professionals is obvious. Recently we witness a boom of on-line educational searches made by general public.

In providing computer access as an information resource, such as the use of or providing access to or through the Internet, World Wide Web, or an interactive computer, the Library realizes that electronic display is more public in nature than other print media. It also recognizes that while it is impossible to monitor totally all the information or images that can be accessed on the Internet, some amount of control can be exercised. The facilities that is in accord with general community standards.

The Library reserves the right to evaluate, test, use, and implement software and network control and filter mechanisms designed to limit or restrict access to sources of information or images deemed inappropriate for Library dissemination. The Library reserves the right to restrict or attempt to restrict entry into the Library's computer terminals or network of any materials that may not or would not meet the Library's selection criteria or policy for the Library's physical book, film, magazine, or other collections, and the Library may use, employ, or delegate such judgments and functions to outside parties, consultants, Internet service providers or filter services, as well as to staff and directors of the Library. Finally, the Library reserves the right to claim and take advantage of the "Good Samaritan" immunity protections for voluntary use of screening and blocking mechanisms and procedures to restrict access to pornographic, violent, harassing, or otherwise objectionable materials.

Internet can be convenient and efficient in the context of desktop automation; Internet is purely a paperless tool in the communication chain; Internet as network medium disposes of transmission delays imposed by geographical distance. Internet does not cost much; Internet can shrink social as well as geographical distance; Internet can support and sustain academic interests of the research community.

2. INTERNET

A world- wide communication system that links millions of computers has been developed. Such a network is called the Information Super Highway or Cyber Space most popularly known as the Internet. The Internet permits two way speeches which allow millions of people to communicate by either sending messages through their computers or receiving messages from other computers all over the world .Internet in normal usage are a network of computers. In other words we can say that it is a network of networks. Internet made a humble beginning way back in the 1970s in the United States under the Department of Defence-Sponsoring a collection of computer network known as ARPANET. Within a span of thirty years, the system has considerably advanced in research and technology. It connects millions of people and shares information in different fields like agriculture, defense, transport, economics, sports, medicine, education and libraries. Although its popularity is spread over the developed countries, Internet has been only a recent development in India.

3. CHANGING ENVIRONMENT IN EDUCATION

Traditional Environments	New Environments
Teacher centered instruction	Student centered learning
Single sense stimulation	Multisensory stimulation
Single path progression	Multipath progression
Single media	Multimedia
Isolated work	Collaborative work
Information delivery	Information exchange
Passive learning	Active, exploratory, inquiry-based learning
Factual, literal thinking	Critical thinking/informed decision-making
Reactive response	Proactive response/ planned action
Isolated, artificial context	Authentic, real-world context

4. LEVELS OF INTERNET USES BY THE STUDENTS

For Education*:* In an attempt to obtain a better understanding of the rights that need to be cleared by the educational sector, a list of possible educational uses of material available on the Internet was prepared detailing activities ranging from passive uses such as viewing, browsing and listening to active uses such as downloading, reproduction and printing of works, and cutting and pasting of material. Other potential educational uses include presentations by teachers and students (with target audiences located in the same classroom, in another classroom or in a different location) and the uploading of material on either an Intranet or Internet site, with both secure and public access.

For Distance Education: Long before computers were invented, people were learning from home via correspondence courses. For the geographically isolated and for adult learners juggling the demands of work and family, distance education has provided otherwise impossible opportunities. Most commonly, distance education students receive a set of materials to study, and then take tests to demonstrate their mastery of that information. Clearly missing from this model is classroom interaction. They are currently beginning a major initiative to use computer networks to provide access to information and enhance interaction among students and 4 teachers. Unfortunately, many other distance education programs do not live up to the Open University's high standards. Many distance education projects are experimenting with video conferencing techniques. An expert's live presentation can be sent to thousands of students. Students can ask questions from remote locations.

Questions and answers can be broadcast to all students participating. A more interactive use of technology to support distance education involves the use of mailing lists, real-time chat, to foster interaction among students and teachers on a reasonable scale. Since these technologies are many-to-many instead of one-to-many, they afford more real interaction. For students taking classes at The Open University, these technologies are providing new opportunities for students to learn from one another.

This new technology can be used not merely to reproduce traditional education, but to help reform it. New educational technologies can provide opportunities to introduce new educational ideas. Most distance education projects simply translate an old medium (the classroom) into a new one (virtual space) without reflecting on either what the new medium is good for or how the old medium needs to be reformed.

For Information Retrieval: Using the Internet as an electronic library has a number of pedagogical benefits when used in combination with other information sources. The volume of information available exceeds that possible within a library, and much of that information is more current than is possible in printed books. It's significant that on the Internet all rural and urban, rich and poor gain access to the same quantity and quality of information.

For Electronic Journals and Newsletters*:* Electronic journals and newsletters are increasing in the humanities and science area despite ongoing debate about copyright protection, quality, refereeing processes and access. Their acceptance as journals of record, with equal status to their printed counterparts, is proving a slow process, with many academics preferring to follow the traditional avenues of publication and unwilling to submit material to the online versions.

For Subject Guides: Subject guides provide lists of information resources available on the Internet and are easily navigated via a topic hierarchy. They can also be reached through search engines and catalogues on the World Wide Web which allow searching for resources by subject keywords.

For Information Resource: Besides its ability to enhance communication between individuals, the Internet is slowly taking on the role of information storehouse, though its main use at present is for entertainment and the supply of general information. It can be used as a guide to the location of source material, providing access to library catalogues and archival listings.

Increasingly information providers are using the Internet to enable direct access to primary sources documents, such as online newspapers, electronic journals, manuscripts and other electronic texts and images. This new technology offers the facility for viewing, searching and downloading such material. The Internet is daily becoming more useful to the researcher. The amount of information presently available on the Internet is enormous numbering some tens of millions of web pages alone and growing daily. It is accessed from a variety of sources.

Internet Uses at Home: Participants in all focus groups stated that they spent a couple of hours on the internet each day. Most students had access to the internet at home, but usually they needed to share computers with siblings. Students reported that the internet was the first resource accessed for their assignments. Most felt that it was easier to find the information they needed using the internet, as searching through books was often more time consuming and more difficult to find the relevant information that they needed. When students undertook research via the web, the preferred method they used was to start with a search engine such as *Yahoo or Google*. Once the user search was undertaken they would often access the first site listed. At home teachers used the internet primarily for planning excursions; planning lessons and activities for the classroom; email and hotmail as well as banking and other personal activities.

For Communication*:* Electronic mail is a popular way for communicate, and having an Internet account is one means of accessing an e-mail system. The speed with which one can send and receive mail with this system enhances communication and, in addition, it is possible to attach files just as one

would enclose items with regular letters. A file might be a conference announcement with application form to be completed and returned by email, or Sit may be a draft journal article seeking comment from a colleague. E-mail has been called "the best thing about the Internet", in that it allows one to send a message around the world and to receive an answer moment later.

For Entertainment: Students used the internet also for games; entertainment; shopping; email and hotmail; chatting; downloading music and for homework assignments. The internet served a social purpose for many of the participants by engaging them in two-way communication through:
- MSN Chat (primarily)
- Massively-Multiplayer Online Games (MMOG)
- Virtual Reality Communities
- Special interest websites with two-way communication capabilities such as Forums/message boards; chat rooms and blogs.

5. INTERNET IN LIBRARY SERVICES

Using the mouse the Library staff can click on any item of their interest and information on the particular subject will automatically appear on the screen. Penguin India, Foundation Books, Allied Publishers, Springer, Elsevier, Kluwer and other publishers are tied up in the web to help book lovers while placing orders for books and subscribing journals through on-line.

In Technical Section: A subscriber, teacher, library staff can use the on-line catalogues for selecting recent editions of books. The Librarian can send an order via Internet related publisher and avail discounts too. It also provides instant information for library executives regarding the subscription of journals; sending reminders for missing issues and informing payment clearances.

For example to find the information on recent publications on religion, philosophy Science and Technology and Indian culture the users can use the publisher's sites like:
- Motilal Banarsidas: www.mlbd.com
- Indian Books Centre: www.indianbookscentre.com
- Munshiram Manoharlal: www.mrmlbooks.com
- Elsevier: www.elsevier.com
- Tata Mc-Graw Hill : www.tatamcgrawhill.com

For Commercial Databases: Commercial databases such as bibliographic databases, formerly only available on CD ROM or by remote online access, can also be accessed via the Internet. Such databases usually require separate paid subscriptions by individuals or libraries. Staff and students at the subscribe library can use databases from their desktops via telnet, a facility which allows one Internet host computer to become a terminal of another Internet host computer.

Internet in Reference Section: The Academic library especially at the University level associates with outstanding scholars who expect readymade information like SDI (selective dissemination of information). To satisfy them every librarian should maintain close contact with professional and non-professional bodies like INSDOC and INFLIBNET –INFONET etc., The staff should refer various types of information sources available on Internet. They may be commercial databases, open access databases, licensed databases and full text articles of journals.

For example the Reference librarian expects the On-Line services offered by:
- Inflibnet centre: www.inflibnet.ac.in
- Cambridge University Press: www.cambridge.org
- Springer: www.springeronline.com
- Verlog, Emerald: www.emdowns.com
- Elsevier: www.elsevier.com
- Ebsco: www.ebsco.com

- publishers etc.

Internet at present has become a multi-user facility within the reach of the common scholar. It is launched by exercising the search engines which help the reader in the library while searching vast collections of files like education, industry, sciences, fine arts, music and trade etc., In case a reader spots certain information regarding biotechnology, he/she can download the online information across lease lines from a far away site to his/her computer. To do so the reader has to first go through the different search engines like:

- National centre for biotechnology information: www.ncbi.nlm.nih.gov
- BIOSIS: www.biosis.org
- Environmental science: www.envirolink.org
- Encyclopedia of Britannica: www.inflibnet.ac.rin

In general if the Librarian types the referred protocol he/she gets a list of subjects preserved in the databases of INSDOC, INFONET or private online service vendors. Similarly a web of on-line dictionaries in humanities gives a list of languages choices with translation, acronyms biographies etc. The full text information of Encyclopedia of Britannica is readily available at INFONET homepage www.inflibnet.ac.in. Likewise the world wide web of sports provides abundant information on sports of numerous types. There is another web site on photography with guidelines to take good pictures and handling cameras in special situations. Likewise in sciences, social sciences, humanities, engineering and other subjects the library professionals can browse the specific sites and collect the required information on hard copy or soft copy.

6. LIBRARY CATALOGUES

Library catalogues throughout the world can be accessed via the Internet thus allowing historians to search these huge library databases from their own desktops. One can contact a library directly or go through a site.

7. INTERNET BOOM IN INDIA

The Internet has become an important source of knowledge and information. Internet has revolutionized the access to information. With the strike of a button, users can get any relative information through the Internet. The Internet is a collection of web addresses, which is jointly called as the World Wide Web (www).

With the Internet Boom in India there is rise in the activity of the information technology sector. More and more companies are coming up as a part of the IT enabled services, which are contribution to the Internet boom in India. Several search tools have been designed to help navigate the Internet. These include Gopher, Archie, Veronica, WAIS, and the software packages Mosaic and Netscape. These individual tools are often used to reach the same information but vary in sophistication and ease of use. On the Internet the information is searched with the help of search engines and one such well known search engine is the Google - and it is a little genie, you wish for it and bang it's in front of you on the screen. There are dedicated Internet sites, which supply information about various aspects like education, business, finance, geography, scientific developments, inventions, and many more. With the rapid development in the IT sector, all most of the educational institutions, have included internet as essential part of the library, because Internet is the best source of information provider for education.

8. CONCLUSION

Internet is a great educational and paperless tool in the communicational chain, where educational information could be wide spread with very good cost-effectiveness balance. The benefit to students from access to the Internet in the form of information resources. Its potential for educational professionals is obvious. New educational technologies can provide opportunities to introduce new

educational ideas. Internet can support and sustain academic interests of the research community. Internet as network medium disposes of transmission delays imposed by geographical distance. Internet can be convenient and efficient in the context of desktop automation.

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TEACHERS, TECHNOLOGY AND TRANSFORMATION

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1. INTRODUCTION

Addressing the students of Allahabad University in 1947, Pt. Jawaharlal Nehru, the first Prime Minister of India said "University stands for humanism, for tolerance, for reason, for the adventure of ideas and for the search of truth. It stands for the onward march of the human race towards even higher objectives. If the universities discharge their duties adequately, then it is well with the nation and the people". This succinctly presents the 'idea of the University' and the role that it should play in transformation of our societies. For centuries, the university has been a place for teaching, research, and extension activities in all domains of knowledge. It differs from a single discipline research centre, a college focusing on teaching, and even from an advocacy agency such as Non-Governmental Organizations (NGOs). It should be an independent institution that has the moral and cultural capacity to pursue knowledge in its purest form. It is *not* same as 'higher education'. University as an idea is an ecosystem of teachers, students, teaching support personnel, and the society it serves. Therefore, it is always dynamic and is in constant state of change. It spreads higher education, but it is not just a space where students and teachers meet to exchange ideas; it is all about democratic values, freedoms, truth, innovation, business and cultural emancipation. It is a space where society expects little or no state control, as Popper says "too much state control in educational matters is a fatal danger to freedom" (Popper, 1945). A true university is *neither* bound by space and time considerations, *nor* limited to constraints of curriculum and transactional processes. It should operate within the 'academic freedom' defined in texts of international understandings.

2. ROLE OF TEACHERS

On 11 November 1997, in its 29th session of the General Conference, the United Nations Educational, Scientific and Cultural Organizations (UNESCO) adopted "Recommendation concerning the Status of Higher-Education Teaching Personnel", which states "Institutions of higher education, and more particularly universities, are communities of scholars preserving, disseminating and expressing freely their opinions on traditional knowledge and culture, and pursuing new knowledge without constriction by prescribed doctrines. The pursuit of new knowledge and its application lie at the heart of the mandate of such institutions of higher education. In higher education institutions where original research is not required, higher-education teaching personnel should maintain and develop knowledge of their subject through scholarship and improved pedagogical skills" (UNESCO, 1997).

The UNESCO recommendation is a very useful document that Governments, universities, teacher unions and teachers themselves may seriously look at as guiding ethical principles of professional practice. A critical review of the recommendations shows a long list of duties and responsibilities of a teacher inherent in our academic freedom. Some of these are:(a) to teach students effectively within the means provided by the institution and the state; (b) to conduct scholarly research and to disseminate the results of such research or, where original research is not required, to maintain and develop their knowledge of their subject through study and research, and through the development of teaching methodology to improve their pedagogical skills; (c) to base their research and scholarship on an honest search for knowledge; (d) to observe the ethics of research involving humans, animals, the heritage or the environment; (e) to respect and to acknowledge the scholarly work of academic colleagues and students; (f) to refrain from using new information, concepts or data that were originally obtained as a result of access to confidential manuscripts, funding applications and papers

in the peer review process; (g) to ensure that research is conducted according to the laws and regulations of the state and does not violate international codes of human rights; (h) to avoid conflicts of interest and to resolve them through appropriate disclosure and full consultation with the institution employing them; (i) to handle honestly all funds entrusted to their care by the institution or other agencies for research or for other professional work; (j) to be fair and impartial when presenting a professional appraisal of academic colleagues and students; (k) to be conscious of a responsibility, when speaking or writing outside scholarly channels on matters which are not related to their professional expertise; (l) to undertake such appropriate duties as are required for the collegial governance of institutions of higher education and of professional bodies.

3. DO MEDIA INFLUENCE LEARNING?

What technology can do to help teachers and teaching? Can it help improve student learning? Those of us working in the field of educational technology for years know the potentials of technology use in education. It is less about technology itself than about appropriate use of technology for education. Do media influence learning? -- is the often asked question following the research by Richard E. Clark. Research studies called media comparison studies have revealed that learners equally learned well, irrespective of the means of presentation. Clark (1983) emphasizes that "media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries cause changes in our nutrition". Clark suggested that research should focus instructional methods that are crucial in learning, whereas Kozma (1991) refuting Clark's assertion recommends examination of how media influence learning.

Ever since Thomas Edison predicted in 1913 that books will be soon obsolete in schools and motion picture will be prevalent in next 10 years – which is yet to happen, educators all over the world have experimented with numerous media and technologies – each having unique attributes of their own and affording different options and capabilities. From numerous innovations and research we know that efficient, effective and engaging learning is about appropriate use of the available technologies and their attributes to optimize student learning. Notwithstanding the debate on influence of media on learning, media and technologies are here to stay in education as they "do create different cognitive processes at different levels of efficiency (with regard to speed, ease, effectiveness). In other words, the form in which information is presented can determine how it is processed in a mind, and hence how it can be learned" (Cobb, 1997). Elsewhere (Mishra, 2006), the author has presented use of technology in learning at three planes – learning *from* technology, learning *in* technology and learning *with* technology.

4. LEARNING FROM TECHNOLOGY

Learning from Technology*,* is a situation where different media are used as carriers to deliver information from which we learn, e.g., reading a *textbook*, listening to *radio* and watching a *television* programme. We learn from all these sources of information. Meaningful learning here is a generative process requiring learners to select relevant information from what is presented, organise it into a mind map and integrate the new map with prior learning. However, most of the time learning from technology is passive, and thus can be said to be least effective. To enhance learning from technology, it is important that the source (media) of learning be designed specifically for learning, making best use of its own symbol system. In order to learn from television, that uses iconic symbol system to represent knowledge, it is necessary that the learners have some prior experience on the topic through media notes, to establish relevance of the topic to individual learner. The use of learner control over media also enhances learning, as the learner can pause and play the programme to think, reflect, analyse and assimilate new learning.

5. LEARNING IN TECHNOLOGY

Learning in Technology is an environment facilitated by the use of technology to learn from. In such a situation, technology is *integrated* rather than used as a stand-alone media. Thus, learners learn in a

technological environment through multiple media. Such a situation is very much like a distance learning situation, or a teleconference based teaching-learning environment that enables a virtual classroom situation. The use of web-based learning or online learning also falls within this category. The learning environment demands certain kind of responsibilities from the learners and assumes self-regulation and internal motivation as essential components of successful learning. Participation in the technological environment becomes crucial for learning to happen and can facilitate collaborative and cooperative learning through the use of new information technologies such as e-mail, discussion boards and chat facilities available on the Internet. Learning in technology is an improved approach towards effective learning and subsumes learning from technology. It is a much demanding situation for instructional designers and course developers, as planning and implementation of instructions are separated, where planning takes more time and effort.

6. LEARNING WITH TECHNOLOGY

Learning with Technology is a creative use of technology to allow learners to learn by working with technology, which means instead of watching a video programme or interacting with a multimedia, the learners are engaged in preparing the video or developing the multimedia. The new information technologies, particularly computer and the Internet provide this opportunity to learn with technology. For example, to learn web-based learning, students can work directly on a learning management system platform to create a web-based learning environment. It is argued by Resnick (2002) that technology should be used to creatively express the hidden potential of the learners, and thus demands digital fluency. This approach goes with the constructivist approach to learning. Learning *with* technology envisages students' interpretive representation of knowledge expressed through appropriate and creative use of technology such as multimedia, TV or radio. Such an approach towards learning has been proved successful in training rural women to use video by the Deccan Development Society, India and develop literacy-training materials in the Commonwealth of Learning – Literacy Project in India. Bonk *et al* (1996) reported that in an experiment of learning with technology, fifth and sixth grade students created multimedia on weather. The results show significant gain in student learning and interest in learning science. Learning with technology puts the students in a more active role, where they creatively engage in understanding and identify the hard spots with appropriate meta-cognitive solutions to tackle the difficult part. As learning by doing is the essence of this approach, it is definitely superior to the other two applications of technology in learning. However, it requires considerably high resources for implementation.

We can see that all the three approaches to technology applications in learning have their specific roles to play, and therefore, as teachers, we must choose mixed use of technologies depending on the requirements of learning task. In *Transforming Education: The Power of ICT Policies* (UNESCO, 2011), Robert Kozma presents a conceptual framework for use of information and communication technology (ICT) in education, which is similar to this approach and provides a three step ladder – Knowledge acquisition, Knowledge deepening, and knowledge creation.

In this context it is important to highlight the importance of teacher capacity building and continuous professional development of teachers to use ICTs in innovative ways. The National Mission on Education through ICTs in India has been working in this direction through several of its schemes on content development and capacity building.

7. EDUCATION AS TRANSFORMATIONAL

Transformation has several connotations in mathematics, statistics, physics, chemistry, biology, law, sociology, etc. While we are concerned with educational transformation, the focus here is on the broader sense of its use referring to social transformation that happens due to education, and interventions of teachers. Teachers play the role of a *change agent* to bring in social transformation through their action. Generations have followed their teachers as role model, and therefore, the possibility of transformation due to appropriate teacher behaviour in use of technology to improve

student learning is positively linked. Universities need to create appropriate enabling environment to facilitate use of technology in teaching and learning.

In order to facilitate the transformation processes, universities need to have appropriate infrastructure and policies for Open Access to scientific information and research, production and use of Open Educational Resources (OER), and guide to appropriate use of social media.

8. OPEN ACCESS

Open Access (OA) is "free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of … articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited" (BOAI, 2002).

OA has gained momentum due to the rising cost of journals, and the initiative of scholars and scientific establishments to respond to the situation through different ways to promote OA to scholarly information such as the Green route, Gold route, and recent one Platinum route.

The green route refers to OA archives/repositories through which authors provide access to their work as pre-print or post-print and with or without publisher's embargo. The earliest OA archive is arXiv developed by Paul Ginsparg in 1991 at the Los Alamos National Laboratory, USA, and currently hosted at the Cornell University providing access to over 974,813 e-prints in Physics, Mathematics, Computer Science, Quantitative Biology, Quantitative Finance and Statistics. Bjork et al (2010) estimated that 11.9% of all scholarly articles published in 2008 were available through green OA. The green route can take the form of institutional repositories or subject repositories, and most OA advocates see this as least problematic and achievable road to OA.

The gold route is about journals that are available online for free access. The Directory of Open Access Journals (DOAJ) has over 10,000 journals in end of September 2014. Björk et al (2010) estimated that 8.5% of all scholarly articles in 2008 are available through gold OA. Gunasekaran and Arunachalam (2011) reported that of the 4603 papers contributed by Indian researchers reported in *Web of Science – Science Citation Index Expanded* in 2009, 15.88% were published in OA. The gold OA has shown many innovative access routes such as the mega journals like PLOS ONE that published about 31,500 articles in 2013.

A third model of OA is emerging in the recent past due to the influence of the Web 2.0 technologies. It is called the platinum route – the social networking approach to sharing research work. While it is a self-archiving approach, it is neither institutional nor subject-based. Some of the popular research works sharing platforms are Mendeley, Academic.edu, and Research Gate. UNESCO in November 2011 launched the Global Open Access Portal (GOAP), which this author helped develop as a staff member at that time, provides knowledge snapshots of OA developments in different countries of the world, linking to different initiatives, projects, repositories and journals.

9. OPEN EDUCATIONAL RESOURCES

Almost at the same time when researchers and librarians were trying to create a system and movement to provide OA to scholarly information, another group of academics were engaged in improving the quality of teaching and learning through sharing of educational materials over the Internet. After all, teaching is one of the scholarly activities within the world of scholarly communication, and technological developments made it easier for scholar teachers to share their educational learning content freely using the Internet. In 1998 David Wiley coined the term 'Open Content', and in 2001 MIT announced its OpenCourseWare initiative. In 2002, UNESCO organised a forum on the *Impact*

of Open Courseware for Higher Education in Developing Countries that defined Open Educational Resources (OER) as "the provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for no-commercial purposes" (UNESCO, 2002). Since then the OER movement has not only grown leaps and bounds, but is also helping scholars to share their educational content easily through a variety of platforms and initiatives. In June 2012 UNESCO and the Commonwealth of Learning organized the World OER Congress that released the Paris declaration of OER urging governments to encourage development and use of OER and educating stakeholders about appropriate licensing models.

10. SOCIAL MEDIA

The growth of social media such as blogs, wikis, micro-blogging and social networking on the World Wide Web (WWW) has created new opportunities for teachers to share their work rapidly and also to share their innovations as well as establish 'scientific paternity'. The statistics about social media use is progressing so fast that it is changing every minute. There are almost 1.15 billion Facebook users, 500 million tweets happen over a day in Twitter, and more than 100 hours of videos are shared in YouTube every minute. How can these social media be used to improve teaching and learning?

While social media is considered superfluous and merely a tool to distract ourselves from real-time events and discussions, Van Eperen and Marincola (2011) recommend that such attitudes be shelved and we recognize social media's power in communicating advancements in the scientific field by acknowledging that successful communication can only be achieved by employing the channels in which the general public is currently engaged. A recent study by Gruzd et al (2011) reported that online social media tools are gaining acceptance and trust in academic circles; scholars use social media to keep up-to-date with the developments in their research area; many academics like to read and comments on blog posts; academic social networking sites are becoming popular, and only 7% scholars surveyed reported that social media activities are counted towards tenure or promotion reviews at their home institutions.

11. CONCLUSION

It is high time that universities make policies and guidelines to use social media; OER and OA to create an environment of openness that will transform not only the educational landscape, but also bring in more social transformation. As teachers we have significant roles to play in the transformation process of the universities to adopt technology. We as champions of ICT use in education can build pressure to improve ICT infrastructure to create that much needed enabling environment for transformation. Teachers and Technology together can accelerate the Transformation process.

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Section VI
IMPRESSIONS ON
PROF. B.K. CHOUDHURY

MY REMINISCENCES ON PROF. B K CHOUDHURY

Prof. B. Ramesh Babu
Professor (Retd), University of Madras, Chennai, Tamil Nadu, INDIA. &
Former Visiting Professor, Mahasarakham University, Mahasarakham, THAILAND.
Email: beerakarameshbabu@gmail.com

1. PROLOGUE

It is my pleasure and duty to recollect my memoirs with Prof. Choudhury, when some of my friends closely associated with him planned to bring out a Festschrift in honour of him. I myself voluntarily came forward to edit the volume as he is one of my close friends and professional colleague. Though the festschrift was planned long time back but somehow it was not materialized. When we sat for a dinner meeting in Prof. K C Das residence at Berhampur during April 2014, suddenly the idea was mooted and all our friends and professionals agreed to contribute papers for the volume. Thus the seed for the festschrift for Prof. Choudhury was sown in Berhampur, the home town of him. It was just a coincidence!

2. MY FIRST CONTACT

My association with Prof. BK Choudhury is more than two decades. I met Prof. Bijay Kumar Choudhury in the campus of Vani Vihar, Utkal University, Bhubaneswar during 1995 when we were on some academic assignment invited by Prof. Pitambar Padi. I saw him as a simple and humble person dressed with white pyjama and kurtha and we visited ISCON Temple there. I observed him as a pious and God fearing personality. Earlier, I knew about him through his articles published. Since then we are associating in many academic and professional forums.

3. MY VISITS TO SAMBALPUR UNIVERSITY

In 2001 January I was invited to the Academic Staff College by the then Prof. R K Rout and that was my first visit to the Jyothi Vihar (Sambalpur University). During that time I met Prof. Choudhury and his family. Since then I have been visiting there for a number of academic programmes such as UGC visiting fellow, examiner, seminars, PhD viva-voce examinations etc. All those times I had the privilege of enjoying the hospitality and spent good times with him and his colleagues and students.

4. HIS PERSONAL QUALITIES

He is quite active and helpful to me in my professional career. He has a lot of friends throughout India. He is a man of simplicity and no artificiality. He has been a good teacher committed to the cause of the education, training and research in Library and Information Science and development of his wards, namely, students at all levels. He is an unassuming, soft spoken, non-controversial and friendly person with full of empathy. Through his strong network and friends, he used to keep himself aware of all the professional developments. He would not hurt the feelings of others.

5. AS AN ADJUDICATOR

I had the privilege of working as an adjudicator for his PhD students and M. Phil students. In turn he also served as an adjudicator for my PhD students in one or two occasions. As an adjudicator he never compromised the quality and wherever he feels to comment, he did so at the interest of the candidate and maintained the academic standards.

6. HIS VISITS TO CHENNAI

Prof. Choudhury always respects my requests and honours me by attending the academic programmes I conducted in Chennai either at the University of Madras or in the SRM University. I cannot forget in my lifetime that my retirement function during June 2012 at the University of Madras, Marina Campus conducted by my research scholars, friends and students and many professional friends from across the country and South Korea has graced. He also attended that function and wished my retirement life.

7. EPILOGUE

I am sure that all of you will agree that he is a very warm person and equally kind. It is very hard to find people like Prof. Choudhury. I pray Almighty to shower his blessings on him and his family members with a happy, peaceful, wealthy and healthy life.

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PROFESSOR B.K. CHOUDHARY AS I KNOW HIM

Dr. A. A. Vaishnav
Professor & Head (Retd), Department of Library & Information Science,
Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra, INDIA.

My association with Professor B.K. choudhary dates back to 1991, when we were participants of UGC Refresher course organized by SNDT Womens' University, Mumbai during 6th January to 2nd February, 1991. My association with him grew much more than formal association with the passage of time from professional relationship to family relation.

At the academic front he is associated with Dr. Babasaheb Ambedkar Marathwada University (BAMU), Aurangabad during last 15 years, as a resource person for UGC refresher courses, UGC visiting fellow, subject expert for delivering lectures to M. Lib. I. Sc., & M.Phil. students. Being a researcher he has also evaluated Ph.D. theses of Dr. Babasaheb Ambedkar Marathwada University (BAMU).

At professional front Prof. B. K. Coudhary is cool, soft spoken, simple, affectionate, accessible and through gentle man, who grew close association with all LIS family members.

At personal level, Prof. B.K. Choudhary is well known to my whole family. He makes it a point to visit us as and when he comes to Aurangabad. He is a man of simplicity and no artificiality.

Professor B.K. Choudhary is friend, philosopher and guide. He is an energetic, ever accessible, ever smiling person, young man of 65 years.

I congratulate and welcome you to the 2nd inning of life, where you have challenges to conquer and dreams to aspire.

I wish you on my personal behalf and on behalf of my family a very happy super annuation. Me and my family members pray all mighty to keep him happy and healthy.

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A FESTSCHRIFT FOR
PROF. B.K. CHAUDHURY : MY IMPRESSION

Dr. K.C. Das
Head, Department of Library and Information Science,
Utkal University, Bhubaneswar, Odisha, INDIA.

We intended this Festschrift as a celebration of Prof. Chaudhry's 65th birthday. Thus this volume pays tribute to his life's contribution to the study of **Collection Development and Management of E-Resources in libraries.** Prof. Chaudhury personally influenced and trained three generations of students and research scholars including some of these authors who have contributed articles in this volume. The goal of the festschrift /memorial is to collect excellent chapters close to the heart of the honouree. These works usually spring from deeply held emotions of admiration,   respect, affection, and friend-ship. The genre serves as a way for scholars to release these emotions and, immemorial, as a way to heal the loss of the honouree.

He left a lasting impression on the careers of several of us, which we relay below. Cataloguing Practice –a practical book gave us a heartfelt testimonials' to the life and work of Prof. Chaudhury, which highlight the diversity of his research and its impact on scholarship. More importantly, these contributions reflect how Prof. Chaudhury's colleague, teacher, and mentor reached out and touched so many other scholars. It is a gift of scholarship to his memory.

I met in 1984, Prof. Chaudhury at my home town Berhampur, Odisha, where I was working as professor cum principal of College of Library & Information Science, SMIT. In the first meeting itself, I was quite impressed for his simplicity and amicable behaviour. Later on many occasions we met each other and our bond of relations turned into friendship. I treat him as my elder brother, who always inspires me and give me guidance and show me correct path as and when I need his help and guidance. As for as I know him professionally, he is an excellent teacher and loveable by all. This fact has been corroborated not only by his students but also his authority. He has contributed to our profession a quite number of books, journal articles which were published in various International and National journals. Although he was retired from the service, we do not think Prof. Choudhury will stop his academic endeavor as he is a man of letters and his commitments to profession will not allow him to sit in idle and isolation.

Last but not the least, I prey to Lord Jagannath to give him strength and increase his moral to remain strong and in sound health and inspire to our teaching fraternity and his loveable students, scholars and friends and well wishers.

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MEMOIRS ON PROF. B.K. CHOUDHURY

Prof. Jaideep Sharma
Department of Library and Information Science,
Indira Gandhi National Open University (IGNOU), New Delhi, INDIA.

Professor Bijay Kumar Choudhury was my guide for the Ph.D. degree in Library and Information Science from Sambalpur University. I share the same relation with him today that I developed while working for my Ph.D. for which I was registered in 1995. Getting the warmth of a guru-shishya relationship for 20 years has been a big fortune for me. I gained immensely from him during this long association. He has always been concerned about my career.

As a guide he gave me the space and liberty of working independently till any clarification was sought from him. At the same time his expertise and long experience in the field were always available in plenty. He is a person who does not believe in keeping distance with his students. He would always treat me like a family member that would give the confidence of sharing any problem or concern with him. His availability at my convenience for discussions and clarifications is a rare privilege I had as a student.

Prof. Choudhury has the distinction of studying for his LIS qualifications from well known departments at Dharwad, Karnataka, Jadavpur University and Utkal University. He specializes in Collection Development and has taught Library Cataloguing. He has to his credit a book on Cataloguing of Non- Book Material. He taught for more than 30 years with a prior experience of 12 years in practical librarianship. He has under his belt 13 Ph.D.'s awarded to his students; around 8 are yet to be awarded who are still researching. It speaks of his interest in research which he is undertaking after retirement.

Professor Choudhury is the proud father of a son and a daughter. Both are highly qualified engineers excelling in their area of work. His daughter (having M.Tech Degree) is an assistant professor in one of the best technical university in Bhubaneswar and the son works in a multi-national IT corporation in Bengaluru. The first description of my guru-mata by my guide till I had seen her was 'made of gold' is really true. Her heart is also as pure as gold. Madam Choudhury is a pious devout home-maker who has to be given all the credit of shaping up the careers of the children. Her blessings saw me sail through the journey of Ph.D. and ever after. May God Bless them with good health and a long life.

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PROF. BIJAY KUMAR CHOUDHURY : IMPRESSION

Dr. Ranjita Niladri Dash
Librarian, Babaria Institute of Pharmacy, BITS Edu Campus, Vadodara, Gujarat, INDIA.

Professor Bijay Kumar Choudhury was born to Late Shri. Madhab Choudhury and Late Smt. Bishnupriya Choudhury at Berhampur on 15th November, 1948. A studious student having great passion towards learning and reading, attracted the young Bijay towards books from the very childhood. Ultimately his passion fetched him graduation, post-graduation and doctoral degrees in Library and Information Science. He successfully completed his B. Lib Degree in 1971 from Jadavpur University and immediately got absorbed as the Junior Librarian at the Central Library of Orissa, University of Agriculture & Technology, Bhubaneswar, where he continued to serve with all dedication and efficiency for 12 years. During this period, Prof. Choudhury obtained his M.A. Degree and Diploma in Russian Language from Utkal University in the year 1975. Subsequently, Prof. Choudhury added two feathers to his cap by obtaining M. Lib. Sc. from Karnataka University in 1979 and Ph.D. Degree from Utkal University in 1993.

Having worked on the "Use of Resources and Services in the University Libraries of Orissa: An Evaluation", for his doctoral research, Prof. Choudhury has contributed significantly to teaching and research in the areas of Cataloguing, Collection Development, Collection Management, ISB, User Studies, Library Networking, Academic Library System and Use and Evaluation of Resources and Services.

During his more than three decades of teaching career, Prof. Choudhury served several prestigious institutions and university departments of Odisha, including Godavarish P. G. College of Vocational Studies, Bhubaneswar, S. B. Women's College, Cuttack, Department of Library and Information Science, Utkal University, Bhubaneswar and P. G. Department of Library and Information Science, Sambalpur University, Burla. Besides, he has worked as examiner to more than 30 universities of the country during his career. As member of the Department Board Studies of Utkal University and Sambalpur University, Prof. Choudhury's contributions have also been highly admirable.

His research contributions, has earned him laurels and reputation all over the country. He has produced more than two dozen Doctorates, 13 M. Phils. and 52 Masters. Prof. Choudhury is still engaged actively in research and has around half a dozen doctoral students working under his guidance.

Prof. Choudhury has been a versatile and prolific writer too. To his credit, he has three books, another three edited books, 70 articles in journal, edited books and conference proceedings, and one UGC sponsored minor research project.

His contributions as an administrator has also, always been acclaimed. Prof. Choudhury has served as Head of the Department, member and coordinator of several institutions, academic bodies and sponsored programs during his academic career. He is life member of Indian Library Association (ILA) and Indian Association of Teachers in Library & Information Science (IATLIS). He also worked as the Regional Secretary of IATLIS during 2005. He has organized several seminars, workshops and refresher courses successfully during his career and himself participated and presented papers in three international, fifteen national and thirteen regional level conferences.

Prof. Choudhury's expertise in the field gets further clarified from his participation as a resource person to design courses in Library and Information Science at different universities of the country, invited lectures delivered at several academic meets, refresher courses and workshops, and working as

subject expert in selection committees of different institutions and universities all over the country etcetera.

During his long career, Prof. Bijay Kumar Choudhury has set exemplary academic precedence that has no comparison. His academic contributions has not only enriched and strengthened the discipline, but has also created a brand of scholars to carry forward his legacy.

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PROF. B K CHOUDHURY : A VIVACIOUS PERSONALITY AND A TRUE KARMAYOGI

Dr. R.N. Mishra
Associate Professor, Dept. of Library & Information Science,
Mizoram University (A Central University), Aizawl, Mizoram, INDIA.

'Try not be a man of success, but rather to be a man of Value'- **Albert Einstein**

I would like to put forth my deep sense of gratitude and tribute to a multifaceted, multidimensional with encouraging spirit, dignified, cultured personality Prof. B K Choudhury who stepped into library professional with strong vision and determination. A committed professional, he served both in the library and a teacher and earned fame. A thorough professional with extraordinary foresight and competencies both as a teacher and administrator, Prof. Choudhury remains unmatched to the date. A true value of excellence, resourceful and academician, Prof. Choudhury contributed immensely for the profession through his value added papers, books etc. and shared his knowledge for the sustainable growth of the profession. He proved himself a true Karamyogi by disseminating his expertise especially in the field of Cataloguing, Information Resource Management in various universities and other academic institutions in India. A scholar of versatile skills, his contemporaries often dumbstruck by his depth of incomparable knowledge encompassing diverse areas such as, Knowledge Management, Resource Description Analysis, Information Literacy etc. He is having imponderable human factors with aesthetic value and true citizen in the knowledge society with leadership quality. I feel proud to get such a vibrant personality with high potentiality and resourceful in every sphere and in my professional career.

Prof. Choudhury extensively moved various parts of India and shared his vision, knowledge and innumerable professionals implemented his ideas in the practical fields and gained success. His dynamic spirit and expertise in the field resulted to the production of many Ph.D.'s and some are in the pipeline. My personal regards to such a doyen in Indian Librarianship and hope him to remain so for all times to be dynamic and active in the professional activities. I pray God to bless him with good health and energy.

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A STUDENT SPEAKS … ON PROF. B.K. CHOUDHURY

Dr. Sanjaya Mishra
Director, Commonwealth Educational Media Centre for Asia, New Delhi, INDIA.
Email: smishra@col.org

It is a rare privilege for any student to write about his/her teacher. I am happy to have been considered worthy of writing about my teacher, who helped to learned technical writing. My days at the Sambalpur University are in front of me while writing this short piece. I was a student of Dr. Choudhury's first batch of many successful students from Sambalpur University, at that time he was finalising his doctoral work. Our cataloguing class that he taught was always lively and practical oriented. While he taught us the structure of cataloguing codes, and their differences, he also encouraged us to read more about the subject from various journals available in the Central Library. He would also show some of this research work to a few of the students that his eye had identified, and would encourage them to take up writing. Under his tutelage I did my first survey-based research on reading habits of university students, and then went on to do a critical analysis of the treatment of Government as author in the cataloguing codes. Both the papers were published by the time I joined the University of Delhi to study for my Master degree in Library and Information Science. Because of the lessons I learnt from him directly and indirectly through associations, I could write three more papers during my stay at the Sambalpur University campus. Those were the days that shaped my journey as an explorer to find new ways of learning, and thanks to Choudhury Sir – the way we call him fondly. As a humble human being and teacher par excellence, Choudhury Sir always loves his students and feels happy to see his student progress in life. I have seen his pride, when he tells others about the success stories of his students. He is a true teacher, who will take you home, offer food, and teach you what you need, and further encourage you to reach for what you want in life. My experiences and interactions with him during my days at the Sambalpur University and afterwards seem like a story from mythology. Finding such a teacher and simple down-to-earth human being is rare in today's world.

I am glad that a Festschrift volume is being published in his honour. This is the best way to honour a researcher and teacher, who has only spread happiness in the life of his students.

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REMEMBERING THE CONTRIBUTION OF PROF. B.K. CHOUDHURY

Dr. Bhaskar Mukherjee

I really feel honoured to be asked to write about Professor B.K. Choudhury, a multidimensional dynamic personality in the field of Library & Information Science. Although, I came in contact with Prof. Choudhury because of some academic reasons, on my first meeting at BHU, rather I was completely impressed by his simplicity. At the age of more than sixty, his commitment for the betterment of the student and profession develop a special space in my mind. This small write-up is a reflection of my gratitude to the great professor from my inner heart and mind too.

I had never run after for getting any personal glory and never approached anybody for me for any 'academic push'. I am immense pleasure and full satisfaction what I able to achieve till date and always feel fortunate to get ashirwad from my Maa-Baba. I received utmost respect from my students and it is my daily diet for my existence.

A person is known for his nature as human being. Recalling famous philosopher Plato that before being a professional we are human being first. On a fine morning I was surprised when Prof. Choudhury called me and identifies me as human being rather than for the professional reasons. I have never spent hours of time, hardly meet he anywhere other than through his learned writings; however on first talk it seems that I have a long association with him. I always felt that he has imbibed the qualities of a concerned teacher, who always thinks better for his students. He always encourages students for their betterment and shown right path for bright future.

Prof. Choudhury, a distinguished teacher of repute, a great advocate of library science education at Orissa, a staunch supporter of Ranganathan's philosophy, visiting fellow of number of universities in India, responsible for conducting hundred number of well-organized courses and conferences, born in 15th November 1948 in a small place Berhampur, Orissa. He has started his professional journey as Junior Librarian at Central Library of Orissa University of Agriculture & Technology in 1971 and completes his tenure as Visiting Professor of a UGC-DRS-SAP P.G. Department of Library & Information Science in 2012. During his 31 years of teaching and 28 years of research experience he has published nearly 100 high repute research works in LIS field which still have well read by academicians.

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